The significance of staffing and work environment for quality of care and the recruitment and retention of care workers. Perspectives from the Swiss Nursing Homes Human Resources Project (SHURP)

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List of Abbreviation

AGEK	Arbeitsgemeinschaft der Schweizerischen Forschungs- Ethikkommissionen für klinische Versuche
AOC	Affective organizational commitment
BERNCA-NH	Basel Extent of Rationing of Nursing Care - Nursing Home Version
BESA	BewohnerInnen Einstufungs- und Abrechnungssystem
BSN	Bachelor of Science in Nursing
CI	Confidence Interval
CNA	Certified nurse assistant
COBB	Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem ,Commitment' gegenüber der Organisation, dem Beruf/der Tätigkeit und der Beschäftigungsform
CVI	Content Validity Index
ERQ	Emotion Regulation Questionnaire
FTE	Full-time equivalent
GEE	Generalized estimation equations
HGLM	Hierarchical generalized linear models
HPSI	Health Professions Stress Inventory
I-CVI	Item Content Validity Index
ICC	Intraclass Correlation
IOM	Institute of Medicine
IQR	Interquartile range
LPN	Licensed practical nurse
MBI	Maslach Burnout Inventory
MOAQ	Michigan Organizational Assessment Questionnaire

MSN	Master of Science in Nursing
NA	nurse assistant / nurse aide
NH	Nursing home
OECD	Organization for Economic Co-operation and Development
OR	Odds Ratio
PES-NWI	Practice Environment Scale – Nursing Work Index
PLAISIR	Planification Informatisée des Soins Infirmiers Requis
RAI-NH	Resident Assessment Instrument – Nursing Home
RN	Registered nurse
S-CVI	Scale Content Validity Index
SAQ	Safety Attitude Questionnaire
SD	Standard deviation
SHURP	Swiss Nursing Home Human Resources Project
UTI	Urinary tract infection

Acknowledgements

Summary

While the demand for high quality of care in nursing homes is rising, recruiting and retaining qualified staff is becoming increasingly difficult. Burgeoning chronic illness rates, complex medical and psychosocial situations, and the rising challenge of mental health disorders such as dementia compound the problem. Current research shows a tendency for higher staffing levels to correlate with higher quality care; however, the results are inconclusive. Further, while work environment factors such as leadership and teamwork appear to play an important role for positive resident outcomes, few studies have closely examined combinations of staffing and work environment factors and their relationships with quality of care. In fact, very little is known about what happens at the actual interface between staff and resident when staffing or other resources are short and care workers have to leave certain activities undone. Such rationing of nursing care might play an important role concerning the quality of care provided.

One vital question for nursing homes is how much staff and what skill mix are needed to provide adequate quality of care in a given context. Another is how nursing homes can attract and retain healthcare workers who fit those needs. In a time of increasing workforce shortage, nursing homes might want to explore different recruitment venues such as employer referral. However, very little is known of contextual factors regarding care workers' recommendations of their workplace to potential hires. Similarly, affective organizational commitment is known to be inversely related with intention to leave; but little is known about work environment factors as antecedents of that commitment. It is possible that providing a positive work environment is a key to recruiting and retaining the workforce needed.

Thus, the overall aim of this dissertation is to comprehensively examine the association between nursing homes' staffing issues, their care workers' work environments, implicit rationing of nursing care and quality of care. It will also examine the relationship of

staffing and work environment with care workers' affective organizational commitment and their willingness to recommend their nursing home as an employer.

This dissertation is embedded in the Swiss Nursing Home Human Resources Project (SHURP), a cross-sectional study of Swiss nursing homes. SHURP was initiated to gain a comprehensive and in-depth understanding of how organizational characteristics, work environment, and implicit rationing of care are linked with care worker and resident outcomes in Swiss nursing homes. A representative sample of 163 nursing homes participated, i.e., a random 10% selection of Switzerland's approximately 1600 nursing homes. Of 6947 care workers invited to participate, 5323 responded (response rate of 76%). This sample was stratified according to language region (German-, French-, and Italian-speaking part of Switzerland) and nursing home size (large: ≥100 beds, medium: 50-99 beds, and small: 20-49 beds). SHURP had 5 main goals: 1) to describe characteristics of facilities, units, care workers, and residents, as well as of work environment, work stressors, and implicit rationing of nursing care; 2) to describe the prevalence of selected negative resident outcomes (e.g., falls, need for bedrails, pressure ulcers); 3) to describe the prevalence of selected care worker outcomes (e.g., job satisfaction, affective organizational commitment, intention to leave); 4) to compare staffing, skill mix, and quality of the work environment, considering care worker and resident outcomes, based on facility and unit characteristics; and 5) to explore facility and unit characteristics, work environment, work stressors, and implicit rationing of nursing care in relation to quality of care, along with resident and care worker outcomes. This dissertation focuses on the last of these aims, concentrating on three outcomes: care worker-reported quality of care, affective organizational commitment and prospective employee referrals.

This dissertation has 9 chapters. **Chapters 1 and 2** provide introductory information. **Chapter 1** gives an overall introduction to nursing home workforce research, with special emphasis on current workforce challenges, including an overview of the SHURP framework, focusing on work environment, implicit rationing of nursing care, quality of care, and

affective organizational commitment. Following this, **Chapter 2** describes the aims of this dissertation.

Chapter 3 comprises the published study protocol of SHURP. It gives a general introduction to the background, rationale and aims of the main study, its methodology and the development of the SHURP questionnaires. It also introduces the study's conceptual framework, which postulates that the interplay of organizational characteristics (e.g., nursing home size or profit status, unit staffing levels, staff mix, turnover) and work environment factors (e.g., leadership, teamwork, safety climate) can be linked to resident and care worker outcomes, although these relationships might be partly mediated by implicit rationing of nursing care. The framework is based on Mitchell's Quality of Health Outcomes Model, which further develops Donabedian's structure-process-outcome model, assuming dynamic rather than sequential relationships between the components and suggesting that relationships between interventions and outcomes are not direct but mediated by system and client characteristics. Additionally, SHURP is a continuation of the RN4Cast study, which stressed the importance of work environment factors concerning relationships between staffing and outcomes.

In **Chapters 4 through 6,** three articles focus on implicit rationing of nursing care. **Chapter 4** presents first evidence on the validity and reliability of the German, French, and Italian versions of the Basel Extent of Rationing of Nursing Care (BERNCA) instrument for nursing homes (BERNCA-NH). Like the other questionnaires used in the study, the BERNCA was first adapted to its use in the nursing home setting by fitting the content and simplifying the language, then assessed for content validity by a panel of 6 to 13 gerontological experts. Next, it was tested for comprehensibility and understandability in focus group interviews with end users of different educational backgrounds (e.g., registered nurses, nurse aides), then translated, back-translated and checked for agreement with the original scale. Finally, it was psychometrically tested. Each language version showed good validity and reliability. The

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content validity indexes for the four subscales found in this analysis were above 0.83–except for the Italian version of the scale on rationing of social care, which yielded a value of 0.78. Along with higher missing values in social care items, this rating indicated the need to revise this subscale. In contrast to the one-factor solution of the original BERNCA, exploratory factor analysis produced a consistent four-factor solution (subscales: 1. Support in activities of daily living; 2. Caring, rehabilitation, and monitoring; 3. Documentation; and 4. Social care) with good fit statistics and factor loadings above 0.5 in all language versions. Cronbach's Alpha was good throughout, ranging between 0.77 and 0.89. Evidence based on interscorer differences showed that the BERNCA-NH should be analyzed at the individual level and responses cannot be aggregated to the unit level (all r_{WG} were below 0.7 with skewed distribution assumed), but should be controlled for the nestedness of care workers within units (all ICC1>.05). Based on the analyses, though further refinements of selected items are needed, the German, French, and Italian BERNCA-NH versions are all valid and reliable for use in Swiss nursing homes.

Chapter 5 reports the results of a study describing levels and patterns of implicit rationing of nursing care in the SHURP sample and examining factors contributing to implicit rationing of nursing care, e.g., staffing level, turnover, and work environment. According to the 4307 care workers from 156 nursing homes included in this analysis of the SHURP sample, implicit rationing of nursing care was relatively rare. Within the four subscales of rationing, items concerning documentation and social care were rationed more often than items involving caring, rehabilitation, monitoring, or support in activities of daily living. In multilevel regression models using the four subscales of implicit rationing of nursing care as outcomes, staffing level and turnover were not related to any of the subscales. This could be because the relationship between staffing level and rationing is not linear, but that a minimal threshold is required, above which no relationship can be shown. On the other hand, more positive work environments, signaled by elevated levels of positive teamwork, safety climate,

and perceived adequacy of staffing and other resources, alongside comparatively low frequencies of work stressors, e.g., workload, workplace conflict and lack of recognition, showed significant relationships to lower levels of rationing. We suggest that implicit rationing of nursing care is a factor to be considered when talking about quality of care in nursing homes, and that interventions to improve the work environment should also be tested for their effect against rationing.

In **Chapter 6**, the level of care-worker-reported quality of care is examined, along with its relationships with staffing variables, work environment, work stressors, and implicit rationing of nursing care. Overall, the level of care quality reported was very high, with 93% of respondents giving positive ratings. As in the previous study, while neither staffing levels nor turnover were significant predictors of better quality of care, significant correlations were found with better teamwork and safety climate, less workload-related stress, and less implicit rationing either of social care or of care, rehabilitation, and monitoring. Therefore, interventions to improve the work environment, to support the handling of work stressors and to reduce rationing might help to promote high quality of care in nursing homes.

Chapters 7 and 8 present the two final articles, which focus on two outcomes of particular interest vis à vis personnel shortages: care workers' affective organizational commitment and their willingness to recommend their employers to potential colleagues.

The nursing home sector urgently needs to improve its recruitment and retention of adequately qualified care workers. **Chapter 7** focuses on affective organizational commitment (AOC), i.e., employees' emotional attachment to, identification with and involvement in their organization. Within the SHURP sample, it could be shown that higher AOC was significantly related to lower intention to leave, fewer health complaints, and lower levels of both presenteeism and absenteeism. As in the former studies, in addition to overall job satisfaction, higher AOC was significantly related to work environment factors including appropriate deployment of skills, better collaboration with colleagues, as well as the director

of nursing and the nursing home director, more supportive leadership, higher staffing and resource adequacy and better quality of care. Unlike in former studies, leadership was the most significant work environment factor, suggesting that interventions to strengthen supportive leadership and job satisfaction are the most promising to increase AOC and minimize intention to leave.

Presented in **Chapter 8,** the final article examines work environment factors and their relationship with employee recommendations, taking into account the mediating roles of affective organizational commitment and job satisfaction. Particularly during nursing personnel shortages, employee referral, i.e., word-of-mouth recommendations of one's own workplace to potential hires, is a promising method of attracting new employees. The results were very positive: 83% of surveyed care workers would recommend their nursing homes. Overall, the most important factors related to employee referral, fully mediating its relationship with inter-colleague collaboration, were affective organizational commitment and job satisfaction. However, supportive leadership and care quality also play important roles: the better the ratings of these factors, the more care workers would recommend their workplaces–a relationship only partially mediated by affective organizational commitment and job satisfaction. Confirming previous studies' findings, work environment factors played significant roles regarding personnel-related outcomes: here, nursing homes with higher work environment ratings, especially those with supportive leadership and the possibility to provide high quality of care, might also benefit from more employee referrals.

Chapter 9 discusses and synthesizes this dissertation's major findings. First, work environment factors prove to be key factors in outcomes research in nursing homes. Above a certain staffing threshold, the work environment, especially a positive teamwork and safety climate and an adequate workload, seems to make all the difference to achieve high quality of care. Second, rationing is negatively related to quality of care even at low frequencies, endangering a core function of long-term care: the possibility to offer person-centered care.

Third, the presence of a supportive leadership might be a key factor in the recruitment and retention of care workers. Reflections on the SHURP framework lead to recommendations for further studies with the possibility of using complexity science in a future framework. Additionally, along with a discussion of the strengths and limitations of the study, implications for research and practice are presented. By improving the current understanding of the work environment's relationships with quality of care, recruitment and retention of care workers, this dissertation contributed to the further development of nursing home outcome research.

Zusammenfassung

Während die Nachfrage nach guter Qualität in Pflegeinstitutionen zunimmt, zeigen diese verstärkt Schwierigkeiten qualifiziertes Personal zu rekrutieren und erhalten. Mit der höheren Rate an Bewohner/innen mit chronischen Erkrankungen, komplexen medizinischen und psychosozialen Situationen und psychiatrischen Problemen, insbesondere auch dementiellen Entwicklungen, steigt der Bedarf an qualifiziertem Personal, um eine adäquate Gesundheitsversorgung zu gewährleisten. Gemäss bisheriger Forschung besteht die Tendenz, dass ein höherer Personalstand mit besserer Pflegequalität zusammenhängt, aber die Ergebnisse sind noch unschlüssig. Arbeitsumgebungsfaktoren wie z. B. Führung oder Teamwork scheinen eine wichtige Rolle zu spielen für positive Bewohner/innenergebnisse. Bisher untersuchten jedoch nur wenige Studien in umfassender Weise die Kombination von Personalfaktoren und Arbeitsumgebung und deren Zusammenhang mit Pflegequalität. Zudem wissen wir wenig über das, was an der Schnittstelle zwischen Personal und Bewohner/innen geschieht, wenn zeitliche oder andere Ressourcen knapp sind und das Personal gewisse Aktivitäten weglassen muss. Diese sogenannte Rationierung von Pflege könnte eine wichtige Rolle spielen für die angebotene Pflegequalität.

Eine wichtige Frage für Pflegeinstitutionen ist, wie viel Personal in welchem Mix und in welchem Kontext notwendig ist um eine gute Pflegequalität zu bieten, eine andere Frage, wie eine Pflegeinstitution das benötigte qualifizierte Pflegepersonal anziehen und behalten kann. In Zeiten von zunehmender Personalknappheit möchten Pflegeinstitutionen eventuell andere Rekrutierungskanäle ausprobieren wie z. B. Mitarbeiterempfehlungen. Wir wissen jedoch noch sehr wenig über Kontextfaktoren, die begünstigen, dass Mitarbeitende ihren Arbeitsplatz weiterempfehlen. Gleicherweise ist bekannt, dass affektive organisationale Mitarbeiterbindung mit tieferer Kündigungsabsicht zusammenhängt, wir wissen jedoch wenig über Arbeitsumgebungsfaktoren, die die Mitarbeiterbindung begünstigen. Die Schaffung einer

positiven Arbeitsumgebung könnte ein Schlüssel sein für die Rekrutierung und Erhaltung des benötigten Personals.

Das Hauptziel dieser Dissertation ist daher, in umfassender Weise den Zusammenhang zwischen Personalfaktoren und der Arbeitsumgebungsqualität in Pflegeinstitutionen mit impliziter Rationierung von Pflege und Pflegequalität zu untersuchen. Zusätzlich wird untersucht, wie Personalfaktoren und Arbeitsumgebungsqualität mit der affektiven organisationalen Mitarbeiterbindung und der Bereitschaft des Personals zusammenhängen, die eigene Pflegeinstitution als Arbeitsplatz weiterzuempfehlen.

Die Dissertation ist im Swiss Nursing Homes Human Resources Project (SHURP) eingebettet, einer Querschnittstudie in Schweizer Pflegeinstitutionen. Der Zweck von SHURP war, ein umfassendes und vertiefendes Verständnis zu gewinnen über die verschiedenen Merkmale und Beziehungen von Organisationsfaktoren, Arbeitsumgebung und impliziter Rationierung von Pflege im Verhältnis zu Personal- und Bewohner/innenergebnissen in Schweizer Pflegeinstitutionen. Eine repräsentative Auswahl von 163 Pflegeinstitutionen nahm teil, die eine 10%-Stichprobe aus den ca. 1600 Schweizer Pflegeinstitutionen darstellen. Von 6947 Pflege- und Betreuungspersonen, die zur Teilnahme eingeladen wurden, haben 5323 geantwortet (Rücklaufquote: 76%). Die Stichprobe war nach Sprachregion (deutsche, französische und italienische Schweiz) und Heimgrösse (gross: ≥100 Betten, mittel: 50-99 Betten, klein: 20-49 Betten) stratifiziert. Die Hauptziele von SHURP waren 1) Beschreibung von Merkmalen der Institutionen und Abteilungen, des Pflege- und Betreuungspersonals, der Bewohner/innen, sowie der Arbeitsumgebung, Arbeitsstressoren und impliziter Rationierung von Pflege; 2) Beschreibung der Prävalenz von Bewohner/innenergebnissen (z. B. Stürze, Bettgitter, Dekubitus); 3) Beschreibung der Prävalenz von Personalergebnissen (z. B. Arbeitszufriedenheit, affektive organisationale Mitarbeiterbindung, Kündigungsabsicht); 4) Vergleich von Personalstand, Skill mix, Arbeitsumgebungsqualität und Personal- und Bewohner/innenergebnissen unter Institutionen und Abteilungen; und 5) Untersuchung von

Zusammenhängen zwischen Merkmalen von Institutionen und Abteilungen, Arbeitsumgebung, Arbeitsstressoren und impliziter Rationierung von Pflege mit Pflegequalität, sowie Personal- und Bewohner/innenergebnissen. Diese Dissertation fokussiert das letzte Ziel, insbesondere die vom Personal eingeschätzte Pflegequalität und die beiden Personalergebnisse affektive organisationale Mitarbeiterbindung und Mitarbeiterempfehlung.

Die Dissertation umfasst 9 Kapitel. Nach zwei einführenden Kapiteln (**Kapitel 1 und 2**) wird das SHURP Studienprotokoll vorgestellt (**Kapitel 3**) und Resultat von 5 Studien werden beschrieben und diskutiert. Drei Artikel konzentrieren sich auf implizite Rationierung von Pflege: eine psychometrische Untersuchung der BERNCA-NH, sowie der Zusammenhang von Kontextfaktoren mit Rationierung und deren Zusammenhang mit Pflegequalität (**Kapitel 4 bis 6**). Die beiden letzten Artikel fokussieren affektive organisational Mitarbeiterbindung und die Bereitschaft den eigenen Betrieb möglichen Kolleg/innen zu empfehlen (**Kapitel 7 und 8**), zwei wichtige Ergebnisse in Zeiten von Personalknappheit. Abschliessend werden zentrale Erkenntnisse präsentiert, Stärken und Schwächen der Arbeit diskutiert und Empfehlungen für Forschung und Praxis abgegeben (**Kapitel 9**).

Im **Kapitel 1** wird eine allgemeine Einführung in die Arbeitskräfteforschung in Pflegeinstitutionen gegeben mit spezieller Betonung auf die aktuellen Herausforderungen, sowie eine Einführung in den konzeptuellen Rahmen von SHURP und seine zentralen Elemente, insbesondere die Arbeitsumgebung, implizite Rationierung von Pflege, Pflegequalität und affektive organisationale Mitarbeiterbindung. **Kapitel 2** beschreibt die Ziele dieser Dissertation. **Kapitel 3** beinhaltet das publizierte Studienprotokoll von SHURP. Es gibt eine generelle Einführung in den Hintergrund, Begründung für und Ziele der Hauptstudie, ihre Methodologie und eine Beschreibung der Entwicklung der SHURP-Fragebogen. Es führt in den konzeptuellen Rahmen von SHURP ein, welcher postuliert dass das Zusammenspiel von Organisationsmerkmalen wie z. B. Heimgrösse, Rechtsstatus,

Personalstand und –mix oder Personalfluktuation und Arbeitsumgebungsfaktoren (z. B. Führung, Teamwork, Sicherheitsklima) zusammenhängen mit Personal- und Bewohner/innenergebnissen. Dieser Zusammenhang könnte teilweise vermittelt werden durch implizite Rationierung von Pflege. Der konzeptuelle Rahmen basiert auf Mitchells Quality of Health Outcomes Model, welches Donabedians Struktur-Proess-Ergebnis-Model weiterführt. Es geht von dynamischen anstatt sequentiellen Beziehungen zwischen den Komponenten aus und postuliert, dass der Zusammenhang zwischen Interventionen und Ergebnissen nicht direkt ist, sondern vermittelt wird durch Merkmale des Systems und der Klienten. Ausserdem ist SHURP eine Fortsetzung der RN4Cast Studie, welche die Wichtigkeit betont Arbeitsumgebungsfaktoren zu berücksichtigen wenn der Zusammenhang von Personalfaktoren und Ergebnissen untersucht wird.

In **Kapitel 4** wird erste Evidenz für die Validität und Reliabilität der deutschen, französischen und italienischen Version der BERNCA-NH präsentiert. Wie andere Instrumente, die in SHURP verwendet wurden, wurde das Originalinstrument in einem ersten Schritt für den Gebrauch in Pflegeinstitutionen adaptiert durch eine Anpassung des Inhaltes und Vereinfachung der Sprache und danach wurde die Inhaltsvalidität durch eine Gruppe von 6 bis 13 gerontologischen Expert/innen überprüft. In einem nächsten Schritt wurde das Instrument auf seine Verständlichkeit überprüft in Fokusgruppeninterviews mit Endnutzern mit unterschiedlichen beruflichen Hintergründen (z.B. Pflegefachpersonal, Pflegehilfen), dann übersetzt, zurückübersetzt und seine Übereinstimmung mit dem ursprünglichen Instrument überprüft. Schlussendlich wurde es psychometrisch überprüft. In jeder Sprachversion zeigte die BERNCA-NH gute Evidenz für ihre Validität und Reliabilität. Die Inhaltsvaliditätsindexe für die vier in der Faktoranalyse gefundenen Subskalen waren über 0.83 ausser dem Index der italienischen Subskala zur Rationierung von sozialen Aktivitäten mit einem Wert von 0.78. Zusammen mit der höheren Anzahl fehlender Werte in Fragen zu sozialen Aktivitäten zeigt dies den Bedarf diese Skala zu revidieren. Im Gegensatz zu der Ein-Faktor-Lösung des

Originalinstrumentes zeigte eine explorative Faktoranalyse eine konsistente Vier-Faktor-Lösung in der BERNCA-NH mit guter Fit-Statistik und Faktorladungen über 0.5 in allen Sprachversionen (4 Subskalen: 1. Unterstützung in den Aktivitäten des täglichen Lebens; 2. Caring, Rehabilitation und Überwachung; 3. Dokumentation; und 4. Soziale Aktivitäten). Cronbach's Alpha bewegte sich zwischen 0.77 und 0.89 für die vier Subskalen. Die Evidenz bezüglich Interscorer Unterschieden zeigte, dass die BERNCA-NH auf der individuellen Ebene analysiert werden sollte und die Antworten nicht auf die Abteilungsebene aggregiert werden können (alle r_{WG} waren unter 0.7 unter Annahme einer schiefen Verteilung). Hingegen sollten die Antworten kontrolliert werden in Bezug auf die Verschachtelung des Personals auf Abteilungen (alle ICC1>.05). Auf Grund der Analyse scheinen die drei Sprachversionen der BERNCA-NH valide und reliable Instrumente für den Gebrauch in Schweizer Pflegeinstitutionen zu sein, obwohl einzelne Items eine weitere Überarbeitung benötigen.

Kapitel 5 berichtet über die Resultate einer Studie, die die Häufigkeit und Muster von impliziter Rationierung der Pflege in SHURP beschreibt und beeinflussende Faktoren untersucht, wie z. B. Personalstand, Personalfluktuation und Arbeitsumgebung. Gemäss den 4307 Pflege- und Betreuungspersonen von den in dieser Analyse eingeschlossenen 156 Pflegeinstitutionen kam implizite Rationierung von Pflege selten vor. Unter den 4 Subskalen der Rationierung, Tätigkeiten im Bereich der Dokumentation und von sozialen Aktivitäten wurden häufiger rationiert als Tätigkeiten im Bereich Caring, Rehabilitation und Überwachung oder in der Unterstützung von Aktivitäten des täglichen Lebens. In einem Mehrebenen-Regressionsmodell mit den vier Subskalen der Rationierung als Outcomes hingen weder der Personalstand noch die Personalfluktuation mit einer der Subskalen zusammen. Dies könnte damit zu tun haben, dass der Zusammenhang zwischen Personalstand und Rationierung nicht linear ist, sondern dass es eine minimale Schwelle gibt über der es nicht möglich ist, einen Zusammenhang aufzuzeigen. Auf der anderen Seite hingen

Arbeitsumgebungsfaktoren signifikant mit weniger Rationierung zusammen, wie z. B. positives Teamwork und Sicherheitsklima, die Wahrnehmung von besseren Personalressourcen und weniger häufigen Arbeitsstressoren (hohe Arbeitslast, Konflikte bei der Arbeit und fehlende Anerkennung). Wir stellen fest, dass implizite Rationierung von Pflege ein wichtiger Faktor zum Beachten ist, wenn über Pflegequalität gesprochen wird und dass Interventionen zur Verbesserung der Arbeitsumgebung erprobt werden sollten bezüglich ihres Effekts Rationierung zu reduzieren.

Im **Kapitel 6** wird das Niveau der vom Pflegepersonal eingeschätzten Pflegequalität beschrieben und deren Zusammenhang mit Personalfaktoren, der Arbeitsumgebung, Arbeitsstressoren und impliziter Rationierung der Pflege. Über alles gesehen war das Niveau der Pflegequalität sehr hoch mit 93% der Antwortenden, die die Pflegequalität auf ihrer Abteilung als eher gut oder sehr gut einschätzten. Wie in der vorherigen Studie waren weder der Personalstand noch die Personalfluktuation signifikante Prädiktoren einer besseren Pflegequalität, währendem Arbeitsumgebungsfaktoren signifikant waren, insbesondere besseres Teamwork und Sicherheitsklima, weniger Stress auf Grund von Arbeitslast, weniger implizite Rationierung von Caring, Rehabilitation und Überwachung und von sozialen Aktivtäten. Interventionen zur Verbesserung der Arbeitsumgebung, zum besseren Umgang mit Arbeitsstressoren und zur Reduktion von Rationierung könnten helfen, die Pflegequalität in Pflegeinstitutionen zu verbessern.

Ein dringlicher Bedarf im Pflegeheimsektor ist die Rekrutierung und Erhaltung von genügend Personal, insbesondere Fachpersonal, zur Deckung des Pflegebedarfs. **Kapitel 7** fokussiert die affektive organisationale Mitarbeiterbindung, eine emotionale Bindung, Identifikation und Involvierung mit der Organisation. Es konnte in der SHURP Stichprobe gezeigt werden, dass eine höhere Mitarbeiterbindung signifikant mit einer tieferen Kündigungsabsicht, weniger Gesundheitsbeschwerden, Präsentismus und Absentismus zusammenhängt. Wie in den vorherigen Studien hingen Arbeitsumgebungsfaktoren, wie z. B.

weniger Stress durch fehlenden Einsatz vorhandener Fähigkeiten, bessere Zusammenarbeit mit Kolleg/innen, der Pflegedienstleitung, und der Heimleitung, bessere Führung, bessere Personalressourcen und bessere Pflegequalität signifikant mit einer höheren Mitarbeiterbindung zusammen, ebenso wie eine höhere Arbeitszufriedenheit. Im Unterschied zu den vorherigen Studien war die Führung der signifikanteste Arbeitsumgebungsfaktor: Interventionen zur Stärkung einer unterstützenden Führung und Erhöhung der Arbeitszufriedenheit könnten daher am vielversprechendsten sein um die Mitarbeiterbindung zu erhöhen und die Kündigungsabsicht zu minimieren.

Der letzte Artikel beschrieben in **Kapitel 8** untersucht den Zusammenhang von Arbeitsumgebungsfaktoren mit Mitarbeiterempfehlungen unter Berücksichtigung der vermittelnden Rolle von affektiver organisationaler Mitarbeiterbindung und Arbeitszufriedenheit. Mitarbeiterempfehlungen sind ein erfolgsversprechender Weg um in Zeiten der Personalknappheit neue Mitarbeitende anzuziehen. Sie beziehen sich auf die Mund-zu-Mund-Empfehlungen von Mitarbeitenden an aussenstehende Personen, mit denen der eigene Arbeitsplatz potentiellen Mitarbeitenden empfohlen wird. Ein übers Ganze gesehen hoher Prozentsatz von 83% des Pflege- und Betreuungspersonals würden ihre Pflegeinstitution empfehlen. Eine hohe Mitarbeiterbindung und Arbeitszufriedenheit waren die wichtigsten Faktoren, die mit einer Mitarbeiterempfehlung zusammenhingen, und die beiden vermittelten vollständig den Zusammenhang zwischen der Zusammenarbeit mit Kolleg/innen und Mitarbeiterempfehlung. Die Wahrnehmung einer unterstützenden Führung und die Möglichkeit gute Pflegequalität zu erbringen hingen jedoch ebenfalls mit Mitarbeiterempfehlungen zusammen. Affektive organisationale Bindung und Arbeitszufriedenheit vermittelten diesen Zusammenhang nur partiell. Wie in den vorherigen Studien spielten Arbeitsumgebungsfaktoren eine signifikante Rolle für bessere Ergebnisse. Hier zeigte sich, dass Pflegeinstitutionen mit einer besseren Arbeitsumgebung, insbesondere

einer unterstützenden Führung und der Möglichkeit eine gute Pflegequalität zu erbringen, auch von mehr Mitarbeiterempfehlungen profitieren.

Kapitel 9 macht eine Synthese und diskutiert die wichtigsten Befunde dieser Dissertation, wie z. B. die Wichtigkeit der Arbeitsumgebung für die Ergebnisforschung in Pflegeinstitutionen oder der Gewinn einer Messung von impliziter Rationierung. Der konzeptuelle Rahmen von SHURP wird reflektiert und Empfehlungen für dessen Anpassung gemacht. Stärken und Schwächen der Dissertation werden diskutiert und Empfehlungen für Forschung und Praxis abgegeben. Diese Dissertation half ein umfassenderes Verständnis über den Zusammenhang von Personalfaktoren, Arbeitsumgebung und Pflegequalität sowie der Rekrutierung und Erhaltung von Pflege- und Betreuungspersonal zu gewinnen und trug zur weiteren Entwicklung der Ergebnisforschung in Pflegeinstitutionen bei.

CHAPTER 1

INTRODUCTION

In Switzerland, more than 1550 nursing homes care for roughly 91'000 older people in need of permanent care due to disabilities, functional limitations, and/or cognitive decline [1]. In addition to long-term care, they offer a variety of services, including day and night care centers, geriatric rehabilitation, or palliative care [1, 2]. With a median facility size of 59 beds, Swiss nursing homes offer employment for approximately 120'000 persons (ca. 84'400 full-time equivalent posts) [1].

Workforce issues are challenging nursing homes in Switzerland as well as worldwide, while the demand for long-term care is increasing due to demographic changes [3-6]. With improved health care, longer life expectancy, and increasing numbers of people living with chronic diseases, shortages are projected in the nursing workforce. This shortage is sharpened by the ageing of the nursing workforce, many members of which are reaching retirement age, and by high turnover in nursing homes. Additionally, in order to increase the supply of services and reduce the costs, the workforce is diluted by the delegation of nursing tasks to less qualified care workers [7].

This combination of decreasing supply, increasing demand, and the thinning of skill mixes poses a great long-term threat to the quality of nursing home care. In this context, two questions are highly relevant for nursing homes: How is it possible to provide high quality care with the financial resources and workforce available, and what factors contribute to nursing homes' ability to recruit and retain qualified workers?

1.1. Workforce challenges

1.1.1. Increasing demands

In Switzerland, an ageing population and growing rates of chronic disease mean that the population of older people in need of daily care will increase by an estimated 40% by 2030 over the figures in 2000 [8], while projected care days in institutions for older people will increase by 30% to 41% [9]. Similar projections can be shown for other countries: in

more than 20 OECD-countries, advances in medical care and better access to health care have extended life expectancy past 80 years [7]. This has increased the need for nursing home places, especially in relation to the rising challenge of mental health problems such as dementia [10] and the shortening of hospital stays, with a shift of more acute and transitional care, as well as geriatric rehabilitation, to nursing homes [5, 11]. In spite of the tendency of care-dependent older persons to stay at home as long as possible and the development of alternative care models to avoid or delay nursing home placement [5], the simple increase in numbers of older persons is leading to an increasing demand for nursing home care.

1.1.2. Workforce shortage

Nursing homes are already severely challenged to recruit and retain enough qualified care workers to meet the increasing demand [12]. The projected workforce shortage is based on the needs both to fill new positions and to replace retirees. As with the rest of the workforce, healthcare workers are aging, and retiring care workers need to be replaced from a dwindling recruitment pool [3, 13]. With Swiss nursing home employees older than their counterparts in acute-care facilities, up to 47% will need to be replaced by 2030 [3]. In the US, 19% and 21% increases are projected, respectively, in jobs for registered nurses (RN) and for nursing assistants (NA) between 2012 and 2022. There, increasing demand and age-related attrition will create 830'000 additional jobs in healthcare services including nursing homes [14].

Based on these developments, nursing homes can anticipate increasing difficulty to attract new employees [15], especially qualified nurses. In the US, 91% of nursing homes report not having sufficient staff to provide basic care [16]. In Switzerland, 92% of nursing homes report difficulties in recruiting RNs [17]. One major problem is the unappealing image of careers in long-term care. Ageism in society, stereotypical portrayals of nursing homes, negative perceptions of geriatric care, and sensational media coverage bias the public's as well as nurses' opinions of long-term care institutions [6, 18, 19]. Unattractive working

conditions with high workloads, physically and emotionally demanding work, and high paperwork burdens add to the difficulty of finding new employees [15, 20, 21].

Not only is the recruitment of qualified care workers in a highly competitive market an issue, but also the retention of those workers. US nursing homes have a turnover rate between 40% and more than 100% per year [5, 22, 23]. In Switzerland, the situation is less severe, but far from ideal. A 2002 Swiss survey showed that 45% of RNs in nursing homes intended to leave the profession [24]. The cost of turnover is compounded by the loss of long-term practical experience, which even fully qualified new hires generally lack. Additionally, the training of new workers demands resources, and frequent staff changes weaken the long-term relationships between care workers and residents. All of these issues negatively affect residents' quality of care and quality of life [22, 25-28].

Several factors are significantly related to voluntary turnover, especially lower job satisfaction and organizational commitment among care workers, work environment aspects such as lack of respect, recognition, supportive leadership, or teamwork, and high workload [29-35]. High turnover rates can lead to a vicious cycle: by increasing the workload of the remaining staff, it increases job dissatisfaction and burnout, leading to further turnover. Even financially, the cost of turnover in nursing homes goes far beyond what the institutions pay. In the US, assuming a turnover rate of 45% per annum and an average cost of $3'500 per care worker, nursing home personnel losses cost taxpayers $2.5 billion per year [36]. No comparable calculation was available for Europe or Switzerland. Still, both low attraction and high turnover demand strategies to effectively recruit and retain the nursing home workforce.

One possible additional consequence of the workforce shortage is the dilution of the workforce, with minimally trained care workers allocated RN-level tasks to maintain basic care services. While 30% of Swiss health care personnel work in nursing homes, only 14% of those with tertiary level education (RNs with diploma education or higher) are employed there [3]. I.e., the majority of care workers in Swiss nursing homes have shorter educations

(licensed practical nurses (LPN) with 3-4 years' education, and NAs with 1-2 years' education or training on the job). Still, in comparison to other OECD-countries, Switzerland has one of the highest proportions of RNs as a percentage of long-term care workers [7]. However, although residents' overall care dependency and the complexity of their medical and psycho-social conditions are increasing, financial constraints and a shortage of available qualified personnel draw employers to incrementally reduce their overall skill mixes [37].

Moreover, roughly 60% of Swiss nursing home residents have some level of dementia, [38, 39] requiring specialized care models at the intersection of extramural, ambulatory and stationary long-term care. By increasing the amount of nursing time needed per resident, heavier psychosocial needs increase the demands on the remaining qualified staff, with as-yet undetermined effects on the quality of care.

1.1.3. Staffing level, staff mix, and quality of care

Workforce issues such as low staffing levels, high turnover or inadequate staff mix and their relationship with quality of care have been broadly researched in nursing homes [40-42]. Still, despite an overall tendency of finding an association of higher staffing volumes with higher quality of care, empirical results remain inconclusive. This lack of concrete findings relates largely to methodological limitations. To date, most research on staffing/care quality relationships has been cross-sectional, with few studies applying more resource-intensive longitudinal designs; and despite clear evidence that staffing-quality relationships are non-linear, many researchers persist in using linear models to describe them [42, 43]. Additionally, some studies posit that, rather than examining single factors, it is a combination of workforce characteristics, e.g., high staffing levels, low turnover, minimal use of temporary staff, and professional staff mixes [22, 26, 44, 45] that decide about the quality of care offered in nursing homes. Another limitation is that, as most studies take place in the USA, the particularities of the American health system, policy, and health personnel education make it difficult to generalize findings internationally [42]. Moreover, a growing body of literature

indicates that intangible but modifiable characteristics of the work environment, such as leadership or teamwork, significantly affect quality of care both in hospitals [46-48] and nursing homes [49-58]. Therefore, these characteristics require further consideration when examining the relationship between workforce characteristics and quality of care.

1.2.   The SHURP study and its conceptual framework

The Swiss Nursing Homes Human Resources Project (SHURP) was a health workforce study extension of the RN4Cast study[1], comprehensively examining the relationship of organizational factors–including workforce aspects–and work environment with both care worker and nursing home resident outcomes. A cross-sectional, national nursing home study, SHURP ran from 2011 to 2013, using 163 randomly selected nursing homes, stratified according to language region (German, French, or Italian) and nursing home size (small: 20-49 beds, medium: 50-99 beds, large: 100 and more beds). Participants included 5323 care workers with a full range of educational backgrounds (RNs or higher (BSN, MSN) with 3 or more years' education, LPNs with 3-4 years' education, certified nurse assistants (CNA) with 1-2 years' education or NAs trained on the job).

Chapter 3 describes the SHURP study protocol, providing the background, conceptual framework and overall aims of the study, as well as details regarding setting, sampling, variables, questionnaire development, data collection and management.

Several models guided the development of the SHURP conceptual framework (Figure 1).

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[1] The RN4CAST (Nurse Forecasting: Human Resources Planning in Nursing) project is the most comprehensive global study on the nursing workforce in hospitals. As a 3-year international multi-centre study (2009-2011), funded by the EU's 7th Framework Programme, RN4CAST focused on the nursing work environment and the deployment of nursing staff, and on their connections with nursing quality and patient outcomes. In 12 European countries, more than 480 hospitals participated, with more than 33,000 nurses and 11'000 patients surveyed (www.rn4cast.eu). The University of Basel's Institute of Nursing Science conducted the Swiss study segment, with 35 hospitals across the country's' three language regions, including more than 1,600 registered nurses and more than 900 patients from 140 randomly selected medical and surgical hospital units.
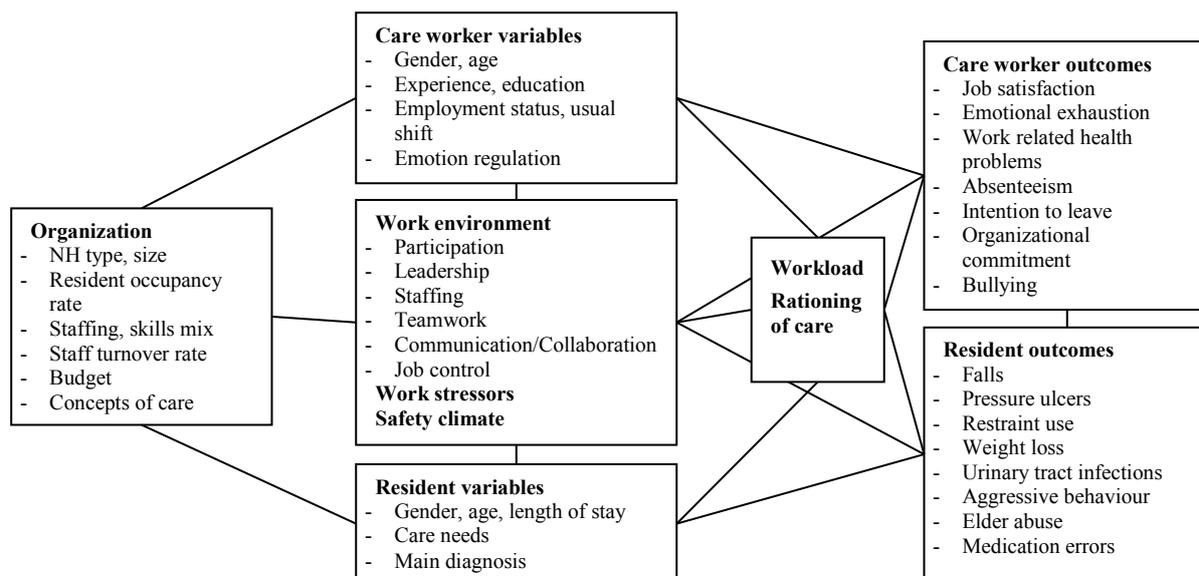
Figure 1: *SHURP conceptual framework*

The basic structure of the SHURP conceptual framework is derived from Donabedian's structure-process-outcome model [59], which postulates that, if a linkage has been shown where good structure increases the likelihood of good processes, which in turn increase the likelihood of good outcomes, healthcare quality can be assessed against these three values. Though the main interest is outcomes, e.g., overall quality of care in nursing homes, gaging where to intervene to improve those outcomes requires a knowledge of which structures (e.g., workforce (staffing level, staff mix) or work environment) and processes (e.g., implicit rationing of nursing care) affect them [59]. To this purpose, the Quality of Health Outcomes Model [60, 61] is an extension of Donabedian's perspective, but moves away from an essentially sequential model to postulate dynamic reciprocal relationships between its four factors (i.e., system, patient, interventions, and outcomes). In our framework, then, not only do staffing factors affect the work environment, the work environment also affects staffing factors, e.g., poor teamwork might increase turnover, which in turn increases workload, leading to more turnover.

Another aspect of the Quality of Health Outcomes Model integrated in the SHURP framework is the idea that it is the combination of structure and care processes, together with resident characteristics–our framework also includes care worker characteristics–that affect outcomes (a divergence from Donabedian's model, whereby structure affects outcomes only via process factors). Further, rejecting Mitchell's position that the effect of interventions on outcomes is fully mediated by patient and system factors [62], we postulate that interventions (i.e., process factors) have both direct and indirect effects on outcomes. Finally, we follow Mitchell's recommendation to use the framework as a basis for multilevel analyses of system, context, and individual factors [61, 62].

In the context of the workforce shortage described above, the framework's central purpose was to trace the relationships of workforce issues, e.g., staffing level, staff mix, and turnover, with both quality of care and care worker outcomes. The framework acknowledges that this relationship is complex. To improve quality of care, for example it is not enough simply to increase staffing levels. The relationship depends on the context, e.g., whether it involves organizational, care worker, or resident characteristics, as well as work environment contributors such as leadership, teamwork, work stressors, or safety climate. For example, staffing factors and work environment constitute the context in which care-related processes take place. One of these processes is implicit rationing of nursing care–i.e., the omission of care activities due to time constraints or other resource shortfalls–which might partly mediate the effect of structural elements on the quality of care. Thus, based on the framework, SHURP addresses two limitations of previous nursing home workforce research: it combines different workforce aspects (including work environment factors) and includes a process element (implicit rationing of nursing care).

1.3. Work environment

Factors of the work environment, i.e., ''the organizational characteristics of a work setting that facilitate or constrain professional nursing practice'' [63, p. 178], have repeatedly been linked to aspects of quality of care in nursing homes [49, 64]. The importance of staffing and work environment for positive nurse and patient outcomes is a defining element of the Magnet© recognition program. Based on observations in the 1980ies that, even in times of labor shortages, some hospitals were able to attract and retain top-quality nurses, such hospitals were characterized as magnet institutions. In addition to low turnover, magnet hospitals showed excellent patient outcomes [65-68]. Other common characteristics included supportive leadership, clinically competent teams, nurse autonomy and accountability, adequate nurse staffing, collegial nurse-physician relationships and communication, support for education, and a philosophy of care where concern for the patient was paramount [48, 69]. So striking were the outcomes that the US Institute of Medicine (IOM) [70] recognized the cultivation of such nurse work environments as a key development in patient safety.

Also, though the discussion of magnet organizations began in the acute care setting, focusing initially on RNs, it now reflects a broad range of important aspects of nursing home care. In 2010, to recognize and encourage outstanding work environments in nursing homes, the American Nurses Credentialing Center (ANCC) launched the Pathway to Excellence in Long Term Care® Program.

Nursing homes differ in numerous ways from acute care settings, many of which are not immediately obvious. For example, in addition to different mixes of RNs, LPNs, and NAs and a focus on long-term relationships with residents, nursing homes have to provide not only high quality of care but also long-term social care for a higher quality of life. Moreover, they have distinct methods of collaboration with physicians and allied health care personnel, and distinct reimbursement systems.

However, the research of nursing home work environments covers themes very similar to those studied in magnet hospital research. Better leadership and management practices have been related to better resident outcomes, e.g., fewer pressure ulcers, less aggressive behavior or restraint use, and overall higher quality of life [49-55]. Similarly, better teamwork and communication have been linked with higher quality of care and quality of life, including less pain [55-58]. Care workers' participation in decision-making i.e., structural empowerment, has been associated both with significantly fewer negative staff-resident interactions [71], higher residents' social engagement [25], and with care workers' ability to provide individualized care [72].

Conversely, work stressors remain an important part of the nursing home work environment, among them arduous workloads, time pressure, lack of personnel, heavy physical labor, handling of "difficult" residents, and perceived lack of respect or professional prestige [73-75]. These stressors have far-reaching ramifications. Care workers' time pressure, for example, has been linked to lower resident quality of life [76], higher anti-anxiety or hypnotic drug use, elevated prevalence of pressure ulcers [77], and increased behavioral symptoms among residents [78].

Several studies have shown that, while work environment factors were significantly related to resident outcomes, no such relationship could be shown for either staffing level or staff mix in the same study [49, 53]. This provides first evidence for combining both workforce aspects and work environment when examining predictors for nursing home quality of care. Overall, though, knowledge of nursing home work environments remains limited, as previous studies often focused individually on elements of the work environment now known to be interrelated and best examined in combination [54]. Moreover, many of these studies used rather small sample sizes and did not explicitly examine the interactions and effects of workforce factors.

1.4.   Safety climate

In addition, the SHURP framework included safety climate. A beneficial safety climate distinguishes itself through a system approach to human error, focusing on the conditions under which errors occur rather than blaming individuals for mistakes [79-81]. Hospital studies suggest that safety climate quality correlates with fewer reported medication errors, patient falls, hospital-acquired infections, and hospital readmissions [82-86]. In the nursing home context, though, data remain limited. For example, more favorable safety climate has been significantly associated with increased reporting of falls and less restraint use [87, 88], but not with pressure ulcer prevalence [87].

1.5.   Implicit rationing of nursing care

One possible consequence of the combination of increasing demand for care worker time and a workforce shortage is implicit rationing of nursing care. Lacking time and resources forces care workers not only to prioritize care but to actually either to omit necessary tasks or to perform them with lower quality or incompletely. Schubert et al. [89] defined such rationing of nursing care in the acute care sector as "the withholding of or failure to carry out necessary nursing measures for patients due to a lack of nursing resources (staffing, skill mix, time)".

As shown in a recent review [90], several conceptual definitions are related to implicit rationing of nursing care, e.g., missed care, omitted care, or care left undone, which the authors summarize under the umbrella term of unfinished care. Schubert et al. [91] developed the Basel Extent of Rationing of Nursing Care (BERNCA) instrument to measure the frequency of implicit rationing. In SHURP, we adapted this instrument to the nursing home sector.

Chapter 4 provides initial evidence of the validity and reliability of the nursing home version of the Basel Extent of Rationing of Nursing Care (BERNCA-NH) instrument in German, French, and Italian. Various lines of evidence, based on test content, response processes, internal structure, inter-item inconsistency and interscorer differences, were explored, confirming the usability of all versions, though further refinements were advised based on lower content validity and higher missing values in items on social care, and the absence of items on the rationing of treatments (e.g., medication).

Evidence on implicit rationing of nursing care in nursing homes – its frequency, influencing factors, and outcomes – remains limited. Several studies have shown that, under time constraints, care workers in long-term care give priority to treatment and diagnostics and ensure feeding and elimination functions, but cut time from emotional support, mobilization, and monitoring [73, 92, 93]. While they ration activities over which they have decisional autonomy, they do not immediately compromise residents' safety [92]. Under time constraint, less urgent needs such as communication, rehabilitation, and physical activity are either omitted or hurried, and silent psychiatric problems might go unnoticed [94]. According to Bowers et al. [95], when nurses had to work faster, they omitted surveillance and follow-up tasks that would have uncovered small problems and prevented escalation, therewith compromising residents' integral safety, functional ability and quality of life in the long run. Also, residents who show resistive behavior, who have a higher physical dependence and require two care workers for transfer, or who cannot speak up for themselves and have no-one to advocate for them might be exposed more frequently to rationing [93, 96, 97].

As noted above, according to SHURP's framework, rationing depends on the context in which care is provided. Supporting this premise, a recent review on rationing in acute care related organizational factors, patient and nurse characteristics, and, most significantly, work environment characteristics–especially resource adequacy, teamwork, leadership, and safety climate–to the frequency of rationing [90]. No studies have yet examined these relationships in the nursing home sector.

Chapter 5 reports findings regarding self-reported rationing of nursing care in nursing homes, its levels and patterns, and its relationships with staffing and work environment characteristics. The results indicate a low level of rationing, with priority given to support in activities of daily living over documentation of care and social care. While perceptions of lower staffing resources, poor teamwork and safety climate and more pronounced work stressors were significantly related to rationing, unit staffing levels and turnover were not.

Hospital studies have shown significant relationships between rationing of nursing care and patient satisfaction, overall quality of care, falls, pressure ulcers, nosocomial infections, critical incidents, medication errors, and mortality rates [98-106]. While nursing home evidence remains scarce, a recent study in a New Jersey nursing home significantly related missed care–specifically, the failure to administer medications on time and to provide adequate patient surveillance–with the prevalence of urinary tract infections (UTIs) [107]. However, this study did not consider work environment characteristics and was based on a survey of a mean of 5.5 RNs per nursing home.

Chapter 6 reports findings concerning relationships of staffing variables, work environment, work stressors and implicit rationing of nursing care with care worker-reported quality of care. Only 7% of care workers rated the quality of care provided as rather low or very low. In addition to several work environment factors, e.g., higher teamwork and safety climate ratings, better resource adequacy and less work stress due to workload, significant predictors of better quality of care included less rationing of caring, rehabilitation, and monitoring and social care. At the same time, no relationship was indicated between quality of care and leadership, staffing levels, staff mix, or turnover.

1.6. Recruitment and retention of care workers

Considering the difficulty of finding qualified healthcare employees, it is of vital interest to nursing homes to retain their skilled workforce. It has repeatedly been shown that employees who show affective organizational commitment (AOC) are less prone to turnover [108-110]. AOC denotes "emotional attachment to, identification with, and involvement in...[one's] organization" [111]. The more commitment employees feel to their organization,

the better their performance, motivation, and satisfaction, and the more they want to stay. In the current period of workforce shortage, AOC is thus a key concept. A clearer understanding of its antecedents in nursing homes might support policy makers and nursing home management to increase commitment and reduce turnover via targeted interventions.

Magnet hospital research indicated that improving the work environment was an effective strategy both to fill open nursing positions and to retain care personnel. Key work environment aspects isolated in magnet hospitals were similar to those found to favor AOC in nursing homes: better leadership and supervisory support [112, 113], manageable workload [110, 114], and job autonomy [115]. However, no comprehensive study of AOC antecedents has yet been performed for nursing homes.

Chapter 7 presents a study exploring affective organizational commitment (AOC) levels and their relationships with facility and care worker characteristics, work environment, and quality of care, as well as with care worker outcomes such as intention to leave, health complaints, absenteeism, presenteeism, and experiences of aggression from nursing home residents. It was confirmed that AOC is significantly related to intention to leave. Moreover, except for autonomy, all studied work environment factors were significantly related to AOC. Of these, the most important was leadership, followed by overall quality of care, collaboration with the nursing home director, the director of nursing, and colleagues, and staffing adequacy. On the other hand, facility and care worker characteristics contributed very little to understanding AOC variability.

As well as helping to stabilize the workforce, highly committed care workers might facilitate the recruitment process. One strategy to attract new people is to encourage referrals from current employees, i.e., word-of-mouth recommendations. Employees are more likely to recommend their nursing home if they are highly committed [116, 117], have high job satisfaction [118], and perceive their work environment positively [119, 120]. Although the challenge of maximizing an institution's attractiveness as an employer is highly relevant in long-term care, virtually no research has studied factors related to word-of-mouth recommendations.

In Chapter 8, the relationship of work environment factors and the quality of care with employee referral is examined, adjusting for the mediating effect of affective organizational commitment (AOC) and job satisfaction. This study shows that employee referral's relationships with supportive leadership and the possibility to provide high quality care are only partially mediated by organizational commitment and job satisfaction. While the latter two have the strongest association with employee referral, leadership and quality of care are additional important factors to consider. Nursing homes with better work environments might thus also profit from more employee referrals.

1.7.   Research gap and rationale for this dissertation

SHURP is a nursing home workforce-focused continuation of the RN4Cast study. Its main purpose is to gain a comprehensive understanding of the relationships facility and unit characteristics, care worker characteristics, work environment, safety climate, workload, and rationing of care have with care worker and resident outcomes. This dissertation concentrates on the one hand on implicit rationing of nursing care as a possible consequence of workforce shortages, its antecedents and its relationship with the overall quality of care in nursing homes. As has been shown above, implicit rationing of nursing care has not yet been measured in nursing homes; nor have any studies explored its antecedents. Therefore, evidence is scarce about its consequence for residents. On the other hand, workforce shortages challenge nursing homes to explore factors supporting the recruitment and retention of care workers. Regarding recruitment, while word-of mouth recommendations are an effective method of attracting new employees, this venue has scarcely been examined in the nursing home sector. Also, despite a strong relationship between AOC and workforce retention, no studies have yet focused closely on its antecedents.

The results reported here will help nursing homes to focus on critical aspects of their staffing and work environments, with the aim of improving their quality of care, recruitment and retention of qualified care workers. In addition, they will both inform international

nursing home research and provide a stable foundation for a further Swiss nursing home research program.

1.8.   References

1.   Bundesamt für Statistik. (2014). *Statistik der sozialmedizinischen Institutionen 2012 – Standardtabellen*. Neuchâtel: Bundesamt für Statistik.
2.   Höpflinger, F. and Van Wezemael, J. (2014). *Wohnen im höheren Lebensalter. Grundlagen und Trends*. Zürich: Seismo.
3.   Jaccard Ruedin, H. and Weaver, F. (2009). *Ageing workforcer in an ageing society. Wieviel Health Professionals braucht das Schweizer Gesundheitssystem bis 2030?* Neuchatel: Schweizerisches Gesundheitsobservatorium (OBSAN).
4.   Buchan, J., Twigg, D., Dussault, G., Duffield, C. and Stone, P. W. (2015). Policies to sustain the nursing workforce: an international perspective. *International Nursing Review*, n/a-n/a.
5.   Center for California Health Workforce Studies (2006). *An aging U.S. population and the health care workforce: Factors affecting the need for geriatric care workers*. Retrieved from http://futurehealth.ucsf.edu/Content/8877/2006_02_An_Aging_US_Population_and_the_Health_Care_Workforce_Factors_Affecting_the_Need_for_Geriatric_Care_Workers.pdf
6.   IOM (Institute of Medicine). (2008). *Retooling for an aging America: Building the health care workforce*. Washington, DC: The National Academies Press.
7.   OECD. (2011). *Health at a glance 2011: OECD indicators*. OECD Publishing.
8.   Höpflinger, F., Bayer-Oglesby, L. and Zumbrunn, A. (2011). *Pflegebedürftigkeit und Langzeitpflege im Alter. Aktualisierte Szenarien für die Schweiz*. Bern: Hans Huber.
9.   Schweizerisches Gesundheitsobservatorium. (2009). *Gesundheitspersonal in der Schweiz - Bestandesaufnahme und Perspektiven bis 2020*. Neuchâtel: Schweizerisches Gesundheitsobservatorium, Bundesamt für Statistik.
10.   Nies, H., Leichsenring, K. and Mak, S. (2013). The emerging identity of long-term care systems in Europe. In Leichsenring, K., Billings, J. and Nies, H. (Eds.), *Long-term care in Europe. Improving policy and practice*. Basingstoke, UK: Palgrave Macmillan.
11.   Widmer, R. (2013). *Zwischenbilanz: Wie wirkt sich die Einführung von SwissDRG auf die Langzeitpflege aus?* Bern: Curaviva Schweiz. Retrieved from http://upload.sitesystem.ch/E262A04C9D/4BFEA0B204/3ABA8EB8B6.pdf
12.   Colombo, F., Llena-Nozal, A. and Mercier, J., , et al. (2011). *OECD Health Policy Studies Help wanted? Providing and paying for long-term care*. OECD Publishing.
13.   Colombo, F., Llena-Nozal, A., Mercier, J. and Tjadens, F. (2011). *Help wanted? Providing and paying for long-term care*. OECD Health Policy Studies, OECD Publishing.
14.   BLS (Bureau of Labor Statistics) (2013). *Employment projections 2012-2022*. Retrieved from http://www.bls.gov/news.release/pdf/ecopro.pdf
15.   Institute for the Future of Aging Services (2007). *The long-term care workforce: Can the crisis be fixed?* Retrieved from http://www.leadingage.org/uploadedFiles/Content/About/Center_for_Applied_Research/Center_for_Applied_Research_Initiatives/LTC_Workforce_Commission_Report.pdf
16.   Lawlor, E. F. (2006). Imagining Medicare's next generation. *Public Policy & Aging Report*, *16*(3), 3-8.
17.   Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R. (2013). *[Survey of care workers in Swiss nursing homes - final report]* Basel: Universität Basel. Retrieved from http://nursing.unibas.ch/shurp

18. Kaiser Family Foundation (2007). *Views about the quality of long-term care services in the United States*. Retrieved from https://kaiserfamilyfoundation.files.wordpress.com/2013/01/7718.pdf

19. Blomberg, K., James, I. and Kihlgren, A. (2013). Meanings over time of working as a nurse in elderly care. *Open Nursing Journal*, *7*, 107-13.

20. Keenan, P. (2003). The nursing workforce shortage: Causes, consequences, proposed solutions. *Issue Brief (Commonw Fund)*, (619), 1-8.

21. National Center for Health Workforce Analyses, Bureau of Health Professions and Health Resources and Services Administration (2004). *Nursing aides, home health aides, and related health care occupations - national and local workforce shortages and associated data needs*. Retrieved from http://bhpr.hrsa.gov/healthworkforce/reports/rnhomeaides.pdf

22. Collier, E. and Harrington, C. (2008). Staffing characteristics, turnover rates, and quality of resident care in nursing facilities. *Research in Gerontological Nursing*, *1*(3), 157-170.

23. Donoghue, C. (2010). Nursing home staff turnover and retention: An analysis of national level data. *Journal of Applied Gerontology*, *29*(1), 89-106.

24. Prey, H., Schmid, M., Storni, M. and Mühleisen, S. (2004). *Zur Situation des Personals in der schweizerischen Langzeitpflege*. Zürich: Rüegger.

25. Barry, T. T., Brannon, D. and Mor, V. (2005). Nurse Aide Empowerment Strategies and Staff Stability: Effects on Nursing Home Resident Outcomes. *Gerontologist*, *45*(3), 309-317.

26. Castle, N. G. and Engberg, J. (2005). Staff turnover and quality of care in nursing homes. *Medical Care*, *43*(6), 616-626.

27. Trinkoff, A. M., Han, K., Storr, C. L., Lerner, N., Johantgen, M. and Gartrell, K. (2013). Turnover, staffing, skill mix, and resident outcomes in a national sample of US nursing homes. *Journal of Nursing Administration*, *43*(12), 630-6.

28. Castle, N. G., Engberg, J. and Men, A. (2007). Nursing home staff turnover: Impact on nursing home compare quality measures. *Gerontologist*, *47*(5), 650-61.

29. Brannon, D., Barry, T., Kemper, P., Schreiner, A. and Vasey, J. (2007). Job perceptions and intent to leave among direct care workers: Evidence from the Better Jobs Better Care demonstrations. *Gerontologist*, *47*(6), 820-829.

30. Morgan, J. C. and Konrad, T. R. (2008). A mixed-method evaluation of a workforce development intervention for nursing assistants in nursing homes: The case of WIN A STEP UP. *Gerontologist*, *48*, 71-79.

31. Mittal, V., Rosen, J. and Leana, C. (2009). A dual-driver model of retention and turnover in the direct care workforce. *Gerontologist*, *49*(5), 623-634.

32. Wiener, J. M., Squillace, M. R., Anderson, W. L. and Khatutsky, G. (2009). Why do they stay? Job tenure among certified nursing assistants in nursing homes. *Gerontologist*, *49*(2), 198-210.

33. Bowers, B. J., Esmond, S. and Jacobson, N. (2003). Turnover reinterpreted: CNAs talk about why they leave. *Journal of Gerontological Nursing*, *29*(3), 36-43.

34. Chu, C. H., Wodchis, W. P. and McGilton, K. S. (2014). Turnover of regulated nurses in long-term care facilities. *Journal of Nursing Management*, *22*(5), 553-562.

35. Kinjerski, V. and Skrypnek, B. J. (2008). The promise of spirit at work: Increasing job satisfaction and organizational commitment and reducing turnover and absenteeism in long-term care. *Journal of Gerontological Nursing*, *34*(10), 17-25.

36. Seaver, D. (2004). *The cost of frontline turnover in long-term care*. Washington, DC: Better Jobs Better Care/Institute for the Future of Aging Services.

37. Lafortune, G., Balestat, G. and Disability Study Expert Group Members (2007). *Trends in severe disability among elderly people: Assessing the evidence in 12 OECD countries and the future implications. OECD HEALTH WORKING PAPERS NO. 26*. Paris: OECD. Retrieved from http://www.oecd.org/sweden/38343783.pdf

38. Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R. (2013). *[Final report on the care worker survey in Swiss nursing homes]*. Basel: Universität Basel. Retrieved from http://nursing.unibas.ch/shurp

39. Bartelt, G. and Anliker, M. (2012). *Auswertung von RAI-Daten im Auftrag der Schweizerischen Alzheimervereinigung*. St. Gallen: Q-Sys.

40. Shin, J. H. and Bae, S. H. (2012). Nurse staffing, quality of care, and quality of life in US nursing homes, 1996-2011: An integrative review. *Journal of Gerontological Nursing*, *38*(12), 46-53.

41. Spilsbury, K., Hewitt, C., Stirk, L. and Bowman, C. (2011). The relationship between nurse staffing and quality of care in nursing homes: A systematic review. *International Journal of Nursing Studies*, *48*(6), 732-750.

42. Backhaus, R., Verbeek, H., van Rossum, E., Capezuti, E. and Hamers, J. P. (2014). Nurse staffing impact on quality of care in nursing homes: A systematic review of longitudinal studies. *Journal of the American Medical Directors Association*, *15*(6), 383-393.

43. Castle, N. G. (2008). Nursing home caregiver staffing levels and quality of care: A literature review. *Journal of Applied Gerontology*, *27*(4), 375-405.

44. Castle, N. G. and Engberg, J. (2007). The influence of staffing characteristics on quality of care in nursing homes. *Health Services Research*, *42*(5), 1822-47.

45. Castle, N. G. and Engberg, J. (2008). Further examination of the influence of caregiver staffing levels on nursing home quality. *Gerontologist*, *48*(4), 464-76.

46. Spence Laschinger, H. K. (2008). Effect of empowerment on professional practice environments, work satisfaction, and patient care quality: Further testing the Nursing Worklife Model. *Journal of Nursing Care Quality*, *23*(4), 322-30.

47. Kanai-Pak, M., Aiken, L. H., Sloane, D. M. and Poghosyan, L. (2008). Poor work environments and nurse inexperience are associated with burnout, job dissatisfaction and quality deficits in Japanese hospitals. *Journal of Clinical Nursing*, *17*(24), 3324-9.

48. Aiken, L. H., Clarke, S. P. and Sloane, D. M. (2002). Hospital staffing, organization, and quality of care: Cross-national findings. *Nursing Outlook*, *50*(5), 187-94.

49. Flynn, L., Liang, Y., Dickson, G. L. and Aiken, L. H. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatrics Society*, *58*(12), 2401-2406.

50. Anderson, R. A., Issel, L. M. and McDaniel, R. R., Jr. (2003). Nursing homes as complex adaptive systems: relationship between management practice and resident outcomes. *Nursing Research*, *52*(1), 12-21.

51. Temkin-Greener, H., Zheng, N. T., Cai, S., Zhao, H. and Mukamel, D. B. (2010). Nursing home environment and organizational performance: Association with deficiency citations. *Medical Care*, *48*(4), 357-64.

52. Temkin-Greener, H., Zheng, N., Katz, P., Zhao, H. and Mukamel, D. B. (2009). Measuring work environment and performance in nursing homes. *Medical Care*, *47*(4), 482-91.

53. Rantz, M. J., Hicks, L., Grando, V., Petroski, G. F., Madsen, R. W., Mehr, D. R., Conn, V., Zwygart-Staffacher, M., Scott, J., Flesner, M., Bostick, J., Porter, R. and Maas, M. (2004). Nursing home quality, cost, staffing, and staff mix. *Gerontologist*, *44*(1), 24-38.

54. Scott-Cawiezell, J., Main, D. S., Vojir, C. P., Jones, K., Moore, L., Nutting, P. A., Kutner, J. S. and Pennington, K. (2005). Linking nursing home working conditions to organizational performance. *Health Care Management Review*, *30*(4), 372-80.

55. Forbes-Thompson, S., Leiker, T. and Bleich, M. R. (2007). High-performing and low-performing nursing homes: A view from complexity science. *Health Care Management Review*, *32*(4), 341-351.

56. Eaton, S. C. (2000). Beyond 'unloving care': Linking human resource management and patient care quality in nursing homes. *The International Journal of Human Resource Management*, *11*(3), 591 - 616.

57. Gittell, J. H., Weinberg, D., Pfefferle, S. and Bishop, C. (2008). Impact of relational coordination on job satisfaction and quality outcomes: A study of nursing homes. *Human Resource Management Journal*, *18*(2), 154-170.

58. Forbes-Thompson, S. and Gessert, C. E. (2005). End of life in nursing homes: Connections between structure, process, and outcomes. *Journal of Palliative Medicine*, *8*(3), 545-555.

59. Donabedian, A. (1988). The quality of care: How can it be assessed? *Journal of the American Medical Association*, *260*(12), 1743-1748.

60. Mitchell, P. H., Ferketich, S. and Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Image. Journal of Nursing Scholarship*, *30*(1), 43-6.

61. Mitchell, P. H. and Lang, N. M. (2004). Framing the problem of measuring and improving healthcare quality: Has the Quality Health Outcomes Model been useful? *Medical Care*, *42*(2 Suppl), II4-11.

62. Mitchell, P. H., Ferketich, S. and Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Image: Journal of Nursing Scholarship*, *30*(1), 43-6.

63. Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health*, *25*(3), 176-88.

64. André, B., Sjøvold, E., Rannestad, T. and Ringdal, G. I. (2014). The impact of work culture on quality of care in nursing homes - a review study. *Scandinavian Journal of Caring Sciences*, *28*(3), 449-457.

65. Aiken, L. H., Clarke, S. P., Sloane, D. M., Lake, E. T. and Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration*, *38*(5), 223-9.

66. Aiken, L. H., Sloane, D. M., Clarke, S., Poghosyan, L., Cho, E., You, L., Finlayson, M., Kanai-Pak, M. and Aungsuroch, Y. (2011). Importance of work environments on hospital outcomes in nine countries. *International Journal for Quality in Health Care*, *23*(4), 357-364.

67. Purdy, N., Spence Laschinger, H. K., Finegan, J., Kerr, M. and Olivera, F. (2010). Effects of work environments on nurse and patient outcomes. *Journal of Nursing Management*, *18*(8), 901-913.

68. Spence Laschinger, H. K. and Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *Journal of Nursing Administration*, *36*(5), 259-67.

69. Kramer, M. and Schmalenberg, C. (2002). Staff nurses identify essentials of magnetism. In McClure, M. L. and Hinshaw, A. S. (Eds.), *Magnet hospitals revisited. Attraction and retention of professional nurses* (pp. 25-59). Washington, D.C.: American Nurses Publishing.

70.   Page, A., Institute of Medicine of the National Academies, Board on Healthcare Services and Committee on the Work Environment for Patient Safety (Eds). (2003). *Keeping patients safe. Transforming the work environment of nurses*. Washington, D.C.: National Academies Press.

71.   Jenkins, H. and Allen, C. (1998). The relationship between staff burnout/distress and interactions with residents in two residential homes for older people. *International Journal of Geriatric Psychiatry*, *13*(7), 466-72.

72.   Caspar, S. and O'Rourke, N. (2008). The influence of care provider access to structural empowerment on individualized care in long-term-care facilities. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *63B*(4), S255-65.

73.   Künzi, K. and Schär Moser, M. (2002). *Die Arbeitssituation im Pflegebereich im Kanton Bern*. Bern: Gesundheits- und Fürsorgedirektion des Kantons Bern.

74.   Brodaty, H., Draper, B. and Low, L. (2003). Nursing home staff attitudes towards residents with dementia: Strain and satisfaction with work. *Journal of Advanced Nursing*, *44*(6), 583-590.

75.   Zimber, A. (1999). Arbeitsbelastung und Beanspruchung in der Altenpflege. In Zimber, A. and Weyerer, S. (Eds.), *Arbeitsbelastung in der Altenpflege* (pp. 155-169). Göttingen: Verlag für Angewandte Psychologie.

76.   Pekkarinen, L., Sinervo, T., Perälä, M. and Elovainio, M. (2004). Work stressors and the quality of life in long-term care units. *Gerontologist*, *44*(5), 633-643.

77.   Pekkarinen, L., Sinervo, T., Elovainio, M., Noro, A. and Finne-Soveri, H. (2008). Drug use and pressure ulcers in long-term care units: do nurse time pressure and unfair management increase the prevalence? *J Clin Nurs*, *17*(22), 3067-73.

78.   Edvardsson, D., Sandman, P. O., Nay, R. and Karlsson, S. (2008). Associations between the working characteristics of nursing staff and the prevalence of behavioral symptoms in people with dementia in residential care. *International Psychogeriatrics*, *20*(4), 764-76.

79.   Reason, J. (2000). Human error: Models and management. *BMJ (Clinical Research Ed.)*, *320*(7237), 768-770.

80.   Flin, R. (2007). Measuring safety culture in healthcare: A case for accurate diagnosis. *Safety Science*, *45*(6), 653-667.

81.   Singer, S., Lin, S., Falwell, A., Gaba, D. and Baker, L. (2009). Relationship of safety climate and safety performance in hospitals. *Health Services Research*, *44*(2 Pt 1), 399-421.

82.   Colla, J. B., Bracken, A. C., Kinney, L. M. and Weeks, W. B. (2005). Measuring patient safety climate: a review of surveys. *Quality and Safety in Health Care*, *14*(5), 364-6.

83.   Hofmann, D. A. and Mark, B. (2006). An investigation of the relationship between safety climate and medication errors as well as other nurse and patient outcomes. *Personnel Psychology*, *59*(4), 847-869.

84.   Vogus, T. J. and Sutcliffe, K. M. (2007). The Safety Organizing Scale: development and validation of a behavioral measure of safety culture in hospital nursing units. *Medical Care*, *45*(1), 46-54.

85.   Pronovost, P. J., Berenholtz, S. M., Goeschel, C. A., Needham, D. M., Sexton, J. B., Thompson, D. A., Lubomski, L. H., Marsteller, J. A., Makary, M. A. and Hunt, E. (2006). Creating high reliability in health care organizations. *Health Services Research*, *41*(4 Pt 2), 1599-617.

86.   Hansen, L. O., Williams, M. V. and Singer, S. J. (2011). Perceptions of hospital safety climate and incidence of readmission. *Health Services Research*, *46*(2), 596-616.

87. Bonner, A. F., Castle, N. G., Men, A. and Handler, S. M. (2009). Certified nursing assistants' perceptions of nursing home patient safety culture: Is there a relationship to clinical outcomes? *Journal of the American Medical Directors Association*, *10*(1), 11-20.

88. Thomas, K. S., Hyer, K., Castle, N. G., Branch, L. G., Andel, R. and Weech-Maldonado, R. (2012). Patient safety culture and the association with safe resident care in nursing homes. *The Gerontologist*, *52*(6), 802-811.

89. Schubert, M., Ausserhofer, D., Desmedt, M., Schwendimann, R., Lesaffre, E., Li, B. and De Geest, S. (2013). Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals — a cross sectional study. *International Journal of Nursing Studies*, *50*(2), 230-239.

90. Jones, T. L., Hamilton, P. and Murry, N. (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *International Journal of Nursing Studies*, *52*(6), 1121-1137.

91. Schubert, M., Glass, T. R., Clarke, S. P., Schaffert-Witvliet, B. and De Geest, S. (2007). Validation of the Basel Extent of Rationing of Nursing Care instrument. *Nursing Research*, *56*(6), 416-24.

92. Morin, D. and Leblanc, N. (2005). Less money, less care: How nurses in long-term care allocate hours of needed care in a context of chronic shortage. *International Journal of Nursing Practice*, *11*(5), 214-20.

93. Slettebø, Å., Kirkevold, M., Andersen, B., Pedersen, R., Halvorsen, K., Nordhaug, M. and Nortvedt, P. (2010). Clinical prioritizations and contextual constraints in nursing homes – a qualitative study. *Scandinavian Journal of Caring Sciences*, *24*(3), 533-540.

94. Pedersen, R., Nortvedt, P., Nordhaug, M., Slettebo, A., Grothe, K. H., Kirkevold, M., Brinchmann, B. S. and Andersen, B. (2008). In quest of justice? Clinical prioritisation in healthcare for the aged. *Journal of Medical Ethics*, *34*(4), 230-5.

95. Bowers, B. J., Lauring, C. and Jacobson, N. (2001). How nurses manage time and work in long-term care. *Journal of Advanced Nursing*, *33*(4), 484-491.

96. Willumsen, T., Karlsen, L., Naess, R. and Bjorntvedt, S. (2012). Are the barriers to good oral hygiene in nursing homes within the nurses or the patients? *Gerodontology*, *29*(2), e748-55.

97. Simmons, S. F., Durkin, D. W., Rahman, A. N., Choi, L., Beuscher, L. and Schnelle, J. F. (2013). Resident characteristics related to the lack of morning care provision in long-term care. *Gerontologist*, *53*(1), 151-61.

98. Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M. and De Geest, S. (2008). Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, *20*(4), 227-37.

99. Schubert, M., Clarke, S. P., Glass, T. R., Schaffert-Witvliet, B. and De Geest, S. (2009). Identifying thresholds for relationships between impacts of rationing of nursing care and nurse- and patient-reported outcomes in Swiss hospitals: A correlational study. *International Journal of Nursing Studies*, *46*(7), 884-93.

100. Schubert, M., Clarke, S. P., Aiken, L. H. and De Geest, S. (2012). Associations between rationing of nursing care and inpatient mortality in Swiss hospitals. *International Journal for Quality in Health Care*, *24*(3), 230-8.

101. Kalisch, B. J., Tschannen, D. and Lee, K. H. (2012). Missed nursing care, staffing, and patient falls. *Journal of Nursing Care Quality*, *27*(1), 6-12.

102. Sochalski, J. (2004). Is more better?: The relationship between nurse staffing and the quality of nursing care in hospitals. *Medical Care*, *42*(2 Suppl), II67-73.

103. Ausserhofer, D., Schubert, M., Desmedt, M., Blegen, M. A., De Geest, S. and Schwendimann, R. (2013). The association of patient safety climate and nurse-related organizational factors with selected patient outcomes: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(2), 240-52.

104. Kalisch, B. J. and Xie, B. (2014). Errors of omission: Missed nursing care. *Western Journal of Nursing Research*, *36*(7), 875-890.

105. Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E. and Griffiths, P. (2014). 'Care left undone' during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality & Safety*, *23*(2), 116-25.

106. Lucero, R. J., Lake, E. T. and Aiken, L. H. (2010). Nursing care quality and adverse events in US hospitals. *Journal of Clinical Nursing*, *19*(15-16), 2185-95.

107. Nelson, S. T. and Flynn, L. (2015). Relationship between missed care and urinary tract infections in nursing homes. *Geriatric Nursing*, *36*(2), 126-130.

108. Meyer, J. P., Stanley, D. J., Herscovitch, L. and Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, *61*(1), 20-52.

109. Ingersoll, G. L., Olsan, T., Drew-Cates, J., DeVinney, B. C. and Davies, J. (2002). Nurses' job satisfaction, organizational commitment, and career intent. *The Journal of Nursing Administration*, *32*(5), 250-63.

110. Karsh, B., Booske, B. and Sainfort, F. (2005). Job and organizational determinants of nursing home employee commitment, job satisfaction and intent to turnover. *Ergonomics*, *48*(10), 1260-1281.

111. Meyer, J. P. and Allen, N. J. (Eds). (1997). *Commitment in the workplace: Theory, research, and application*. Thousand Oaks, CA: Sage Publications.

112. Al-Hussami, M. (2009). Predictors of nurses`commitment to health care organizations. *The Australian Journal of Advanced Nursing*, *26*(4), 36-48.

113. Rodwell, J., Noblet, A., Demir, D. and Steane, P. (2009). Supervisors are central to work characteristics affecting nurse outcomes. *Journal of Nursing Scholarship*, *41*(3), 310-9.

114. Rai, G. S. (2012). Organizational commitment among long-term care staff. *Administration in Social Work*, *36*(1), 53-66.

115. Steffen, T. M., Nystrom, P. C. and O'Connor, S. J. (1996). Satisfaction with nursing homes. The design of employees' jobs can ultimately influence family members' perspectives. *Journal of Health Care Marketing*, *16*(3), 34-8.

116. Gallup (2014). *Engagement Index Deutschland 2013*. Retrieved from http://www.inur.de/cms/wp-content/uploads/Gallup%20ENGAGEMENT%20INDEX%20DEUTSCHLAND%202013.pdf

117. Bloemer, J. (2010). The psychological antecedents of employee referrals. *The International Journal of Human Resource Management*, *21*(10/12), 1769-1791.

118. Van Hoye, G. (2013). Recruiting through employee referrals: An examination of employees' motives. *Human Performance*, *26*(5), 451-464.

119. Van Hoye, G. and Lievens, F. (2007). Investigating web-based recruitment sources: Employee testimonials vs word-of-mouse. *International Journal of Selection and Assessment*, *15*(4), 372-382.

120. Arnold, J., Coombs, C., Wilkinson, A., Loan-Clarke, J., Park, J. and Preston, D. (2003). Corporate images of the United Kingdom National Health Service; Implications for the recruitment and retention of nursing and allied health profession staff. *Corporate Reputation Review*, *6*(3), 223-238.

CHAPTER 2

STUDY AIMS

This dissertation is embedded in the Swiss Nursing Homes Human Resources Project (SHURP). The overall aims of SHURP were the following:

1) To describe relevant characteristics of care workers (i.e., professional group, age, professional experience), facilities and units (e.g., staffing, skill mix), work environments (e.g., teamwork, leadership), work stressors, safety climates, workloads and rationing of care.

2) To determine the prevalence of specific resident outcomes including falls, pressure ulcers, physical restraint use, weight loss, urinary tract infections, care worker-reported medication errors, aggressive behavior and elder abuse.

3) To describe the prevalence of care worker outcomes including job satisfaction, emotional exhaustion, intention to leave, work-related injuries and organizational commitment among care workers.

4) To compare staffing levels, skill mix variation, quality of work environment and care worker and resident outcomes based on facility and unit characteristics (e.g., size, focus of care).

5) To explore relationships between facility and unit characteristics, care worker characteristics, work environment, work stressors, safety climate, workload and rationing of care and resident and care worker outcomes.

This dissertation focused on aspects of aims 1, 3, and 5, describing in detail implicit rationing of nursing care (aim 1) and affective organizational commitment and employee referral (aim 3), and exploring the relationship between facility and unit characteristics, care worker characteristics, work environment, work stressors, safety climate and rationing of care, and a selection of the former with overall quality of care, affective organizational commitment and employee referral (aim 5). The aims of the six articles that form part of this dissertation were as follows:

SHURP study protocol (Chapter 3):

- To describe the rationale, aims, questionnaire development, measurement, data collection, and data management of SHURP.

First evidence of validity and reliability of the nursing home version of the Basel Extent of Rationing of Nursing care (BERNCA-NH) in Swiss nursing homes (Chapter 4):

- To describe the development of the nursing home version of the BERNCA and

- To provide initial evidence for validity based on test content, response processes, and internal structure, and evidence for reliability based on interscorer differences and inter-item inconsistencies for the German, French, and Italian language versions of the BERNCA-NH.

The relationship of staffing and work environment with implicit rationing of nursing care in Swiss nursing homes (Chapter 5):

- To describe levels and patterns of self-reported implicit rationing of care in Swiss nursing homes

- To explore the relationship between staffing level, turnover, and work environment factors and implicit rationing of nursing care

The relationship of staffing, work environment, work stressors, and rationing of care with care workers' perception of quality of care (Chapter 6):

- To describe care-worker reported quality of care

- To examine its relationship with staffing, work environment characteristics, work stressors, and implicit rationing of nursing care

Antecedents and consequences of affective organizational commitment in Swiss nursing homes (Chapter 7):

- To describe the level of AOC among care personnel in Swiss nursing homes

- To describe differences in AOC across subgroups in relation to facility size, catchment area, language region, profit status, and personnel gender, age, level of education, and nursing home experience

- To examine relationships between care personnel, situational, and organizational factors as antecedents of AOC

- To examine AOC's relationships with selected care personnel outcomes in Swiss nursing homes, as well as personnel's experience of resident aggression

The relationship of employee attitudes and work environment with employee referral (Chapter 8):

- To describe the prevalence of care workers' referral of their nursing home to potential employees

- To explore the relationship of work environment and quality of care and employee referral and the mediating effect of job satisfaction and affective organizational commitment on that relationship

CHAPTER 3

SWISS NURSING HOMES HUMAN RESOURCES PROJECT (SHURP): PROTOCOL OF AN OBSERVATIONAL STUDY

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3.1. Abstract

Aim. To explore the relationships between various nursing homes characteristics including work environment, care worker outcomes, and resident outcomes in Swiss nursing homes.

Background. In Switzerland, a growing number of older people live in nursing homes. Although research has addressed the issue of quality of nursing care in such facilities, few have integrated a range of interrelated factors that may influence the quality and safety of residential care. The Swiss Nursing Homes Human Resources Project will comprehensively assess key organizational factors, their interrelationships and the associations between these factors and care worker and resident outcomes.

Design. Cross-sectional design.

Methods. Three-year multi-center study (2011 – 2013) including a representative sample of approximately 160 nursing homes across the three language regions in Switzerland. Survey data will come from approximately 6,000 care workers and 160 administrators. Survey questionnaires will include variables on organizational facility characteristics and resident outcomes, care worker socio-demographic and professional characteristics, the quality of their work environments, resident safety climates and care worker outcomes. Appropriate descriptive and comparative analysis will be used and multivariate and multilevel analyses will be applied to examine the relationships between the various factors including quality of the work environment, safety climate, work stressors, rationing of care, workload, care worker and resident characteristics, as well as resident and care worker outcomes.

Discussion. The study results will contribute to a comprehensive understanding of the interrelationships between key organizational factors and resident / care worker outcomes and will also support planning and conducting interventions to improve quality of care concerning organizational factors affecting care workers in daily practice.

3.2. Introduction

In view of the increasing health care needs of older people and rising demand for nursing homes (NH) services, the quality of care in NHs is becoming an even more pressing issue of concern for consumers, care providers and governments. Previous NH research has addressed issues of quality of care and indicated associations between a variety of organizational, care worker and resident characteristics and outcomes. However, no existing NH study literature has looked comprehensively at the concurrent relationships between organizational factors, including work environment, safety climate, work stressors, workload and rationing of care and care worker and resident outcomes. This protocol describes a study that will comprehensively assess key organizational factors, their interrelationships and the associations between these factors and care worker and resident outcomes.

3.3. Background

National health systems rely on their healthcare workforces to ensure population health. Given the impact of demographic and epidemiological trends on population health, the demand for healthcare services, including nursing, is increasing [1-3]. This issue will be particularly pronounced in Switzerland, where the population is slightly older than average for OECD countries. In 2008, the share of the Swiss population over 65 years was 16.5%, with 21.4% below the age of 20, compared with OECD averages of 14.7% and 24.4%, respectively [4].

In the coming decades, this gap is expected to increase. With the baby boomer generation approaching old age, up to a 50% increase in persons 65 years and older is projected by the year 2050 in Switzerland [5]. Although the majority of elder citizens currently live in their own homes, in 2010, approximately 90,000 were living in nursing homes, an increase of 12% over 2001 [6-8]. In fact by 2030, the number of institutional care days for older people is projected to be 30% to 41% higher than the figure for 2000 [9]. Since

NH residents are older, more fragile, have more behavioral issues and receive more medications than the general population, their care needs will outpace their numbers. Meanwhile, projections indicate increasing shortages of qualified care workers [9]. Today, NHs face the concurrent challenges of providing high quality of care and maintaining a healthy workforce, while considering a broad range of organizational factors, e.g., staffing, skill mix, quality of the work environment, safety climate and work stressors, many of which appear to be interrelated and to influence resident and care worker outcomes.

3.3.1. Nursing home resident clinical outcomes and relationship with organizational factors

A series of studies have indicated that, due to reduced functional status, multiple co-morbidities, polypharmacy and cognitive impairment, older patients (including most NH residents) are especially vulnerable to adverse clinical outcomes. The prevalence of such outcomes is potentially related to organizational factors.

Fall rates in NH residents range from 2.3 to 4 per resident year [10], with up to 25% of falls resulting in fractures or lacerations [11]. Higher staffing levels seem to decrease falls [12, 13], but little is known about the relationship between falls and the work environment. NH *pressure ulcer* prevalence ranges from 2.4% to 23% [14], up to 60% of which are facility-acquired [15]. Pressure ulcers decrease residents' quality of life, while increasing risks of morbidity and mortality [16]. Higher staffing levels and higher professional staff mix [17, 18], supportive work environment [19], better teamwork [20] and less time pressure [21] have been linked to lower pressure ulcer prevalence. *Urinary tract infections (UTI)* are the most common infections in NHs, although often asymptomatic. Symptomatic UTIs are an important cause of morbidity and have an incidence rate of 0.1-2.4 episodes per 1000 patient-days [22]. Little is known about factors influencing the risk of UTIs in NHs. *Physical restraint use* prevalence ranges from 6% to 66% in NHs [23], though restrained residents experience more falls, pressure ulcers and aggression [23]. Factors related to less physical

restraint use are higher staffing levels [24], better communication and relationship-oriented leadership [25] and better teamwork [20]. *Weight loss,* with prevalences ranging from 10-40% in NH [26], increases affected residents' risk of infections or pressure ulcers and exacerbates chronic conditions [26]. Higher staffing levels have been associated with decreased weight loss in NHs [18, 27], but no more comprehensive view of influential factors exists. Exact prevalence rates for aggressive behavior are difficult to ascertain. However, less violent behavior in NH residents is associated with higher staffing levels [28] and more effective leadership [25], while care workers' feelings of inadequate preparation to care for residents with dementia [29] correlated with higher levels of aggressive behavior. *Elder abuse* is observed by 80% of NH staff; 16% report committing significant psychological abuse [30]. Poor work organization, staff shortages, difficult work environment, high workload and lack of supervision are relevant risk factors [31]. On the care worker's side, inadequate education, low job satisfaction, higher work stress and emotional exhaustion are associated with more elder abuse [31, 32]. *Medication errors* can result in serious harm or even mortality. The most common nurse-reported medication errors are dose omissions, timing errors, incorrect doses, incorrect medications and incorrect resident [33]. Care workers' medication errors increase with procedural deviations, including distractions during administration or excessive workloads [34]. To date, no study has comprehensively examined the factors influencing medication errors in NHs.

3.3.2. Organizational factors in nursing homes and relationships with care worker outcomes

A growing body of literature indicates that modifiable characteristics of the work environment significantly influence resident and care worker outcomes. In NHs, better communication, participation in decision-making, teamwork and relationship-oriented leadership are associated with less aggressive behavior in residents, less restraint use and fewer pressure ulcers [20, 25]. Still, few studies have examined the interplay of the various

dimensions of the work environment regarding NH outcomes. Furthermore, only two studies have examined the relationship between safety climate and resident outcomes, finding an association between a more favorable safety climate and less restraint use, but contradicting results concerning falls [35, 36]. A more advanced safety climate correlates with better communication and care workers' participation in decision-making, [37] but research remains scarce. Typical work stressors for care workers in NHs are workload, time pressure, personnel shortages, heavy physical labor, handling of 'difficult' residents and lack of professional prestige [38, 39]. A specific stressor is the experience of bullying and harassment in the working team, which correlates with nurses' intent to leave [40]. High workload is one of the main work stressors for care workers in NHs [38, 41]. Limited resources lead to clinical prioritization and rationing of care. On understaffed units, the omission of certain tasks can negatively affect resident outcomes. While it is known that prioritization dilemmas are present [42], no studies have examined the extent and consequences of *rationing of care* in NHs.

Higher job satisfaction is related to the possibility to provide high-quality care [43], good leadership [43, 44] and teamwork [45, 46]. Lower job satisfaction is associated with a lack of qualified personnel [47], high workload [45] and high work stress [46]. Organizational commitment, i.e., employees' attachment to their organizations, is widely studied because of its influence on intent to leave/turnover and absenteeism. Work environment and workload correlate strongly with organizational commitment [48]. Intention to leave/turnover in NHs has been studied extensively because of its negative impact on quality of care and care worker outcomes. Prominent determinants of intent to leave and turnover are high workload, care workers' perceptions that they are unable to meet residents' needs, lack of teamwork or professional development, job dissatisfaction and emotional exhaustion [45, 47, 49, 50].

3.3.3. Nursing home care workers' health and related organizational outcomes

Care workers in NHs are subject to various health risks, including physical complaints, needle-stick injuries and emotional exhaustion. In NHs, the most frequent physical complaints

among care workers include back pain, headache and heavy arms or legs [47]. Higher occupational stress is related to lower self-reported health and well-being [45]. Little is known about factors influencing needle-stick injuries in NHs. Emotional exhaustion is common among health professionals. In NHs, up to 23% of caregivers' questionnaire scores indicating critical levels of emotional exhaustion [47]. Emotional exhaustion was significantly related to both the lack of qualified personnel and the amount of overtime worked [47]. Little research has been done on absenteeism in NHs, i.e., care workers' physical absence from work on a scheduled workday because of sickness or injury [51]. On the individual level, experience, health, stress and job satisfaction are related to absenteeism [51, 52]. On the organizational level, influencing factors include job category, supervisor's support, the amount of overtime worked, type of nursing unit and organizational climate [50, 51].

3.4. Aims

The purpose of SHURP is to develop a comprehensive understanding of the relationships between various NH characteristics including work environment, care worker outcomes and resident outcomes in Swiss NHs and to fill existing gaps in NH research. To this end, the current study's research aims include:

1) To describe relevant characteristics of care workers (e.g., professional group, age, professional experience), facilities and units (e.g., staffing, skill mix), work environments (e.g., teamwork, leadership), work stressors, safety climates, workloads and rationing of care.

2) To determine the prevalence of specific resident outcomes including falls, pressure ulcers, physical restraint use, weight loss, urinary tract infections, care worker-reported medication errors, aggressive behavior and elder abuse.

3) To describe the prevalence of care worker outcomes including job satisfaction, emotional exhaustion, intention to leave, work-related injuries and organizational commitment among care workers.

4) To compare staffing levels, skill mix variation, quality of work environment and care worker and resident outcomes based on facility and unit characteristics (e.g., size, focus of care).

5) To explore relationships between facility and unit characteristics, care worker characteristics, work environment, work stressors, safety climate, workload and rationing of care and resident and care worker outcomes.

3.5. Conceptual framework

Regarding NH quality of care, the Quality of Health Outcomes Model [53], the model used in the RN4CAST study [54] and a hierarchy of factors influencing clinical practice [55] supported us in conceptualizing our study framework (Figure 1). This conceptual framework reflects the organizational factors influencing care worker and resident outcomes. It begins with NH organizational factors including strategic decisions, generic organizational processes and budgeting, resource allocation, planning and scheduling activities, communication, managing and auditing NH business operations. Ideally, all relevant consequences of these activities are communicated throughout the organization to individual work units where care workers and residents are engaged in care processes. There, factors such as staffing, skill mix and care needs are part of the work environment, along with safety climate factors (e.g., teamwork, communication/collaboration) that may increase or decrease the likelihood of adverse resident or care worker outcomes. We suspect that these relationships may be partly mediated by workload and rationing of care. In addition to care worker factors such as job satisfaction, educational level and professional experience, resident factors such as socio-demographics, dementia and special care needs can influence the likelihood of adverse

resident outcomes either directly, via their effect on unit factors, e.g., work environment, or indirectly, such as via decisions regarding care rationing.
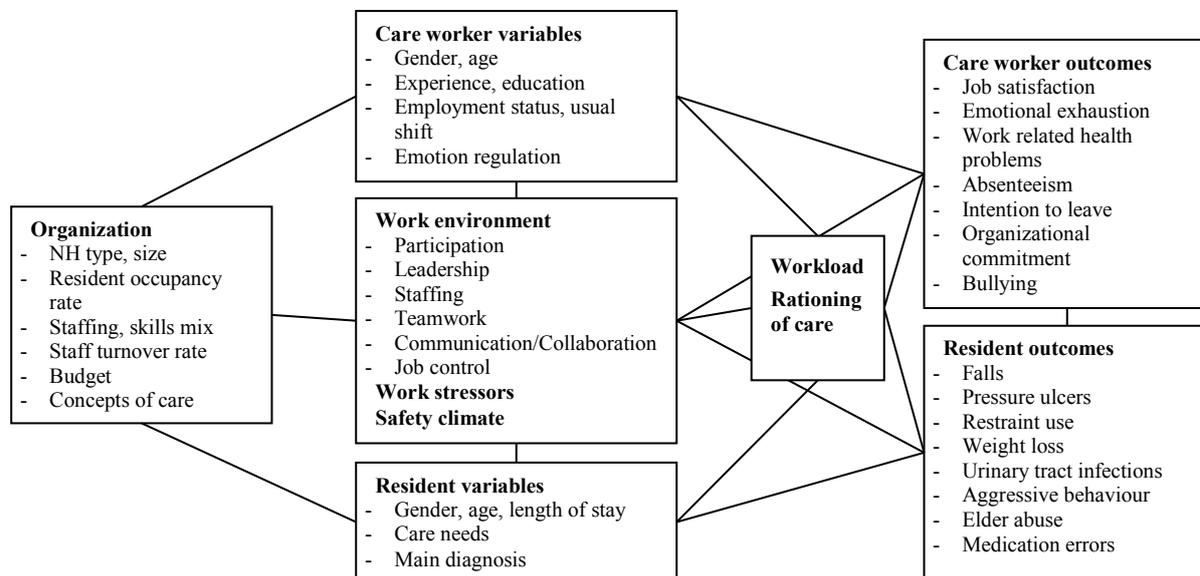
Figure 1: *Nursing home quality of care framework*

3.6. Design/Methodology

SHURP is a 3-year multi-center cross-sectional study using a stratified sampling design to include a representative sample of Swiss nursing homes. It builds on previous work by the Institute of Nursing Science at the University of Basel, Switzerland, in the acute care setting [54, 56-58] and for a pilot NH study [59]. It includes methods used successfully by previous studies (e.g., multi-center cross-cultural recruiting strategies and data collection procedures), while shifting the focus from hospital-based studies to the long-term care sector. The research project involves two overlapping phases. The first of these is focused on survey instrument development, site recruitment and data gathering (January 2011-May 2013), whereas the second is focused on data management, including quality control, data analysis and reporting (November 2012-December 2013).

3.6.1. Setting and sample

Approximately 1600 nursing homes (NHs) located across all 26 cantons of Switzerland (including the country's German-, French- and Italian-speaking regions) provide the setting for this national study. From these 1600 NHs, a representative sample of approximately 10% (ca. 160 NHs with a total of ca. 500 nursing units) will be randomly selected, then stratified according to language region and size: small (<50 beds), medium (50-99 beds) and large ($\geq$ 100 beds). Selection criteria are: Official designation as a nursing home; a capacity of at least 20 resident beds; and a staff of at least 15 care workers directly involved in resident care. Retirement homes and assisted living facilities will be excluded.

Approximately 600 NHs, stratified according to language region and size, will be mailed invitations to participate in this study. Those NH administrators willing to participate will sign a written agreement and will specify the number of care workers available to be surveyed.

In the selected NHs, all participating care workers, i.e., registered nurses, certified nurses and nursing aides, involved in direct care, who understand German, French or Italian and who have worked for at least one full month on their unit for at least 8 hours / week will be surveyed. We expect to collect data from approximately 6,000 professional care workers. Students and volunteers will be excluded. Administrative data will be collected for each NH, along with data on all of its residents.

3.6.2. Data sources, variables and measures

Based on the study model and previous experience regarding the RN4CAST study, three data sources were considered to obtain the information needed to address the study aims: 1) the care worker personnel questionnaire; 2) the facility questionnaire; 3) the unit questionnaire; and 4) administrative resident and resident outcome data.

The Care worker Personnel Questionnaire consists of 142 items organized in six main sections (Table 1). Additionally, data will be collected on the following care worker

characteristics: age, gender, type of profession, percentage of employment, country of professional education/training, academic training, usual working shift, and professional experience.

Table 1: *Overview of Care worker Personnel Questionnaire items and instruments scales*

Concept measured	Instrument used	Number of items
Work environment factors:		
- Leadership - Participation - Staffing and resources	Practice Environment Scale – Nursing Work Index [60], adapted for NH-use	14
Autonomy	Investigator-developed	1
Collaboration	Safety Attitudes Questionnaire (SAQ) [61]	1
Work stressors	30-item Health Professions Stress Inventory (HPSI) [41] (original version shortened based on prioritization by experts)	12
Quality of care and safety:		
General quality and safety	RN4CAST study questionnaire, adapted for NH-use	3
- Teamwork - Safety climate - Stress recognition	Safety Attitudes Questionnaire (SAQ) [61], adapted for NH-use	17
Rationing of care and workload:		
Rationing of care	Basel Extent of Rationing of Nursing Care instrument (BERNCA) [62], adapted for NH-use and extended with items about socio-cultural activities	19
Staffing characteristics and workload on last shift worked	RN4CAST study questionnaire, adapted for NH-use	9
Care worker outcomes:		
Job satisfaction	Investigator-developed	1
Affective organizational commitment	„Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem ‚**C**ommitment' gegenüber der **O**rganisation, dem **B**eruf/der Tätigkeit und der **B**eschäftigungsform" (COBB) [63]	5
Affective professional commitment	COBB [63] Original 7-item version shortened	3
Turnover intention	2 items from the Michigan Organizational Assessment Questionnaire (MOAQ) [64] 3 investigator-developed items based on Sager *et al*. [65]	5
Needlestick injuries	RICH-Nursing study questionnaire [66]	
Health problems	Swiss Health Survey [67] 1 additional investigator-developed item about allergies	6
Absenteeism	Swiss Health Survey [67]	1
Presentism	Investigator-developed	1
Bullying	Negative Acts Questionnaire [68]	4
Emotional exhaustion	Maslach Burnout Inventory [69] Selection of items	7
Emotion regulation	The Emotion Regulation Questionnaire (ERQ) using the reappraisal und suppression strategies subscales [70]	10

Concept measured	Instrument used	Number of items
Care worker-reported resident outcomes:		
Aggressive behavior against care workers and other residents	RN4CAST-Nurse questionnaire Differentiation of verbal, physical and sexual aggression based on Ryden's Aggression Scale [71]	3
Elder abuse	Investigator-developed items concerning the observation of emotional and physical abuse and neglect, derived from a questionnaire developed by Malmedal [72]	5
Frequency of falls, hospitalizations and medication errors	Investigator-developed	3

The facility questionnaire assesses facility characteristics at the NH level via 26 items, including organizational status (public/private subsidized/private), focus of care (e.g., dementia care), NH size (i.e., number of beds), quality and risk management measures (e.g., error reporting, error analysis, quality control), resident occupancy rates, including number of resident admissions and discharges, type of physician provider system, number of allied health care personnel (e.g., physiotherapists, social workers), overall number of NH personnel, tenure of NH administrator and director of nursing, and overall care worker recruiting situation.

The unit questionnaire assesses unit characteristics with 10 items: focus of care (e.g., dementia unit), number of beds, use of specific (dementia) care concepts (e.g., validation, reminiscence therapy) and dementia-specific infrastructure. The number of full time equivalent (FTE) posts for each care worker group, e.g., Bachelor of Science in Nursing (BSN), registered nurses (RN), licensed practical nurses (LPN), nursing assistants (NA), etc., number of persons who quit during the last 6 months, training certificates and burden of short- and long-term staff absences will be assessed. The number of FTE BSNs, RNs, LPNs and NAs per 100 residents will be calculated by dividing the total FTEs of each staff type by the number of beds on the unit and multiplying the result by 100. Staff skill mix will be calculated as the percent of total staffing FTEs (BSN, RN, LPN, NA, others) who are certified BSNs, RNs, LPNs, or NAs. Care worker staff turnover will be calculated by dividing the total

number of staff who vacated their positions on the participating units during the past six months by the number of staff employed in the survey month and multiplying by 100.

Administrative resident and resident outcome data. To assess the proportion of female residents, the mean age, mean length of stay and mean care-load per unit, data will be gathered either from existing assessment instruments used in Switzerland, such as the Resident Assessment Instrument for Nursing Homes (RAI-NH), the 'BewohnerInnen Einstufungs- und Abrechnungssystem' (BESA) or the 'Planification Informatisée des Soins Infirmiers Requis' (PLAISIR), or from the nursing home's administrative software, then aggregated to the unit level. Incompatibilities between the various assessment instruments used in Swiss NHs prevent the collection of further comparable resident data.

NH resident outcomes: The following clinical outcome data will be retrieved from NHs' adverse incidents registries and/or care documentation or collected via the unit questionnaire: the prevalence (number of residents with outcome/all residents on unit) of stage II or higher pressure ulcers at the time of survey and whether each developed during the NH stay; the prevalence of physical restraint use, divided into the use of bedrails, trunk restraint and use of chair that prevents rising, over 7 days prior to the time of the survey and whether electronic surveillance systems were in place; the prevalence of falls – defined as an unexpected event where the affected person comes to rest on the ground, the floor, or a lower level – along with the prevalence of fall-related injuries (e.g., bruises, fractures) in the 30 days prior to the survey date; the prevalence of symptomatic urinary tract infections (UTI) (defined as any UTI treated with antibiotics) in the 30 days prior to the survey date; the prevalence of significant weight loss (defined as a loss of weight of more than 5%) within the last 3 months as documented in the nursing records; and the incidence of acute-care hospital admissions in the 3 months prior to the survey date.

3.6.3. Survey translation and validity pre-testing

Various items from the German, French and Italian language RN4CAST questionnaire versions previously used in Swiss acute care hospitals were linguistically adapted to the NH setting. Original English or German scales not previously used in all three languages were translated into German, French, and Italian as necessary and adapted to NH use. Adaptations mainly involved referring to 'residents' instead of 'patients' and 'nursing home' instead of 'hospital.' The quality of each language version and validity of the care worker personnel questionnaire was assessed in three steps: 1) panels of 7-11 bilingual experts were assembled to judge the understandability and relevance of each item to obtain content validity indexes for each item separately (I-CVI) and for each of the various scales (S-CVI); 2) focus group interviews were conducted with registered nurses and licensed nurses (1st focus group), as well as with nursing aids (2nd focus group) using open discussion and think-aloud techniques to establish comprehensibility and understandability; 3) instruments were pilot-tested in five nursing homes (German and French speaking regions only) to check for response patterns; and 4) all items were back-translated from German, French and Italian into the original language of the scale and the need for corrections assessed by native English- or German-speaking researchers. To provide feedback on the relevancy and comprehensibility of items and data availability, the quality of each of the three language versions of the facility and unit questionnaires was assessed by an expert panel of NH administrators and Swiss NH Association executives.

3.6.4. Data collection

First, via a written information package, NH administrators, directors of nursing, unit managers and care workers will be informed of the current study's purpose and data collection procedures. Second, NH administrators will be invited to attend regional information meetings held by the research team, where they will receive first-hand study information,

including logistics and have the opportunity to discuss critical issues (e.g., supporting response rates).

Data collection will be led and coordinated at the Institute of Nursing Science at the University of Basel by one project manager for each language region. The questionnaires will be distributed to all care workers and NH administrators in each of the participating NH between May 2012 and April 2013. Care worker questionnaires packages, including postage-paid return envelopes, will be distributed via each NH's internal mail delivery system. The facility and unit questionnaires can either be completed online or filled out as hard copies and returned by post. Via unit-specific numerical codes assigned to each questionnaire, each NH's response rate per unit will be checked and reported back to the NH after 3 weeks of data collection. Depending on individual units' response rates, the data collection phase in the NHs will be completed after six to eight weeks. Completed questionnaires will be scanned using dedicated data scanning software. Prior to analysis, data quality (e.g., completeness, plausibility) will be verified by members of the research team.

3.6.5. Data analysis

Initially, all data will be analyzed descriptively. Missing data, data distribution, interrelationships and violation of assumptions underlying the identified statistical techniques will be checked and appropriate procedures applied (e.g., data transformations) to prepare data for inferential analysis. During preliminary analysis the internal consistency and construct validity of established scales will be examined. Data will be analyzed using SPSS (Version 20.0 for Windows), SAS (Version 9.0 for Windows) and Mplus (Version 6.1); P will be set at 0.05 (two-tailed).

In accordance with the study aims, data analysis will performed as follows: Aims 1-3: frequencies, percentages, median and interquartile ranges, means and standard deviations will be used as appropriate to describe the variables of interest. Aim 4: based on facility and unit

characteristics, multivariate and multilevel analyses will be applied as appropriate to explore differences in work environment factors and in care worker and resident outcomes.

Aim 5: regression methodology will be used to model resident and care worker outcomes as a function of facility and unit characteristics, work environment, work stressors, safety climate, workload, rationing of care and possible confounding variables (e.g., resident and care worker characteristics). Hierarchical generalized linear models (HGLM) will be used to address the challenges of: (1) possibly non-normal distributions of the dependent variables; (2) hierarchical data structures; and (3) possibly incomplete or variably sampled data.

3.6.6. Ethical considerations

Care workers of the selected NHs will participate voluntarily in the survey. The care worker personnel questionnaire package will include information about the study purpose, protection of data and the right not to participate. Informed consent is seen as granted if questionnaires are filled out and returned to the research group. Because of the sensitive nature of the information given, the participants will be advised to return their completed surveys directly to the study center using the pre-addressed and pre-stamped envelope provided. Care worker and NH data will be treated confidentially and stored in a locked cabinet after data entry. To protect the identities of the subjects, study data entered into the database will be identified only by the ID numbers of the respective NH units. The SHURP study was approved by the ethic committee of the state of 'beider Basel' (Ref.Nr. EK:02/12) who acted as the leading ethic committee in accordance with the regulations of the 'Arbeitsgemeinschaft der Schweizerischen Forschungs-Ethikkommissionen für klinische Versuche (AGEK)' as well as by the corresponding Swiss cantonal ethics committees of the cantons from which NH administrators agreed to participate.

3.7. Discussion

The SHURP study is the first NH research project to comprehensively study relations between key organizational factors and resident and care worker outcomes, thus adding evidence previously missing from the nursing home literature. It will contribute to the existing understanding of the relationships between various NH characteristics, including issues involving the workforce, work environment, care worker outcomes and resident outcomes in Swiss NH. This will support numerous stakeholders to address NH needs in Switzerland.

3.7.1. Stakeholders involvement

Alongside the research activities described above, SHURP researchers will disseminate information and coordinate stakeholder activities to support achieving the study objectives. A panel of more than 20 stakeholders was established early on to represent nursing, consumers and healthcare organizations at Switzerland's national and regional levels. The main role of this stakeholder panel is to raise awareness of the project and to support the research team in formulating policy recommendations based on the results.

3.7.2. Policy and scientific impact of the SHURP study

SHURP is the first representative Swiss NH study to address the issue of safety and quality of residential care. Its findings will be shared with each of the participating NHs, allowing them to benchmark descriptive results while strengthening partnerships for future projects. In addition to NH administrators and policy makers, it can be assumed that care workers and residents will benefit from this study's results via improvements in resident care quality and safety in Swiss NHs. SHURP will also support nurse workforce planning, e.g., staffing and skill mix levels, as required by NH managers and policy makers. And by identifying NH factors associated with higher incidences of unfavorable events affecting either residents or care workers, it will contribute substantially to a comprehensive understanding of the relationships between facility, unit, resident and care worker characteristics, key organizational factors and care worker and resident outcomes. The

knowledge and insights gained from SHURP will provide a robust basis for identifying quality and safety issues in Swiss NHs and designing interventions to improve resident and care worker outcomes.

3.8. Funding

3.9. Conflict of interest

No conflict of interest has been declared by the authors.

3.10. References

1.   Caldwell, J. C. (2001). Population health in transition. *Bulletin of the World Health Organization*, *79*(2), 159-60.
2.   OECD. (2011). *Health at a Glance 2011: OECD Indicators*. OECD Publishing.
3.   WHO Regional Office for Europe. (2009). *Health in the European Union. Trends and analysis*. Copenhagen: European Observatory on Health Systems and Policies.
4.   OECD/WHO. (2011). *OECD Reviews of Health Systems: Switzerland 2011*. Swiss Federal Office of Public Health.
5.   Bundesamt für Statistik. (2006). *Szenarien zur Bevölkerungsentwicklung der Schweiz*. Neuchâtel: Bundesamt für Statistik.
6.   Bayer-Oglesby, L. and Höpflinger, F. (2010). *Statistische Grundlagen zur regionalen Pflegeheimplanung in der Schweiz. Methodik und kantonale Kennzahlen (Obsan Bericht 47)*. Neuchâtel: Schweizerisches Gesundheitsobservatorium.
7.   Bundesamt für Statistik. (2003). *Krankenhausstatistik und Statistik der sozialmedizinischen Institutionen 2001*. Neuchâtel: Bundesamt für Statistik.
8.   Bundesamt für Statistik. (2012). *Statistik der sozialmedizinischen Institutionen 2010 - Standardtabellen*. Neuchâtel: Bundesamt für Statistik.
9.   Schweizerisches Gesundheitsobservatorium. (2009). *Gesundheitspersonal in der Schweiz - Bestandesaufnahme und Perspektiven bis 2020*. Neuchâtel: Schweizerisches Gesundheitsobservatorium, Bundesamt für Statistik.
10. Gruneir, A. and Mor, V. (2008). Nursing home safety: Current issues and barriers to improvement. *Annual Review of Public Health*, *29*, 369-82.
11. Rubenstein, L. (2006). Falls in older people: Epidemiology, risk factors and strategies for prevention. *Age & Ageing*, *35*(Suppl 2), ii37-ii41.
12. Hofmann, M. T., Bankes, P. F., Javed, A. and Selhat, M. (2003). Decreasing the incidence of falls in the nursing home in a cost-conscious environment: A pilot study. *Journal of the American Medical Directors Association*, *4*(2), 95-7.
13. Leland, N. E., Gozalo, P., Teno, J. and Mor, V. (2012). Falls in newly admitted nursing home residents: A national study. *Journal of the American Geriatrics Society*, *60*(5), 939-45.
14. Horn, S. D., Bender, S. A., Bergstrom, N., Cook, A. S., Ferguson, M. L., Rimmasch, H. L., Sharkey, S. S., Smout, R. J., Taler, G. and Voss, A. C. (2002). Description of the National Pressure Ulcer Long-Term Care Study. *Journal of the American Geriatrics Society*, *50*(11), 1816-1825.
15. Lahmann, N. A., Halfens, R. J. and Dassen, T. (2006). Pressure ulcers in German nursing homes and acute care hospitals: Prevalence, frequency, and ulcer characteristics. *Ostomy Wound Manage*, *52*(2), 20-33.
16. Tannen, A., Dietz, E., Dassen, T. and Halfens, R. (2009). Explaining the national differences in pressure ulcer prevalence between the Netherlands and Germany - adjusted for personal risk factors and institutional quality indicators. *Journal of Evaluation in Clinical Practice*, *15*(1), 85-90.
17. Bostick, J. E. (2004). Relationship of nursing personnel and nursing home care quality. *Journal of Nursing Care Quality*, *19*(2), 130-6.
18. Schnelle, J. F., Simmons, S. F., Harrington, C., Cadogan, M., Garcia, E. and Bates-Jensen, B. M. (2004). Relationship of nursing home staffing to quality of care. *Health Services Research*, *39*(2), 225-50.
19. Flynn, L., Liang, Y., Dickson, G. L. and Aiken, L. H. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatrics Society*, *58*(12), 2401-2406.

20.   Eaton, S. C. (2000). Beyond 'unloving care': Linking human resource management and patient care quality in nursing homes. *The International Journal of Human Resource Management*, *11*(3), 591 - 616.

21.   Pekkarinen, L., Sinervo, T., Elovainio, M., Noro, A. and Finne-Soveri, H. (2008). Drug use and pressure ulcers in long-term care units: Do nurse time pressure and unfair management increase the prevalence? *Journal of Clinical Nursing*, *17*(22), 3067-73.

22.   Nicolle, L. E. (2002). Urinary tract infection in geriatric and institutionalized patients. *Current Opinion in Urology*, *12*(1), 51-5.

23.   Hamers, J. P. H. and Huizing, A. R. (2005). Why do we use physical restraints in the elderly? *Zeitschrift fur Gerontologie und Geriatrie*, *38*(1), 19-25.

24.   Weech-Maldonado, R., Meret-Hanke, L., Neff, M. C. and Mor, V. (2004). Nurse staffing patterns and quality of care in nursing homes. *Health Care Management Review*, *29*(2), 107-16.

25.   Anderson, R. A., Issel, L. M. and McDaniel Jr, R. R. (2003). Nursing homes as complex adaptive systems: Relationship between management practice and resident outcomes. *Nursing Research*, *52*(1), 12-21.

26.   Pauly, L., Stehle, P. and Volkert, D. (2007). Nutritional situation of elderly nursing home residents. *Zeitschrift fur Gerontologie und Geriatrie*, *40*(1), 3-12.

27.   Dyck, M. J. (2007). Nursing staffing and resident outcomes in nursing homes: Weight loss and dehydration. *Journal of Nursing Care Quality*, *22*(1), 59-65.

28.   Isaksson, U., Aström, S., Sandman, P.-O. and Karlsson, S. (2009). Factors associated with the prevalence of violent behaviour among residents living in nursing homes. *Journal of Clinical Nursing*, *18*(7), 972-980.

29.   Morgan, D., Stewart, N., D'Arcy, C., Forbes, D. and Lawson, J. (2005). Work stress and physical assault of nursing aides in rural nursing homes with and without dementia special care units. *Journal of Psychiatric and Mental Health Nursing*, *12*(3), 347-358.

30.   Cooper, C., Selwood, A. and Livingston, G. (2008). The prevalence of elder abuse and neglect: A systematic review. *Age and Ageing*, *37*(2), 151-160.

31.   Lindbloom, E. J., Brandt, J., Hough, L. D. and Meadows, S. E. (2007). Elder mistreatment in the nursing home: A systematic review. *Journal of the American Medical Directors Association*, *8*(9), 610-6.

32.   Bužgová, R. and Ivanová, K. (2009). Elder abuse and mistreatment in residential settings. *Nursing Ethics*, *16*(1), 110-126.

33.   Greene, S. B., Williams, C. E., Pierson, S., Hansen, R. A. and Carey, T. S. (2010). Medication error reporting in nursing homes: Identifying targets for patient safety improvement. *Quality and Safety in Health Care*, *19*(3), 218-222.

34.   Brady, A. M., Malone, A. M. and Fleming, S. (2009). A literature review of the individual and systems factors that contribute to medication errors in nursing practice. *Journal of Nursing Management*, *17*(6), 679-97.

35.   Bonner, A. F., Castle, N. G., Men, A. and Handler, S. M. (2009). Certified nursing assistants' perceptions of nursing home patient safety culture: Is there a relationship to clinical outcomes? *Journal of the American Medical Directors Association*, *10*(1), 11-20.

36.   Thomas, K. S., Hyer, K., Castle, N. G., Branch, L. G., Andel, R. and Weech-Maldonado, R. (2012). Patient safety culture and the association with safe resident care in nursing homes. *Gerontologist*, *52*(6), 802-811.

37.   Scott-Cawiezell, J., Vogelsmeier, A., McKenney, C., Rantz, M., Hicks, L. and Zellmer, D. (2006). Moving from a culture of blame to a culture of safety in the nursing home setting. *Nursing Forum*, *41*(3), 133-140.

38. Künzi, K. and Schär Moser, M. (2002). *Die Arbeitssituation im Pflegebereich im Kanton Bern*. Bern: Gesundheits- und Fürsorgedirektion des Kantons Bern.

39. Zimber, A. (1999). Arbeitsbelastung und Beanspruchung in der Altenpflege. In Zimber, A. and Weyerer, S. (Eds.), *Arbeitsbelastung in der Altenpflege* (pp. 155-169). Göttingen: Verlag für Angewandte Psychologie.

40. Simons, S. (2008). Workplace bullying experienced by Massachusetts registered nurses and the relationship to intention to leave the organization. *Advances in Nursing Science*, *31*(2), E48-59.

41. Lapane, K. L. and Hughes, C. M. (2007). Considering the employee point of view: Perceptions of job satisfaction and stress among nursing staff in nursing homes. *Journal of the American Medical Directors Association*, *8*(1), 8-13.

42. Slettebø, Å., Kirkevold, M., Andersen, B., Pedersen, R., Halvorsen, K., Nordhaug, M. and Nortvedt, P. (2010). Clinical prioritizations and contextual constraints in nursing homes – a qualitative study. *Scandinavian Journal of Caring Sciences*, *24*(3), 533-540.

43. Castle, N. G., Degenholtz, H. and Rosen, J. (2006). Determinants of staff job satisfaction of caregivers in two nursing homes in Pennsylvania. *BMC Health Services Research*, *6*, 60.

44. Parsons, S. K., Simmons, W. P., Penn, K. and Furlough, M. (2003). Determinants of satisfaction and turnover among nursing assistants: The results of a statewide survey. *Journal of Gerontological Nursing*, *29*(3), 51-58.

45. Schaefer, J. A. and Moos, R. H. (1996). Effects of work stressors and work climate on long-term care staff's job morale and functioning. *Research in Nursing & Health*, *19*(1), 63:73.

46. Hasson, H. and Arnetz, J. E. (2008). Nursing staff competence, work strain, stress and satisfaction in elderly care: A comparison of home-based care and nursing homes. *Journal of Clinical Nursing*, *17*(4), 468-481.

47. Prey, H., Schmid, M., Storni, M. and Mühleisen, S. (2004). *Zur Situation des Personals in der schweizerischen Langzeitpflege*. Zürich: Rüegger.

48. Heyne-Kuhn, M., Hug, A. and Burkhard, W. [Psychological work burden and strain of nursing personnel in long term care settings for demented older people]. *Pflegewissenschaft*, *13*(4), 233-251.

49. Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., Spence Laschinger, H. K., North, N. and Stone, P. W. (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, *43*(2), 237-63.

50. Kinjerski, V. and Skrypnek, B. J. (2008). The promise of spirit at work: Increasing job satisfaction and organizational commitment and reducing turnover and absenteeism in long-term care. *Journal of Gerontological Nursing*, *34*(10), 17-25.

51. Thomson, D. (2005). Absenteeism. In McGillis Hall, L. (Eds.), *Quality work environments for nurse and patient safety* (pp. 229-255). Sudbury, MA: Jones and Bartlett.

52. Cohen, A. and Golan, R. (2007). Predicting absenteeism and turnover intentions by past absenteeism and work attitudes: An empirical examination of female employees in long term nursing care facilities. *The Career Development International*, *12*(5), 416-432.

53. Mitchell, P. H., Ferketich, S. and Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Image: Journal of Nursing Scholarship*, *30*(1), 43-6.

54. Sermeus, W., Aiken, L. H., Van den Heede, K., Rafferty, A. M., Griffiths, P., Moreno-Casbas, M. T., Busse, R., Lindqvist, R., Scott, A. P., Bruyneel, L., Brzostek, T., Kinnunen, J., Schubert, M., Schoonhoven, L. and Zikos, D. (2011). Nurse forecasting in Europe (RN4CAST): Rationale, design and methodology. *BMC Nursing*, *10*, 6.

55.   Vincent, C., Taylor-Adams, S. and Stanhope, N. (1998). Framework for analysing risk and safety in clinical medicine. *BMJ*, *316*(7138), 1154-7.

56.   Aiken, L. H., Sermeus, W., Van den Heede, K., Sloane, D. M., Busse, R., McKee, M., Bruyneel, L., Rafferty, A. M., Griffiths, P., Moreno-Casbas, M. T., Tishelman, C., Scott, A., Brzostek, T., Kinnunen, J., Schwendimann, R., Heinen, M., Zikos, D., Sjetne, I. S., Smith, H. L. and Kutney-Lee, A. (2012). Patient safety, satisfaction, and quality of hospital care: Cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ*, *344*, e1717.

57.   Ausserhofer, D., Schubert, M., Engberg, S., Blegen, M., De Geest, S. and Schwendimann, R. (2012). Nurse-reported patient safety climate in Swiss hospitals: A descriptive-explorative substudy of the Swiss RN4CAST study. *Swiss Medical Weekly*, *142*, 0.

58.   Schubert, M., Ausserhofer, D., Desmedt, M., Schwendimann, R., Lesaffre, E., Li, B. and De Geest, S. (2013). Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals — a cross sectional study. *International Journal of Nursing Studies*, *50*(2), 230-239.

59.   Zúñiga, F., Schwappach, D. L., De Geest, S. and Schwendimann, R. (2013). Psychometric properties of the Swiss version of the Nursing Home Survey on Patient Safety Culture. *Safety Science*, *55*(0), 88-118.

60.   Lake, E. T. (2007). The nursing practice environment: Measurement and evidence. *Medical Care Research and Review*, *64*(2 Suppl), 104S-22S.

61.   Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R. and Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, *6*, 44.

62.   Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M. and De Geest, S. (2008). Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, *20*(4), 227-37.

63.   Felfe, J., Six, B., Schmook, R. and Knorz, C. (2010). Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem Commitment gegenüber der Organisation, dem Beruf / der Tätigkeit und der Beschäftigungsform (COBB). In Glöckner-Rist, A. (Eds.), *Zusammenstellung sozialwissenschaftlicher Items und Skalen ZIS Version 14.00*. Bonn: GESIS.

64.   Cammann, C., Fichman, M., Jenkins, D. and Klesh, J. (1979). The Michigan Organizational Assessment Questionnaire. In Seashore, S. E., Lawler, E. E., Mirvis, P. H. and Cammann, C. (Eds.), *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71–138). New York: Wiley-Interscience.

65.   Sager, J. K., Griffeth, R. W. and Hom, P. W. (1998). A comparison of structural models representing turnover cognitions. *Journal of Vocational Behavior*, *53*(2), 254-273.

66.   Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M., Abraham, I. and De Geest, S. (2009). *RICH Nursing Study*. Basel: Institut für Pflegewissenschaft, Universität Basel. Retrieved from http://www.sbk-sg.ch/webseiten/1weiterenews/pdf/2005%2002%2011%20RICH%20Studie.pdf

67.   Eidgenössisches Departement des Inneren and Bundesamt für Statistik (2007). *Schweizerische Gesundheitsbefragung 2007 - Telefonischer und schriftlicher Fragebogen*. Retrieved from http://www.bfs.admin.ch/bfs/portal/de/index/infothek/erhebungen__quellen/blank/blank/ess/03.Document.118255.pdf

68. Simons, S., Stark, R. B. and DeMarco, R. F. (2011). A new, four-item instrument to measure workplace bullying. *Research in Nursing & Health*, *34*(2), 132-140.

69. Maslach, C. and Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour*, *2*(2), 99-113.

70. Gross, J. J. and John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348-62.

71. Oh, H., Eom, M. and Kwon, Y. (2004). A study on aggressive behavior among nursing home residents with cognitive impairment. *Taehan Kanho Hakhoe Chi*, *34*(8), 1451-9.

72. Malmedal, W., Ingebrigtsen, O. and Saveman, B.-I. (2009). Inadequate care in Norwegian nursing homes – as reported by nursing staff. *Scandinavian Journal of Caring Sciences*, *23*(2), 231-242.

CHAPTER 4

FIRST EVIDENCE ON THE VALIDITY AND RELIABILITY OF THE BASEL EXTENT OF IMPLICIT RATIONING OF NURSING CARE – NURSING HOME VERSION (BERNCA-NH)

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4.1. Abstract

Aim. To develop and psychometrically test the Basel Extent of Rationing of Nursing Care for Nursing Homes (BERNCA-NH) instrument, providing initial evidence on the validity and reliability of the German, French, and Italian language versions.

Background. In the hospital setting, implicit rationing of nursing care is defined as the withholding of nursing activities due to lack of resources, such as staffing or time. No instrument existed to measure this concept in the nursing home setting.

Design. Cross-sectional study.

Methods. We developed the BERNCA-NH in three phases: 1) adaption and translation, 2) content validity testing, and 3) initial validity and reliability testing. We analyzed survey data from 4748 care workers collected between May 2012 and April 2013 from a randomly selected sample of 162 nursing homes in the German-, French-, and Italian-speaking regions of Switzerland to provide evidence from response processes (e.g. missing), internal structure (exploratory factor analysis), inter-item inconsistencies (e.g. Cronbach's alpha), and interscorer differences (e.g. within-group agreement).

Results. Exploratory factor analysis revealed a four-factor structure with good fit statistics and inter-item consistency. Rationing of nursing care was structured in four domains: (1) activities of daily living, (2) caring, rehabilitation and monitoring, (3) documentation, and (4) social care. Items of the social care subscale showed lower content validity and more missing values than items of other subscales.

Conclusion. First evidence indicates that BERNCA-NH seems to be a valid and reliable instrument to measure implicit rationing of nursing care in nursing homes, though further refinements of single items are needed.

4.2. Summary statement

Why is this research or review needed?

- The Basel Extent of Rationing of Nursing Care (BERNCA) was developed to measure implicit rationing of nursing care in acute care hospitals, which is associated with both nurse and patient outcomes.

- Measuring implicit rationing of nursing care in nursing homes will help to identify its prevalence rates and patterns and guide the development of quality improvement interventions.

- No instrument existed so far to measure implicit rationing of nursing care in the nursing home setting.

What are the key findings?

- The Basel Extent of Rationing of Nursing Care (BERNCA) was adapted for the nursing home sector (BERNCA-NH).

- First evidence supports the validity and reliability of the German, French, and Italian language versions of the BERNCA-NH.

- The BERNCA-NH could be improved by revising items about social care and adding an item concerning the rationing of nursing care in the medication process.

How should the findings be used to influence policy/practice/research/education?

- The measurement of implicit rationing of nursing care in practice helps to identify imbalances between resident care needs and available resources.

- The measurement of rationing allows reflection and debate among nursing home managers, healthcare policy makers and service users about which situations and for what activities rationing of care might be acceptable.

- Monitoring implicit rationing of care over time allows evaluation of the effect of policy and management decisions on the availability and deployment of resources and their effect on the processes of nursing home care.

4.3. Introduction

In health care, the allocation of scarce resources is a daily challenge [1]. The lack of time or personnel resources leads to rationing of services with detrimental effects not only for residents and patients but also for health care personnel. A recent survey study in New Jersey nursing homes revealed a high percentage of registered nurses reporting missing comforting residents (34%) and developing/updating care plans (26%), while few nurses left pain management (2%) or the administration of medications (7%) undone [2]. Two other nursing home studies showed similar patterns with care workers lacking time for communication and personal care of residents while medication, support with elimination, and monitoring of residents were upheld [3, 4].

The increasing risk of exposure to rationing of care in older persons due to the growing gap between existing needs and available resources has been emphasized internationally [4-6]. A Swiss survey concluded that older persons in long-term care are at a higher risk of being exposed to implicit rationing of health care services at the policy level as a result of being a rather passive, vulnerable population with low-visibility diseases [7]. The lack of available resources has consequences for care workers in direct contact with residents. They are challenged to decide on a daily basis what services to provide and what to leave out. However, no instruments have been specifically developed to measure rationing of nursing care in nursing homes and no psychometric testing is reported for the questionnaires that have been used. The measurement of implicit rationing of nursing care could help to identify the level of rationing and its associated factors, which need to be addressed in order to improve the quality of care and residents' quality of life by holding rationing of nursing care to a minimal level.

4.3.1. Implicit rationing of nursing care – conceptual basis

In the acute care setting, implicit rationing of nursing care was conceptually defined as "the withholding of or failure to carry out necessary nursing measures for patients due to a

lack of nursing resources (staffing, skill mix, time)" [8]. Implicit rationing of nursing care refers to the rationing at the individual level of a care worker in direct contact with a patient. Implicit means, there are neither specified criteria for the decision-making concerning the rationing, nor are the decisions made transparent to the patients [9]. When resources are insufficient, the nurses decide what tasks to perform based on their clinical decision making and judgment, and they might decide to either leave activities out, delay them or do them faster and with lesser quality [8]. According to the conceptual framework described by Schubert and colleagues [8], the decision-making process is influenced by different factors such as organizational characteristics, the work environment, or philosophy of care, as well as patient and nurse characteristics and is expected to affect patient and nurse outcomes.

Implicit rationing of nursing care is a relevant phenomenon in nursing home settings as well, although the specification of necessary nursing care activities is different from acute care, since nursing homes have the dual task of both providing medical and social care for residents. According to Swiss health care legislation (KLV, Art. 7), nursing homes are mandated to provide assessment, consultation, and coordination of care; to perform examinations and treatments; to offer basic care in the activities of daily living; and to monitor and support people with mental diseases in their everyday needs. Although care workers in nursing homes have a variety of educational backgrounds ranging from several years of education (e.g. registered nurses) to on the job training (e.g. nurse aides), the basic tenets of the conceptual framework for registered nurses in acute care are valid in the sense that nursing home care workers individually decide what task to perform or prioritize within their scope of practice. They are also influenced by all the factors mentioned in the framework.

4.3.2. Measuring implicit rationing of nursing care in nursing homes

According to a recent review [10], several terms are related to implicit rationing of nursing care, such as missed care, omitted care, or care left undone, which the authors

summarize under the umbrella term of unfinished care. Several instruments have been developed to measure the extent of unfinished care in acute-care settings [10]. Only one of them, the Basel Extent of Rationing of Nursing Care (BERNCA), measures implicit rationing of care. In it, nurses are asked how often in the last 7 working days they were unable to carry out 20 necessary nursing tasks due to time constraints, respectively 32 tasks in a revised version [8]. Answer options range from "never" to "often" on a 4-point Likert scale with the option "activity was not necessary" added in the revised version. Psychometric analysis showed good content validity, a unidimensional internal structure with stable factor loadings and a Cronbach's α of 0.93. Moreover, implicit rationing of nursing care measured with BERNCA has been shown to be related to patient outcomes such as satisfaction, medication errors, falls, nosocomial infections, critical incidents, pressure ulcers, and in-hospital mortality [11-13].

In the absence of a measure for the nursing home setting, we decided to develop the Basel Extent of Rationing of Nursing Care for Nursing Homes (BERNCA-NH), by revising the BERNCA, since studies in acute-care settings revealed that it is a conceptually and psychometrically sound measure [8]. In this study we aimed (1) to describe the development of the nursing home version of the BERNCA and (2) to provide initial evidence for validity based on test content, response processes, and internal structure, and evidence for reliability based on interscorer differences and inter-item inconsistencies for the German, French, and Italian language versions of the BERNCA-NH.

4.4. Methodology

The development and testing of the BERNCA-NH was done in three phases: Phase 1: adaption and translation, Phase 2: content validity testing, and Phase 3: examining aspects of its validity and reliability including validity based on response processes and internal structure and reliability based on inter-item inconsistencies and interscorer differences.

4.4.1. Phase 1: adaption and translation

The BERNCA hospital version is available in German, French, and Italian from the Swiss branch of the RN4Cast study [14], although only the German version was psychometrically tested [8]. SHURP had the permission to use the instrument as a continuation of the RN4Cast study in the nursing home sector. We decided to adapt the first 20-item version of BERNCA and not the revised 32-item version [13, 14] in order to minimize care worker burden associated with completing study questionnaires. The items of the original BERNCA were selected based on literature review and clinical expertise and checked with experts in the hospital field. Items were grouped into five sections, which were maintained for the structuring of the nursing home version: rationing of (a) activities of daily living; (b) caring and support; (c) rehabilitation, instruction, and education; (d) monitoring and safety; and (e) documentation.

In a first step, the hospital version needed to be simplified and the content adapted. Since registered nurses are a minority in nursing homes and assistant personnel provide a major part of direct care, the measurement of implicit rationing needed to include all care workers on nursing home units to provide a valid overall picture of rationing. Therefore the language of the questionnaire's items was adopted to enhance understanding for the different groups of care workers. Additionally, words were modified to better represent the nursing home setting, e.g. replacing "patient" with "resident". Based on discussions in the research team, the content was also adapted: Five items of the original questionnaire were deleted because of their lack of relevance for all nursing homes care workers, such as rationing of patient education and preparation for discharge, and the late arrival of a physician when called, all activities mostly performed by registered nurses. We added one item about the rationing of support with drinking. In contrast to hospitals, nursing homes are often the final home of their residents, so that they do not only have a responsibility for medical care, but most importantly also for social care. We added therefore three items about the rationing of

planned individual and group activities and of cultural activities outside the nursing home, which are important promoters of the quality of life of nursing home residents [15, 16]. The final German BERNCA-NH version had 19 items asking care workers "How often in your last 7 working days did it happen that…" they could not carry out the listed activities with the answer options "activity not necessary", "never", "seldom", "sometimes", and "often". One item about the updating of care plans included the answer option "not within my responsibility", since only registered nurses are responsible for this task. In a next step, to have a culturally adapted and easily understandable version in all languages that reflected the original meaning, the French and Italian questionnaires were first translated, back-translated and checked in expert groups for agreement with the original German version [17].

4.4.2. Phase 2: Content validity testing

The relevancy of the BERNCA-NH items' content for their corresponding scale was assessed by experts in gerontological care (German version: 10 experts, French version: 13, Italian version: 6) holding at least a Certificate of Advanced Studies and up to a Master's degree with experience in nursing home care. A minimum of 3 experts is recommended for content validity testing [18]. The experts were surveyed between November 2011 and August 2012. Based on their ratings, the content validity index of the individual items (I-CVI) was calculated. An I-CVI of .78 with 9 and more raters (respectively .83 with 6 raters) is considered evidence of good content validity [18]. The I-CVIs ranged between 0.66 and 1.00 in the German version, 0.83 and 1.00 in the French, and 0.60 and 1.00 in the Italian version. Overall, most items had an I-CVI above 0.78. Exceptions were the rationing of bath and skin care in German (0.66) and Italian (0.67) and another three items in the Italian version: leave a resident in urine/stool longer than 30 minutes (0.67), toileting/continence training (0.60), and cultural activity (0.67). Except for the last item about cultural activity, all other activities are integral parts of the legal mandate of nursing homes. The S-CVI/Ave was calculated for the subscales found in the exploratory factor analyses described below (cf. phase 3). In the

German version, all S-CVI/Ave were above 0.90. In the French version, they ranged between 0.89 (Documentation) and 0.93. In the Italian version three of four scales were below the threshold of 0.90 (ADL: 0.83, Caring, rehabilitation, and monitoring: 0.87, Documentation: 0.93, Social care: 0.78). In order to keep the instrument congruent in the three language versions und since no item had a poor rating, no items were deleted based on an I-CVI below the threshold. However, the text of all 4 Italian items was adapted to ensure comprehensibility by using language closer to daily use and making statements more explicit.

Afterwards, the questionnaires were discussed in focus groups with end users of all educational levels in the three languages to assure comprehensibility. Based on the focus group interviews, difficult expression were replaced such as "psychosocial support" (see Table 3, item 7) or "rehabilitation" (item 10), and two items were expanded with examples to improve understanding (item. 10: explanation of activating care and item 11: kind of situations when monitoring of residents is needed).

4.4.3. Phase 3: Testing aspects of validity and reliability

Design, Setting, and Sample

For testing the validity and reliability of the BERNCA, we used survey data of 162 nursing homes from the Swiss Nursing Homes Human Resources Project (SHURP) [19]. SHURP is a representative, national, cross-sectional study in all three language regions of Switzerland (German, French, and Italian) aiming at gaining a comprehensive understanding of the relationship between organizational and work environment characteristics, implicit rationing of nursing care, and care worker as well as resident outcomes. Nursing homes were randomly selected out of a total sample of 1331 nursing homes with 20 beds or more in Switzerland and stratified according to the three language regions and nursing home size (small: 20-49 beds, medium: 50-99 beds, large: 100 and more beds). A detailed description of the SHURP study with inclusion and exclusion criteria for nursing homes and care workers,

as well as data collection and management can be found elsewhere [19]. Data were collected between May 2012 and April 2013. From the SHURP sample, we included care workers of all educational backgrounds integrated in a care team, who worked at least for a month with a least 8h/week on their corresponding unit. Sending back the questionnaire to the research team was considered informed consent. The SHURP study was approved by all cantonal ethics committees of Switzerland.

Validity and Reliability Testing

The psychometric testing of the three language versions followed the American Education Research Association (AERA)'s standards for educational and psychological testing, providing different lines of evidence for the instrument's validity and reliability based on the research questions in Table 1 [20]. The first question about evidence based on test content was answered in phase 2. Statistical analyses were performed with IBM© SPSS© Statistics for Windows©, Version 21.0 software (Armonk, NY: IBM Corp.). Mplus 7.3 [21] was used for the exploratory factor analysis, since it allowed using the robust maximum likelihood parameter estimate (MLR) to account for item skewness and to model correlations of error terms.

Table 1: *Guiding research questions and hypotheses for the psychometric testing [20]*

Line of evidence:	Questions / Hypotheses:
Evidence based on test content:	Are the items relevant for the proposed interpretation of the test score (i.e. higher scores mean more implicit rationing of nursing care)?
Evidence for validity based on response processes:	What is the distribution of the items? What is the response variability? What is the acceptability of the scale? What percentage of respondents answers all questions? Do missing values differentiate care workers based on their professional background?
Evidence for validity based on internal structure:	What is the factor structure in the three language versions?
Evidence for reliability based on inter-item inconsistency:	Do the items within the scale correlate with each other? Does each item correlate with the test as a whole?
Evidence for reliability based on interscorer differences:	Do personnel on a unit agree regarding implicit rationing of nursing care? Is the scale a unit-level construct and are the units distinguishable?

Response processes: The distribution of the data was assessed with descriptive statistics (frequencies per response category). Response variability was considered low, if 80% or more of the respondents endorsed *never* [22]. Overall acceptability was checked by the percentage of respondents checking all items. The percentages of missing answers were calculated. Items with more than 5% missing were examined for significant differences based on professional background with Chi-Square tests.

Internal structure: Since the content of the BERNCA-NH was different from the original BERNCA, the internal structure of the scale was tested with exploratory factor analyses (EFA) using Geomin rotation. Each language version was tested separately. For EFA, a minimum sample size of 300 is recommended with a small number of factors with only 3-4 indicators per factor and low communalities [23]. The number of factors was explored based on Eigenvalues >1 and comparing different factor models with chi-square statistics. In the final models, chi-square statistics were expected to be below 2, goodness of fit measures to be above .90, and the root mean square error of approximation (RMSEA) below .05 [24]. In an accepted model, the path coefficients should load significantly on the corresponding factors.

Inter-item inconsistencies: Subscale reliabilities were calculated with Cronbach's Alpha. A value of .70 or higher was considered evidence for good factor consistency. Corrected item-to-total correlations were calculated to examine whether each item contributes to the measurement of implicit rationing of nursing care as a whole. Values above 0.2 were expected [22].

Interscorer differences: Although implicit rationing of nursing care is supposed to be an individual decision and priority setting, and the instrument is conceptualized to measure rationing at the individual level, nursing care is teamwork and some hospital studies show evidence that rationing might be a group-level construct [13, 25]. To assess whether the ratings of the individual persons within a unit were consistent and rationing could in fact be

understood as a group-level construct and whether groups means could be distinguished, four tests were applied: 1) the extent of agreement among personnel within a unit concerning the subscales identified was measured with $r_{WG(J)}$ [26], a measure of within-group agreement. Both uniform and moderately skewed expected distributions were tested [27]. The within-group agreement values should be 0.70 or greater [27]. 2) The extent to which the statistical variances between the individual ratings depend on their group membership was assessed with the ICC(1) (Intra-Class-Correlation), with a value above 0.05 suggesting that the nesting of respondents within units should be taken into account [28]. 3) The ICC(2) examined whether group means were reliable and could be distinguished from each other with values closer to 1.0 representing higher reliability [29]. 4) To assess whether the personnel's mean rating differed significantly between units, F-statistics with a one-way analysis of variance were calculated.

4.5.   Results

A total of 4748 nursing home care workers from the 3 Swiss language regions were included (German=3876, French=735, Italian=236) with an overall response rate of 76% (German=80%, French=75%, Italian=57%). About one third of respondents were registered nurses, half of them had less than 5 year experience in the current nursing home and their mean age was 43 years. Table 2 provides further descriptive results for the nursing homes, their units and the respondents.

Table 2: *Facility, unit, and respondent characteristics*

	Switzerland Total	German-speaking region	French-speaking region	Italian-speaking region
Facilities	(n=162)	(n=123)	(n=30)	(n=9)
Size, *%*				
Small	38.9	35.8	53.3	33.3
Medium	46.3	46.3	43.3	55.6
Large	14.8	17.9	3.3	11.1

	Switzerland Total	German-speaking region	French-speaking region	Italian-speaking region
Profit status, *%*				
Public	37.0	42.3	16.7	33.3
Private subsidized	26.5	15.4	66.7	44.4
Private	36.4	42.3	16.7	22.2
Units	**(n=427)**	**(n=352)**	**(n=53)**	**(n=22)**
Bed capacity, *median (IQR)*	24 (13)	24 (13)	24 (17)	28 (12)
FTE/100 beds, *median (IQR)*	50.8 (20.1)	49.8 (20.6)	56.7 (20.3)	50.0 (10.1)
Respondents	**(n=4847)**	**(n=3876)**	**(n=735)**	**(n=236)**
Age (in years), *mean (SD)*	43.1 (12.3)	43.2 (12.6)	42.6 (11.2)	43.5 (9.6)
Sex: female, *%*	91.6	92.6	89.7	82.4
Educational background, *%*				
Registered nurse	30.9	31.7	25.9	34.8
Licensed nurse	22.4	24.1	17.5	10.4
Nurse aide (1-2 year education)	17.5	13.2	31.5	45.2
Nurse aide (on the job training)	26.4	28.4	21.9	7.8
other	2.7	2.6	3.3	1.7
Tenure in actual nursing home, *%*				
Up to 5 years	52.7	55.3	46.8	28.4
5-10 years	21.0	20.3	23.4	24.3
10 and more years	26.3	24.3	29.8	47.3
Percentage of employment, *%*				
< 50%	20.0	21.8	13.4	10.8
51 – 90%	55.2	54.8	63.6	35.6
91 – 100%	24.9	23.5	23.0	53.6
Main shift, *%*				
Regular change of shifts	36.2	37.6	26.8	41.9
Day evening shift	58.4	57.0	66.1	55.9
Night shift	5.5	5.4	7.1	2.3

Notes: IQR: Interquartile range; SD: Standard deviation

4.5.1. Response processes

All items showed a skewed distribution, with less endorsement of higher frequencies

of rationing (see Table 3). The German and French version had no floor or ceiling effects. In

the Italian version two items had more than 80% of respondents answering *never*, showing

low response variability for assistance with food intake and assistance with drinking. As for

acceptability, 91% of the German-speaking respondents answered all items (5% left only 1

item out), 86% in the French version (6% left out 1 item) and 89% in the Italian version (6%

left out 1 item). Three items had consistently high numbers of missing in all language

versions: Item 15 about the set up and update of resident's care plans and items18 and 19 in

the subscale of social care. For the setup of care plans, missing were significantly different for

educational background in all language versions (German: X^2(4, N=3838) = 675.228, p<.001; French: X^2(4, N=727) = 36.969, p<.001; Italian: X^2(4, N=230) = 24.021, p<.001) with the main difference being lower missing among registered nurses (over all language versions ranging between 5% and 7%) in comparison to all other care workers (over all language versions ranging between 17% and 49%) . In the items about social care, a significant difference could be observed for cultural activities both in the German and Italian version (German: X^2(4, N=3838) = 25.422, p<.001; Italian: X^2(4, N=230) = 10.163, p=.038), and for group activities in the German version (X^2(4, N=3838) = 25.664, p<.001), all with higher missing values for nurse aides.

4.5.2. Internal structure

Based on eigenvalues, the German version had three and the French and Italian version four factors. In all language versions, Chi-square statistics significantly improved from a 3- to a 4-factor model and fit statistics were only acceptable in a 4-factor solution (see Table 4). In unchanged models, the two items about assistance in eating and drinking formed a single factor and correlated highly (German: r=.72, French: r=.68; Italian: r=.85). In the final models, a correlation of error terms of these two items was assumed, resulting in the four subscales presented in Table 4. Both CFI and TLF were above 0.9 and RMSEA below .05 in all language versions. Chi-square statistics were significant, which might partly be based on the high sample size in the German and French version. All items loaded significantly on their subscales. While the two subscales Social care and Documentation with three items each were clearly distinguished with factor loadings above 0.5 throughout, the two subscales ADL and Caring /Rehabilitation /Monitoring showed some cross-loadings in all language versions. The assignment of items 4 and 5 to the ADL subscale in spite of slightly higher loadings in the Caring subscale in both the German and French version was based on theoretical considerations, since together with items 1 to 3, they all represent support in activities of daily living.

4.5.3. Inter-item inconsistencies

The Cronbach's Alpha for all subscales in all language versions were in an acceptable range of 0.77 to 0.89, showing good inter-item consistency (see Table 4). Corrected item-to-total correlations were above 0.3 for all items in all language versions (results not shown).

4.5.4. Interscorer differences

As for the within-group agreement (r_{WG}), only items describing activities of daily living (items 1 to 5) reached the threshold of 0.7 in uniform distributions, all others ranked below. When a moderate skew was assumed, no item reached the threshold, showing a lack of agreement within teams about the frequency of rationing. The same holds true for the four subscales (see Table 5). However, based on the ICC(1) it would be necessary to account for the nestedness of the respondents within units: all scales were above the threshold of 0.05. F-Statistics showed significant differences between units except for two subscales in the Italian version, but ICC(2) showed that group means did not reliably distinguish between units (see Table 5).

Table 3: *Response patterns and missing values in the three languages versions of BERNCA-NH*

Factors and Items of BERNCA-NH	German version							French version							Italian version						
	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing
Activities of daily living (ADL)																					
1. Sponge bath / partial sponge bath / skin care	3828	3.1	56.2	26.6	11.7	2.4	1.2	708	4.2	41.7	32.2	19.1	2.8	3.7	234	0.9	77.8	13.2	7.7	0.4	0.8
2. Oral hygiene	3822	3.1	57.4	27.6	10.0	1.8	1.4	707	4.1	46.2	30.6	15.3	3.8	3.8	233	0.9	52.3	26.2	15.9	4.7	1.3
3. Assist food intake	3823	4.8	76.2	13.4	4.6	1.0	1.4	719	4.7	76.0	12.9	5.4	1.0	2.2	233	1.3	82.8	9.0	5.2	1.7	1.3
4. Assist drinking	3834	3.9	76.7	13.4	4.9	1.1	1.1	719	1.4	76.9	13.6	7.0	1.1	2.2	232	1.3	82.3	10.8	5.2	0.4	1.7
5. Mobilization / change of the position	3826	2.4	69.7	20.8	6.1	1.0	1.3	709	1.1	60.8	26.5	10.6	1.0	3.5	232	1.3	71.6	16.4	10.3	0.4	1.7
Caring, Rehabilitation, and monitoring																					
6. Leave a resident in urine / stool longer than 30 minutes	3820	2.8	69.9	21.9	4.8	0.6	1.4	710	1.4	60.0	30.0	7.0	1.6	3.4	234	1.3	79.0	13.7	4.7	1.3	0.8
7. Emotional support	3825	2.0	40.7	36.1	16.4	4.8	1.3	718	0.7	34.4	36.8	21.7	6.4	2.3	232	0.9	43.1	32.3	18.1	5.6	1.7
8. Necessary conversation with resident or family	3817	7.9	49.0	28.3	11.9	2.9	1.5	715	4.9	32.2	32.0	24.2	6.7	2.7	229	4.4	43.2	28.8	15.7	7.9	3.0
9. Toileting / continence training	3823	5.4	49.0	32.1	11.2	2.3	1.4	700	12.6	29.8	33.6	18.6	5.4	4.8	232	3.9	49.6	28.0	14.2	4.3	1.7
10. Activating or rehabilitating care	3821	3.9	35.5	36.2	18.5	5.9	1.4	713	3.8	29.6	34.9	22.3	9.4	3.0	232	1.7	37.5	32.3	19.4	9.1	1.7
11. Monitoring residents as care workers felt necessary	3817	6.9	47.9	28.4	13.5	3.3	1.5	718	1.4	32.4	36.4	23.4	6.4	2.3	231	1.7	55.4	22.5	14.3	6.1	2.1

Factors and Items of BERNCA-NH	German version							French version							Italian version						
	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing	Valid n	% activity not necessary	% never	% seldom	% sometimes	% often	% missing
Caring, Rehabilitation, and monitoring (cont'd)																					
12. Monitoring of confuse / cognitively impaired residents & use of restraints / sedatives	3782	9.1	46.2	26.1	14.8	3.8	2.4	700	3.4	49.6	29.4	14.0	3.6	4.8	230	1.3	47.0	30.0	15.6	6.1	2.5
13. Keep residents waiting who rung	3829	1.3	28.1	40.6	22.5	7.5	1.2	719	2.1	16.6	31.8	34.2	15.3	2.2	233	0.0	18.0	43.8	26.2	12.0	1.3
Documentation																					
14. Studying care plans at the beginning of shift	3812	1.4	33.6	31.1	21.3	12.6	1.7	716	2.1	19.8	30.9	27.2	20.0	2.6	233	0.9	45.9	26.6	16.7	9.9	1.3
15. Set up or update residents' care plans	2936	10.3	26.8	28.9	21.7	12.3	24.3	601	8.8	23.3	33.0	24.3	10.6	18.2	190	2.1	44.7	28.9	19.5	4.8	19.5
16. Documentation of care	3810	1.1	31.0	35.9	24.0	8.0	1.7	698	4.4	25.4	35.7	26.1	8.4	5.0	224	2.7	38.4	29.9	21.9	7.1	5.1
Social care																					
17. Scheduled single activity with a resident	3775	14.4	25.8	30.1	17.9	11.8	2.6	695	14.4	22.6	25.9	22.3	14.8	5.4	227	13.7	26.4	21.6	19.4	18.9	3.8
18. Scheduled group activity with several residents	3677	27.1	35.6	21.3	9.1	6.9	5.1	662	28.4	29.3	17.8	11.9	12.6	9.9	220	23.6	34.6	13.6	12.7	15.5	6.8
19. Cultural activity for residents with contact outside of nursing home	3643	34.5	34.2	16.0	7.7	7.6	6.0	651	29.0	29.2	17.4	9.5	14.9	11.4	214	29.4	33.2	11.7	9.8	15.9	9.3

Table 4: *Factor loadings, fit statistics of exploratory factor analyses and Cronbach's α for the final four-factor structure solution of the three language BERNCA-NH versions*

Factors and Items of BERNCA-NH	German version (n=3858)				French version (n=731)				Italian version (n=235)			
	1	2	3	4	1	2	3	4	1	2	3	4
Cronbach's Alpha of subscale	0.777	0.828	0.770	0.837	0.783	0.832	0.808	0.885	0.774	0.867	0.837	0.871
Activities of daily living (ADL)												
1. Sponge bath / partial sponge bath / skin care	0.589				0.517				0.348			
2. Oral hygiene	0.573				0.779				0.325	0.328		
3. Assist food intake	0.376				0.516				0.679			
4. Assist drinking	0.341	0.348			0.318	0.334			0.631			
5. Mobilization / change of the position	0.370	0.389			0.367	0.337			0.723			
Caring, Rehabilitation, and monitoring												
6. Leave a resident in urine / stool longer than 30 minutes		0.443				0.426			0.355	0.385		
7. Emotional support		0.733				0.831				0.564		
8. Necessary conversation with resident or family		0.648				0.637				0.717		
9. Toileting / continence training		0.585				0.364				0.717		
10. Activating or rehabilitating care		0.547				0.502				0.763		
11. Monitoring residents as care workers felt necessary		0.578				0.658				0.681		
12. Monitoring of confuse / cognitively impaired residents & use of restraints / sedatives		0.402				0.414				0.639		
13. Keep residents waiting who rung		0.295	0.289			0.369				0.377		
Documentation												
14. Studying care plans at the beginning of shift			0.588				0.620				0.746	
15. Set up or update residents' care plans			0.699				0.820				0.783	
16. Documentation of care			0.802				0.700				0.626	
Social care												
17. Scheduled single activity with a resident				0.572				0.609		0.253		0.594
18. Scheduled group activity with several residents				0.948				0.990				0.896
19. Cultural activity for residents with contact outside of nursing home				0.784				0.879				0.918

	German version (n=3858)	French version (n=731)	Italian version (n=235)
Fit statistics			
Chi-square	612.179‡	217.624‡	130.214*
Degrees of freedom	100	100	100
Comparative fit index (CFI)	0.974	0.972	0.981
Tucker-Lewis index (TLI)	0.955	0.953	0.967
Root mean square error of approximation (RMSEA) (90% CI)	0.036 (0.034-0.039)	0.040 (0.033-0.047)	0.036 (0.014-0.052)
Standardized root mean square residual (SRMR)	0.020	0.024	0.027

Notes: ‡ p<.001; *p<.05

Factor loadings <.250 are not shown; all loadings shown are significant at p<.05.

For the items 3 and 4 a correlation of error terms was assumed.

Table 5: *Measures of internal consistency and data nesting on unit level for 4 subscales of BERNCA-NH*

Measure	N units	$R_{WG(J).uniform}$ Mean	SD	$R_{WG(J).negatively\ skewed}$[a] Mean	SD	F ratio	ICC(1)	ICC(2)[b]
German version:	332							
Activities of daily living		0.77	0.12	0.49	0.25	2.11***	0.08	0.53
Caring, rehabilitation, and monitoring		0.65	0.12	0.26	0.22	3.27***	0.11	0.69
Documentation		0.49	0.18	0.10	0.18	2.76***	0.12	0.64
Social care		0.37	0.26	0.09	0.18	2.03***	0.08	0.51
French version:	50							
Activities of daily living		0.73	0.14	0.41	0.27	2.34***	0.07	0.57
Caring, rehabilitation, and monitoring		0.59	0.13	0.16	0.19	2.26***	0.07	0.56
Documentation		0.46	0.20	0.09	0.15	1.87***	0.07	0.47
Social care		0.24	0.24	0.04	0.10	1.90***	0.07	0.47
Italian version:	23							
Activities of daily living		0.76	0.16	0.49	0.27	1.68*	0.08	0.41
Caring, rehabilitation, and monitoring		0.60	0.13	0.19	0.16	1.02	0.05	0.02
Documentation		0.51	0.22	0.14	0.23	1.84*	0.10	0.46
Social care		0.23	0.27	0.06	0.14	1.38	0.08	0.27

Notes: SD=standard deviation of rWG(J) values; ICC=Intra-class correlation

[a] for the alternative null distribution, a moderate skew with σ2E=0.9 was assumed for all dimensions. Skewness expectations are based on the item distributions in hospital-based validation study of BERNCA [8]; variance estimations are taken from Biemann, Cole [27]

[b] Average cluster sizes for the ICC calculations were: German: 10.9, French: 13.5, Italian: 10.2

*** $p<0.001$; * $p<0.05$

4.6. Discussion

This study describes the development and psychometric testing of the German, French, and Italian-language nursing home version of the Basel Extent of Rationing of Nursing Care instrument, providing first evidence on the validity and reliability based on test content, response processes, internal structure, inter-item inconsistencies and interscorer differences. Our findings suggest that all three language versions of the BERNCA-NH are valid and reliable measures to assess implicit rationing of nursing care in Swiss nursing homes, although further refinements of selected items are needed.

Based on the expert feedback, almost all items cover relevant aspects of implicit rationing of nursing care. Scale content validities were good or acceptable in all language versions, with some S-CVI/Ave lying only slightly below the expected value of 0.90, except for the subscale social care in Italian (0.78). Here, especially the item about performing cultural activities together with residents had a lower content validity index of 0.67. The organization of work and provision of services in nursing homes in the three language regions might be quite different, especially in the area of social care. In some nursing homes, social care is provided by professional groups other than nurses or nurse aides (i.e., occupational therapists) and residents' relatives might be more involved in the Italian speaking region. Further inquiries into different care models in nursing homes might help to clarify this issue, and provide guidance in building a more representative subscale of social care in all language regions.

The distribution of responses over all answer options was good. Only two items were slightly above 80% for the answer option *never* in the Italian version concerning the rationing of helping with eating and drinking. Based on the distributions it is possible to distinguish activities that are more or less rationed than others. For example, items in the subscale documentation are rationed most often, followed by social care and caring, rehabilitation, and

monitoring and with less rationing in the area of activities of daily living. The response variability on subscales and single items gives nursing home managers helpful information on imbalances between resident care needs and available resources and on how care workers in nursing homes are setting priorities given the available resources. The instrument showed high acceptability with more than 90% of respondents answering all items or only leaving 1 item out. As expected, the item about setting up care plans showed a high missing rate, with registered nurses having the lowest percentage of missing, since it is their assigned task. Additionally, the items about social care showed higher missing rates. This might be related to the fact that the organization of social care varies between nursing homes and language regions (lower missing values in the German part than in the French and Italian part) with some care workers not having responsibility in this area. This confirms the necessity to revise the social care subscale as suggested above.

In contrast to the original BERNCA one-factor version, BERNCA-NH shows multiple factors. The three language versions provided almost identical factor structures, with robust solutions for the subscales social care and documentation. The other two subscales activities of daily living and caring, rehabilitation, and monitoring showed some cross-loadings, but based on theoretical considerations, items could be clearly assigned to their corresponding factor. For the items about rationing of helping with eating and drinking, a correlation of error terms had to be assumed; they should be collapsed to one item in future versions of the BERNCA-NH. Though the original BERNCA showed a one-factor structure, the Chi-Square statistics for the comparison of 1-, 2-, and 3- factor models with the 4-factor model showed a clear superiority of the latter for the BERNCA-NH. Since the items about social care were an addition to the original BERNCA and represent a different aspect of care, they could be expected to form a separate factor. The clear separation of documentation as a different factor in the nursing home setting might be based on the perception of staff that rationing of documentation actually might help to ration less other activities directly related to resident

care. This differentiation of documentation from other factors can be seen in an examination of the relationship of all four factors with quality of care [30], where more rationing of documentation was related to better quality of care, while more rationing of caring with worse quality. The four-factor structure helps thus to differentiate between areas of rationing with different meanings for care workers and different frequencies of rationing, as seen in Table 3. Additionally, the themes might also be handled differently: certain activities might be postponed, shortened or delegated before they are rationed, lowering the frequency of rationing, as e.g. the support in activities of daily living, which might be easier to postpone, shorten or delegate than a necessary conversation. The diversification of rationing provides, thus, the opportunity to examine the effect of specific areas of rationing on different outcomes.

All scales show good internal consistency with Cronbach's Alpha above 0.75, and all items discriminate well between respondents with different frequencies of rationing with item-to-total correlations higher than 0.3. All items, thus, well-represent implicit rationing of nursing care, although this does not mean that the instrument covers all important aspects of rationing. When comparing the content of BERNCA-NH with the recent overview of themes in other instruments measuring unfinished care by Jones, Hamilton & Murry [10], it lacks items about treatments, tests, and procedures. Many procedures are of limited frequency in nursing homes, but based on anecdotal evidence from discussing the results with the participating nursing homes, they felt there should an item about rationing in the administration of medications, which is actually included in the revised hospital version of BERNCA. Further items about treatments, test and procedures need to be explored with nursing home experts.

Evidence based on interscorer differences shows that BERNCA-NH items and subscales should be analyzed at the individual level and not be aggregated to unit level. Almost all r_{WG} -values were below 0.7. This is unlike the results from Ausserhofer and

colleagues [13] who calculated an r_{WG} -value of 0.80 for the original BERNCA at the unit level. ICC(2) values confirm that means on the unit level are not reliable measures for rationing in nursing homes. Although the respondents did not rate exactly the same situations, a similar pattern of rationing might be expected given the rather low resident turnover in nursing homes and the short survey time of 4-6 weeks per unit. The low within-group agreement concerning rationing of care in nursing homes might be a sign that care workers, which have different educational backgrounds, tasks and responsibilities are not discussing rationing activities so that no common understanding of rationing develops. It would be interesting to examine whether teams with higher teamwork and collaboration scores have a higher within-group agreement. Despite the lack of agreement, findings on the ICC(1) and ANOVA show that considerable variance is explained by unit-membership and that units are statistically distinguishable, which makes is necessary to apply multilevel modeling and to statistically control for the nestedness of respondents.

Overall, the results show a valid and reliable instrument to measure implicit rationing of nursing care in Swiss nursing homes. As a practical implication for nursing homes, the monitoring of trends concerning the rationing with this instrument could help to identify areas prone to withholding needed care and to intervene in order to reduce adverse outcomes of rationing. Nonetheless, further research is needed to specify more representative items for all language regions for the social care scale, the items about eating and drinking might be collapsed to one, and an item about medication administration should be added to the instrument. Additionally, we do not know the importance of rationing of care for residents and how they and their relatives perceive it. Further studies are needed to explore nursing home residents' views of rationing.

The strength of this study is its sample size, which gives its internal structure a solid basis. A limitation is the potential for response bias, since care workers might be reluctant to report the actual level of rationing. However, questionnaires were distributed with pre-

stamped envelopes to send them back directly to the research team and confidentiality was guaranteed; the nursing home managements had no access to answers of individual care workers.

4.7. Conclusion

This study provides first evidence for a nursing home version of the BERNCA in the three languages: German, French, and Italian. All versions are psychometrically sound and can be used in Swiss nursing homes to assess and monitor the level of implicit rationing of nursing care for research and quality development purposes. However, further refinement is advisable, especially to better represent the basic tasks in social care in the three language regions. The international use of the BERNCA-NH is recommended, yet rigorous cross-cultural translation and adaptation is needed.

4.8. Acknowledgements

4.9. Conflict of interest

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4.11. References

1. Tragakes, E. and Vienonen, M. (1998). *Key issues in rationing and priority setting for health care services*. WHO Regional Office for Europe.
2. Nelson, S. T. and Flynn, L. (2015). Relationship between missed care and urinary tract infections in nursing homes. *Geriatric Nursing*, *36*(2), 126-130.
3. Künzi, K. and Schär Moser, M. (2002). *Die Arbeitssituation im Pflegebereich im Kanton Bern*. Bern: Gesundheits- und Fürsorgedirektion des Kantons Bern.
4. Morin, D. and Leblanc, N. (2005). Less money, less care: How nurses in long-term care allocate hours of needed care in a context of chronic shortage. *International Journal of Nursing Practice*, *11*(5), 214-20.
5. Bergmark, A., Parker, M. G. and Thorslund, M. (2000). Priorities in care and services for elderly people: A path without guidelines? *Journal of Medical Ethics*, *26*(5), 312-8.
6. Nortvedt, P., Pedersen, R., Grothe, K. H., Nordhaug, M., Kirkevold, M., Slettebø, Å., Brinchmann, B. S. and Andersen, B. (2008). Clinical prioritisations of healthcare for the aged - professional roles. *Journal of Medical Ethics*, *34*(5), 332-5.
7. Santos-Eggimann, B. (2005). *Is there evidence of implicit rationing in the Swiss health care system?* Lausanne: Health Services Research Unit, University of Lausanne, Institute of Social and Preventive Medicine.
8. Schubert, M., Glass, T. R., Clarke, S. P., Schaffert-Witvliet, B. and De Geest, S. (2007). Validation of the Basel Extent of Rationing of Nursing Care instrument. *Nursing Research*, *56*(6), 416-24.
9. Breyer, F. (2012). Implizite versus explizite Rationierung von Gesundheitsleistungen. *Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz*, *55*(5), 652-659.
10. Jones, T. L., Hamilton, P. and Murry, N. (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *International Journal of Nursing Studies*, *52*(6), 1121-1137.
11. Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M. and De Geest, S. (2008). Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, *20*(4), 227-37.
12. Schubert, M., Clarke, S. P., Aiken, L. H. and De Geest, S. (2012). Associations between rationing of nursing care and inpatient mortality in Swiss hospitals. *International Journal for Quality in Health Care*, *24*(3), 230-8.
13. Ausserhofer, D., Schubert, M., Desmedt, M., Blegen, M. A., De Geest, S. and Schwendimann, R. (2013). The association of patient safety climate and nurse-related organizational factors with selected patient outcomes: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(2), 240-52.
14. Schubert, M., Ausserhofer, D., Desmedt, M., Schwendimann, R., Lesaffre, E., Li, B. and De Geest, S. (2013). Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals — a cross sectional study. *International Journal of Nursing Studies*, *50*(2), 230-239.
15. Zimmermann-Sloutskis, D., Moreau-Gruet, F. and Zimmermann, E. (2012). *[Comparison of the quality of life of eldery people living at home or in an institution (Obsan Rapport 54)]*. Neuchâtel: Schweizerisches Gesundheitsobservatorium.
16. Robichaud, L., Durand, P. J., Bedard, R. and Ouellet, J. P. (2006). Quality of life indicators in long-term care: Opinions of elderly residents and their families. *Canadian Journal of Occupational Therapy*, *73*(4), 245-51.
17. Maneesriwongul, W. and Dixon, J. K. (2004). Instrument translation process: A methods review. *Journal of Advanced Nursing*, *48*(2), 175-86.

18. Polit, D. F., Beck, C. T. and Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing and Health*, *30*(4), 459-67.

19. Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and De Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

20. American Educational Research Association, American Psychological Association and National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: American Psychological Association.

21. Muthén, L. K. and Muthén, B. O., *Mplus Version 6.1*. 1998-2010, Muthén & Muthén: Los Angeles, CA.

22. Streiner, D. L. and Norman, G. R. (2008). *Health measurement scales. A practical guide to their development and use*. New York: Oxford University Press.

23. MacCallum, R. C., Widaman, K. F., Zhang, S. and Hong, S. (1999). Sample size in factor analysis. *Psychol Methods*, *4*(1), 84-99.

24. Raykov, T. and Marcoulides, G. A. (2011). *Introduction to psychometric theory*. New York: Routledge.

25. Castner, J., Wu, Y.-W. B. and Dean-Baar, S. (2015). Multi-level model of missed nursing care in the context of hospital merger. *Western Journal of Nursing Research*, *37*(4), 441-461.

26. James, L. R., Demaree, R. G. and Wolf, G. (1993). Rwg: An assessment of within-group interrater agreement. *Journal of Applied Psychology*, *78*(2), 306-309.

27. Biemann, T., Cole, M. S. and Voelpel, S. (2012). Within-group agreement: On the use (and misuse) of rWG and rWG(J) in leadership research and some best practice guidelines. *The Leadership Quarterly*, *23*(1), 66-80.

28. Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Press.

29. Portney, L. G. and Watkins, M. P. (2009). *Foundations of clinical research. Applications to practice*. Upper Saddle River, New Jersey: Pearson Education.

30. Zúñiga, F., Ausserhofer, D., Hamers, J. P. H., Engberg, S., Simon, M. and Schwendimann, R. (2015). Are Staffing, Work Environment, Work Stressors, and Rationing of Care Related to Care Workers' Perception of Quality of Care? A Cross-Sectional Study. *Journal of the American Medical Directors Association*, (Advance online publication).

CHAPTER 5

THE RELATIONSHIP OF STAFFING AND WORK ENVIRONMENT WITH IMPLICIT RATIONING OF NURSING CARE IN SWISS NURSING HOMES – A CROSS-SECTIONAL STUDY

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5.1. Abstract

Background. Implicit rationing of nursing care refers to the withdrawal of or failure to carry out necessary nursing care activities due to lack of resources, in the literature also described as missed care, omitted care, or nursing care left undone. Under time constraints, nurses give priority to activities related to vital medical needs and the safety of the patient, leaving out documentation, rehabilitation, or emotional support of patients. In nursing homes, little is known about the occurrence of implicit rationing of nursing care and possible contributing factors.

Objectives. The purpose of this study was 1) to describe levels and patterns of self-reported implicit rationing of nursing care in Swiss nursing homes and 2) to explore the relationship between staffing level, turnover, and work environment factors and implicit rationing of nursing care.

Design: Cross-sectional, multi-center sub-study of the Swiss Nursing Home Human Resources Project (SHURP).

Settings. Nursing homes from all three language regions of Switzerland.

Participants. A random selection of 156 facilities with 402 units and 4,307 direct care workers from all educational levels (including 25% registered nurses).

Methods. We utilized data from established scales to measure implicit rationing of nursing care (Basel Extent of Rationing of Nursing Care), perceptions of leadership ability and staffing resources (Practice Environment Scale of the Nursing Work Index), teamwork and safety climate (Safety Attitudes Questionnaire), and work stressors (Health Professions Stress Inventory). Staffing level and turnover at the unit level were measured with self-developed questions. Multilevel linear regression models were used to explore the proposed relationships.

Results. Implicit rationing of nursing care does not occur frequently in Swiss nursing homes. Care workers ration support in activities of daily living, such as eating, drinking,

elimination and mobilization less often than documentation of care and the social care of nursing homes residents. Statistically significant factors related to implicit rationing of care were the perception of lower staffing resources, teamwork and safety climate, and higher work stressors. Unit staffing and turnover levels were not related to rationing activities.

Conclusions. Improving teamwork and reducing work stressors could possibly lead to less implicit rationing of nursing care. Further research on the relationship of implicit rationing of nursing care and resident and care worker outcomes in nursing homes is requested.

5.2. Introduction

Nursing home residents' overall care dependency and the complexity of their medical situation is increasing [1]. In developed countries, a median of 58% of nursing home residents have dementia, among which 78% show behavioral and psychological symptoms [2]. Nursing home care workers are increasingly challenged to provide high quality of care, given the different and often simultaneous needs of their residents and dealing with dementia-related symptoms. At the same time, staffing resources are often held constant or are even diluted by replacing registered nurses with lesser skilled personnel to contain rising health care spending and to confront the increasing recruitment problem of qualified personnel [3-6].

The lack of nursing resources (staffing, skill mix, time) can result in the withholding of or failure to carry out necessary nursing activities. Different terms are used in the literature to conceptualize this failure, such as nursing care left undone, missed care, omitted care, or implicit rationing of nursing care. Missed or omitted care – terms mainly used by Kalisch and her team [7] – have their roots in a patient safety framework, where they are considered an error of omission that might lead to adverse outcomes. The term implicit rationing of nursing care, which will be used in this study, was coined by Schubert and colleagues [8] and is based on the general discussion of rationing in healthcare as the allocation of limited resources with the consequence of having to withhold beneficial measures from some individuals. The decision to ration is an implicit, forced in-the-moment choice of an individual healthcare worker to not carry out certain nursing activities in the face of constrained resources. To date, very few studies have explored implicit rationing of nursing care in the nursing home sector.

Surveys in different healthcare settings in the US and European countries have shown similar patterns of implicit rationing of nursing care. In acute care hospitals, nursing activities related to vital medical needs and the safety of patients, treatments and procedures, and delegated tasks from medical staff were less often left undone, while activities such as communication and support of patients, documentation, patient education and discharge

planning, skin care, ambulation, and hygiene were rationed more often [7, 9-12]. Two nursing home studies provide initial evidence for a similar pattern: care workers lacked time for comforting and talking to residents, personal care, mobilization, hygiene, and monitoring, while they seldom rationed treatment and diagnostic procedures, ensured feeding and elimination functions, and cared for their patients' safety [13, 14].

Implicit rationing of nursing care is not just an individual choice of each care worker but also depends on the organizational and social context [8]. Influencing factors can be classified into facility and unit characteristics, work environment, care worker characteristics, and patient/resident and family characteristics (cf. Figure 1). Only factors belonging to the last group have been examined in the nursing home sector to date.

Considering *facility and unit characteristics,* higher patient-to-nurse ratios, a higher turnover of patients (e.g. admissions and discharges), unexpected increases in patient volume or acuity, and the lack of an adequate number of assistive personnel added to workload and made it necessary to ration care [10, 15-18]. Higher nurse turnover might be an additional contextual factor related to heightened rationing of care [18]. However, in most previous studies self-reported staffing data were collected and not actual staffing numbers. One study found that higher nursing hours per patient day (HPPD) were related to less missed care [19]. In another study, however, hospitals with Magnet vs. non-Magnet status were compared; not having Magnet status predicted more missed care, even though the hospitals did not differ in their staffing levels [20]. This points to the importance of a second group of influencing factors, the work environment.

Work environment includes such aspects as leadership, staffing and resources adequacy, and nurses' participation on hospital affairs. Excellent work environment ratings are a distinguishing characteristic of Magnet hospitals. Several studies showed that perceptions of a poor work environment, teamwork, communication, and safety climate were

related to higher rationing of care [10, 15, 21-24]. Accordingly, the search for factors influencing rationing of care should include staffing as well as work environment aspects.

The relationship between *care worker characteristics* and rationing of care remains unclear: mixed results were found concerning gender, age, employment percentage, educational background, professional tenure, usual shift, or absenteeism [7, 10, 19, 24]. Overall, care worker characteristics seemed less important factors associated with rationing of care. So far, two nursing home studies looked at *patient and family characteristics.* In an observational study in four nursing homes in the US, higher rationing of care was related to residents' physical dependence and need for help from more than one care worker during mobilization, incontinence care, and dressing [25]. When residents resisted assistance in oral care, 95% of care workers in 11 Norwegian nursing homes left the activity undone, making resistance to care an important factor for omission of care, though this is not directly linked to time constraints [26].

To our knowledge, no study so far has comprehensively examined the occurrence of implicit rationing of care and possible contributing factors such as staffing levels or work environment factors in the long-term care setting, such as nursing homes. The aims of this study were thus 1) to describe levels and patterns of self-reported implicit rationing of care in Swiss nursing homes, and 2) to explore the relationship between staffing level, turnover, and work environment factors and implicit rationing of nursing care.

5.3. Methods

5.3.1. Setting and sample

This is a sub-study of the Swiss Nursing Home Human Resources Project (SHURP). SHURP is a cross-sectional, multi-center study with a representative sample of 163 randomly selected nursing homes. Switzerland has close to 1560 nursing homes with a median size of 59 beds [27]. They offer a variety of services, such as long-term care, short stays, adult day care, and

post-acute care, including rehabilitation, different home-like environments for people with dementia, gerontopsychiatry, or specialized palliative care [28]. Depending on their size, nursing homes are typically organized with several care units staffed with fixed core teams responsible for a given number of residents. The mean number of residents per unit is 29 [28]. Residents have a mean age of 81 years at admission and stay on average for 3 years [27]. The sampling was stratified according to three Swiss language regions (German, French, Italian) and the size of the nursing home (small: < 50 beds, medium: 51-99 beds, large: 100 beds and more). Further details of the main study are described elsewhere [29]. Included in this sub-study were 156 nursing homes that provided full data on the organizational characteristics examined. In each nursing home, care workers of all educational levels (e.g. registered nurses, licensed practical nurses, nurse aides) were included in the questionnaire survey if they worked in direct care of the nursing home residents for at least 8 hours a week. Respondents with a leadership position were excluded, since their daily routine differs from other care workers.

5.3.2. Variables and measurement

Data were collected from three sources: (1) care workers completed questionnaires to assess implicit rationing of nursing care, the work environment, and care worker characteristics; (2) nursing home director completed questionnaires about facility and unit characteristics, and (3) administrative database provided information about resident characteristics (cf. Figure 1 for an overview of all variables).

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┌─────────────────────────────────┐   ┌─────────────────────────────────┐
│ Facility characteristics        │   │ Care worker characteristics     │
│ – Language region*              │   │ – Gender*                       │
│ – Nursing home / unit size*     │   │ – Age*                          │
│ – Profit status*                │   │ – Educational background*       │
│                                 │   │ – Usual shift*                  │
│ Unit characteristics            │   └─────────────────────────────────┘
│ – Size                          │   ┌─────────────────────────────────┐
│ – Staffing level (FTE/100 beds) │   │ Implicit rationing of nursing   │
│ – Staff turnover rate           │   │ care                            │
└─────────────────────────────────┘   │ – Activities of daily living    │
┌─────────────────────────────────┐   │ – Caring, rehabilitation, and   │
│ Work environment                │   │   monitoring                    │
│ – Nurse manager ability,        │   │ – Documentation                 │
│   leadership, and               │   │ – Social care                   │
│   support of nurses (leadership)│   └─────────────────────────────────┘
│ – Staffing and resources        │   ┌─────────────────────────────────┐
│   adequacy (staffing)           │   │ Resident characteristics:       │
│ Teamwork and safety climate     │   │ – Mean age*                     │
│ Work stressors                  │   │ – Mean length of stay*          │
│ – Conflict and lack of          │   │ – Mean care load*               │
│   recognition                   │   └─────────────────────────────────┘
│ – Workload                      │
│ – Lack of preparation           │   ┌─────────────────────────────────┐
└─────────────────────────────────┘   │ Resident outcomes               │
                                       │ (not part of this study)        │
                                       └─────────────────────────────────┘
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*control variables

Figure 1: *Factors influencing implicit rationing of care*

The care worker questionnaire used established scales. All items of the care worker questionnaire were translated into German, French, and Italian, verified by comparison of its back-translation with the original language version [30], tested for relevance with experts in the field to check the content validity [31], and pretested for their comprehensibility with end-user focus groups.

Outcome variable - Implicit rationing of nursing care (BERNCA-NH). For the measurement of implicit rationing of nursing care, the Basel Extent of Rationing of Nursing Care (BERNCA) instrument [8] was adapted to the nursing home sector. Three questions about the rationing of social care, which are important promoters of the quality of life of nursing home residents, were added to the original instrument [32, 33]; items not relevant to the nursing home setting were removed. This resulted in a 19-item nursing home version of the BERNCA. Care workers were asked, how often in the last seven days they could not perform certain care activities that were necessary and usual, due to lack of time or high workload. Items were rated on a 5-point Likert scale from "0=activity was not necessary",

"1=never" to "4=often", with an additional answer option "not within my competence" for activities not performed by nurse aides (e.g. set up care plans). Exploratory factor analysis performed with this study's sample showed a 4-factor structure of the BERNCA-NH, grouping items into four subscales (see Table 1 for complete listing of items per scale): activities of daily living (five items); caring, rehabilitation, and monitoring (eight items); documentation (three items); and social care (three items). Cronbach's α for the four subscales ranged between 0.76 and 0.94. For analysis, the mean over all items per subscale was calculated.

Table 1: *Frequency of implicit rationing of nursing care in Swiss nursing homes*

	Ranking[a]	Often (%)	Some-times (%)	Rarely (%)	Never (%)	Not required (%)
Activities of daily living (ADL)						
Sponge bath / partial sponge bath / skin care	14	2.2	12.2	26.4	53.4	5.6
Oral hygiene	15	2.1	10.8	27.0	54.1	6.0
Assist food intake	19	1.0	4.3	13.3	73.8	7.6
Assist drinking	17	1.2	4.9	13.3	76.8	3.7
Mobilization / change of the position	16	1.0	6.9	21.5	68.4	2.2
Caring, Rehabilitation, and monitoring						
Leave a resident in urine / stool longer than 30 minutes	18	0.8	5.2	23.4	68.0	2.6
Emotional support	7	5.0	17.2	35.2	40.8	1.8
Necessary conversation with resident or family	10	3.7	13.5	28.8	45.1	9.0
Toileting / continence training	13	2.7	12.3	32.2	45.8	7.0
Activating or rehabilitating care	6	6.3	18.1	34.9	34.1	6.7
Monitoring residents as care workers felt necessary	9	3.9	15.2	29.3	45.7	5.9
Monitoring of confuse / cognitively impaired residents & use of restraints / sedatives	8	4.0	15.5	26.9	45.6	8.0
Keep residents waiting who rung	2	9.1	25.2	39.8	24.4	1.4
Documentation						
Studying care plans at the beginning of shift	1	13.4	22.0	31.2	31.9	1.4
Set up or update residents' care plans	4	9.8	20.1	29.0	28.0	13.1
Documentation of care	3	7.3	23.7	35.8	31.4	1.8

	Ranking[a]	Often (%)	Some-times (%)	Rarely (%)	Never (%)	Not required (%)
Social care						
Scheduled single activity with a resident	5	11.9	17.2	27.7	24.9	18.3
Scheduled group activity with several residents	11	7.5	9.1	19.3	33.8	30.3
Cultural activity for residents with contact outside of nursing home	12	8.5	7.2	15.4	32.4	36.4

[a] Ranking is based on the sum of "often" and "sometimes" with higher ranking meaning more frequent rationing

Work environment: Nurse manager ability, leadership, and support of care workers and *Staffing and resources adequacy.* Two subscales of the Practice Environment Scale – Nursing Work Index (PES-NWI) [34] were used to measure "Nurse Manager Ability, Leadership, and Support of Care Workers" (henceforth called leadership) and "Staffing and Resources Adequacy". Items were rated on a 4-point agreement Likert scale (from 1="strongly disagree" to 4="strongly agree"). The 5-item leadership subscale included statements such as "A supervisory staff that is supportive of the care workers," "A nurse/unit manager who is a competent leader," or "Praise and recognition for a job well done". Cronbach's α was 0.84. We used an adapted version of the Staffing and resources adequacy subscale with three of the four original items, e.g. "Enough staff to get the work done". One item was removed because it was not applicable to the nursing home setting. Cronbach's α was 0.74. For analysis, the mean over all items per subscale was calculated.

Work environment: Teamwork and resident safety climate. The Safety Attitudes Questionnaire (SAQ) [35] was used to measure teamwork and resident safety climate. The original instrument included the two subscales "Teamwork" and "Safety Climate" with a total of 13 items. In the psychometric analysis, three items showed low item discrimination (corrected item-scale correlation < 0.4) and were not well represented by the scales. After deletion of the three items, the two original subscales merged to one. Accordingly, in this analysis a combined factor of Teamwork and Resident Safety Climate with a total of 10 items was used; Cronbach's α was 0.89. Items were rated on a 5-point Likert scale ranging from

1=strongly disagree to 5=strongly agree with the option "don't know". They covered such themes as "Input is well received in this unit", "I have the support I need from other personnel to care for residents", or "As a resident, I would feel safe being treated in this unit".

Work environment: Work stressors were measured with a selection of items from the Health Professions Stress Inventory (HPSI) [36, 37]. To reduce the survey burden, the original instrument with four subscales was shortened from 30 to 12 items based on expert ratings concerning the relevance of the items for the nursing home setting. Care workers were asked how often they felt stressed because of different work stressors. Answer options ranged from 0=never to 4=very often on a 5-point Likert scale. The psychometric analysis of the 12 items produced three factors. "Workload" included three items about staffing and challenging situations, as e.g. "…because you have so much work to do everything cannot be done well?". The factor "Conflict and lack of recognition" describes six stressors related to conflict with superiors or with other professions, and about not being asked about one's opinion, and not being paid enough. The third factor addresses the "lack of preparation", with three items about being overwhelmed when caring for terminally ill residents, not being prepared to meet residents' needs, and fear of making mistakes. Cronbach's alpha for the three factors ranges between 0.63 (lack of preparation) and 0.76.

Care worker characteristics. Additionally, gender, age (years), and usual shift (day or evening shift, night shift, regular change of shifts) were assessed in the care worker questionnaire and used as control variables. Four specific educational backgrounds were identified: 1) registered nurses (3-4 years of education), 2) licensed practical nurses (3 years of education), 3) certified nurse aides (1-2 years of education), and 4) nursing aides with on the job training or short courses. Other professions were subsumed in the category "other".

Additionally, facility, unit, and resident characteristics were measured as either influencing factors or control variables (s. Figure 1). *Facility characteristics* included information about the language region (German, French, Italian), ownership status (public,

public-subsidized, private), and nursing home size (small: < 50 beds, medium: 51-99 beds, large: 100 beds and more). *Unit characteristics* included the number of beds, percentage of residents with either diagnosed dementia or symptoms of dementia, full-time equivalent (FTE) of all staff on the unit transformed into comparable numbers of FTE/100beds, and the overall staff turnover per unit. Turnover was calculated as the number of persons who left the team in the last six months in relation to the number of persons present in the team at the time of data collection. *Resident characteristics* included age (years), length of stay (days), and resident care load and were collected from the administrative database. For resident care load, the national classification system used to receive reimbursement from health insurance companies was used. Each nursing home resident in Switzerland is allocated to one of 12 reimbursement groups, where each higher group represents an increase of 20 minutes in care time. All variables were used to control for differences between units based on this resident care load mix.

5.3.3. Data collection and data management

The survey was available in the three languages - German, French, and Italian, and administered between May 2012 and April 2013. Details concerning data collection are described elsewhere [29]. Nursing home administrators or directors of nursing of all participating nursing homes gave written confirmed consent for study participation. The study was approved by all Swiss cantonal ethics committees. The return of the care worker questionnaires was considered informed consent. Data was entered into IBM[©] SPSS[©] for Windows[©], Version 21.0 software (Armonk, NY: IBM Corp.) and checked for plausibility and consistency.

5.3.4. Data analysis

To describe the frequency of implicit rationing of nursing care, as well as the facility and unit characteristics, work environment, nursing home resident, and care worker

characteristics, descriptive statistics (percentages, means, and standard deviations (SD)) were used.

To explore the relationship between staffing level, turnover, and work environment factors and implicit rationing of nursing care, multiple regression analysis was used. Some of the work environment factors in the analysis represent unit level constructs, among them leadership, staffing and resources adequacy, and teamwork and safety climate. Based on the between-group variance among units and facilities of these variables and their intraclass correlation 1 (ICC1) [38, 39], it was necessary to apply multilevel modeling to account for the nestedness of personnel within units and facilities (cf. Table 2 for details). Additional testing of intraclass correlation 2 (ICC2) and within-group agreement (r_{WG}) showed that it was not recommendable to aggregate the individual ratings to unit level [40, cf. Table 2]. Accordingly, a multilevel analysis was performed with the individual care workers at level 1 and units and facilities as random intercepts at level 2 and 3. Two models were built for each of the four BERNCA-NH subscales, one unadjusted and one adjusted for facility, unit, resident, and care worker characteristics (cf. Figure 1). Based on the test for multicollinearity with the Variance Inflation Factor (VIF), all values were below five and no predictor was excluded from the models [41]. Akaike's information criterion (AIC) was used to evaluate the relative model fit of the different models, where lower values meant better model fit [41]. Relationships were considered significant at the $p<.05$ level. Listwise deletion for missing was applied. Data analyses were performed with IBM© SPSS© Statistics for Windows©, Version 21.0 software (Armonk, NY: IBM Corp.) and Stata/IC 13.1. A post-hoc analysis concerning the relationship of staffing levels and staffing and resources adequacy was performed with a univariate multilevel regression model. In a sensitivity analysis, the multivariate multilevel regression model was complemented with variables concerning the burden of short- and long-term absences for a team to evaluate their impact on rationing.

Table 2: *Nestedness of individual data within units and facilities: test results*

Measure	n^a	F ratio	ICC(1)	ICC(2)	$R_{WG(J),uniform}$			$R_{WG(J),negatively\ skewed}$ [b]		
					Mean	SD	σ^2_E	Mean	SD	σ^2_E
Unit level:										
Leadership	479	4.45**	0.26	0.76	0.62	0.18	2.00	0.49	0.22	0.9
Staffing and resources adequacy	479	3.93**	0.23	0.73	0.56	0.19	2.00	0.41	0.22	0.9
Teamwork and safety climate	479	2.92**	0.12	0.64	0.62	0.17	2.00	0.45	0.21	1.34
Facility level:										
Leadership	156	6.34**	0.18	0.84	0.59	0.15	2.00	0.43	0.19	0.9
Staffing and resources adequacy	156	6.70**	0.20	0.85	0.54	0.13	2.00	0.37	0.17	0.9
Teamwork and safety climate	156	3.74**	0.09	0.73	0.60	0.13	2.00	0.30	0.14	1.34

Notes: SD=standard deviation of $r_{WG(J)}$ values, σ^2_E=expected variance of distribution
ICC(1)=intra-class correlation 1 (reliability of individual-level scores as representative of the group), expected value: ≥ 0.05 [40]
ICC(2)=intra-class correlation 2 (reliability of group-mean score to distinguish among groups), expected value: ≥ 0.70 [40]
R_{WG} =measure of within-group agreement, expected value: ≥ 0.70 [40]
[a] Unit level: number of teams, including night shift and activation teams
[b] for the alternative null distribution, a slight skew was assumed for all scales. Skewness expectations are based on the item distributions in the literature; variance estimations (σ^2_E) are taken from Biemann et al. [39]
** $p<0.01$

5.4. Results

5.4.1. Sample

The sample for this sub-study consisted of 4,307 respondents from 402 care units and 74 additional teams not bound to a specific unit (e.g. night shift team) in 156 nursing home facilities from all three language regions in Switzerland. The mean response rate over all facilities was 78%, ranging from 40% to 100%. Three quarters of the facilities were located in the German speaking part of Switzerland, with about equal proportions of private, private subsidized and public ownership. Units had the mean of 25 beds with an FTE of 51.8 per 100 beds (Table 3). The work environment ratings were high for leadership with an average rating of 3.14, which is located just above "rather agree" (scale range 1-4) and teamwork and safety climate, where the average rating of 3.98 corresponds to "rather agree" (scale range 1-5). Staffing and resources adequacy was rated below "rather agree" with an average rating of 2.82. As for work stressors, the most frequent stressor was workload with a mean rating of 1.53, placing it between "seldom" and "sometimes".

Table 3: *Characteristics of variables under study*

	Valid n	%	Mean	SD	Missing n (%)
Facility characteristics (n=156 facilities)					
Language region					0 (0)
German-speaking part	118	75.6			
French-speaking part	29	18.6			
Italian-speaking part	9	5.8			
Profit status					0 (0)
Public	58	37.2			
Private subsidized[a]	41	26.3			
Private	57	36.5			
Facility size					0 (0)
Small (20-49 beds)	59	37.8			
Medium (50-99 beds)	75	48.1			
Large (100 and more beds)	22	14.1			
Unit characteristics (n=402 units)					
Number of beds	402		25.2	11.1	0 (0)
Number of FTE/100 beds	402		51.8	16.0	0 (0)
Turnover overall (%)	402		12.0	15.8	0 (0)

	Valid n	%	Mean	SD	Missing n (%)
Unit characteristics (cont'd) (n=402 units)					
Residents with either diagnosis or symptoms of dementia (%)	402		62.1	24.4	0 (0)
Nursing home resident characteristics (per unit, n=402 units)					
Mean age (years)	402		84.6	3.1	0 (0)
Mean length of stay (days)	402		1236.0	436.2	0 (0)
Mean care load (scale from 1-12)	402		5.9	1.6	0 (0)
Care worker characteristics (n=4307 respondents)					
Gender (female)	3930	92.3			49 (1.1)
Age (years)	4176		43.37	12.21	131 (3.0)
Educational background					50 (1.2)
Registered nurse (3-4 years of education)	1078	25.3			
Licensed practical nurse (3 years of education)	916	21.5			
Certified assistant nurse (1-2 years of education)	843	19.8			
Nurse aide (training on the job)	1280	30.1			
Other	140	3.3			
Usual shift					224 (5.2)
Regular change of shifts	1406	34.4			
Day/evening shift	2156	52.8			
Night shift	521	12.8			
Work environment (scale range)					
Nurse manager ability, leadership, and support of care workers (1-4)	4306		3.14	0.59	1 (0.0)
Staffing and resources adequacy (1-4)	4299		2.82	0.66	8 (0.2)
Teamwork and safety climate (1-5)	4291		3.98	0.66	16 (0.4)
Work stressors: Conflict and lack of recognition (0-4)	4290		0.90	0.66	17 (0.4)
Work stressors: Workload (0-4)	4289		1.53	0.82	18 (0.4)
Work stressors: Lack of preparation (0-4)	4283		0.68	0.59	24 (0.6)
Implicit rationing of nursing care (scale range: 0-4)					
Activities of daily living	4244		1.36	0.55	63 (1.5)
Caring, rehabilitation, and monitoring	4261		1.70	0.62	46 (1.1)
Documentation	4240		2.03	0.88	67 (1.6)
Social care	4142		1.45	1.10	165 (3.8)

[a] private subsidized nursing homes are nursing homes under private law with a guarantee from some authority (mostly municipal) that either their deficit, part of their operating costs or some investments are covered

5.4.2. Frequency of implicit rationing of nursing care

Across all items at least two thirds of the respondents declared that they rarely or never ration care, with the highest frequency of no rationing in the assistance with drinking and food intake (76.8% resp. 73.8%, cf. Table 1). The activities rationed most often were the studying of care plans and documentation, keeping residents who had rung waiting for more than five minutes, carrying out social care, followed by activating or rehabilitating care, and offering emotional support. Assisting residents with drinking and food intake, leaving a resident more than 30 minutes in his urine or stool, and mobilizing residents were the least

rationed activities. The activities under social care were most often declared as not being required (18.3% - 36.4%).

5.4.3. Factors related to implicit rationing of nursing care

Overall, most work environment factors were found to be significantly related with implicit rationing of nursing care, while staffing level and turnover were of less importance (Table 4). Little difference could be found between unadjusted and adjusted models for work environment factors, while FTE/100 beds changed its statistical significance with the adjusted models in three subscales.

The findings in Table 4 provide little support that staffing level or turnover were related to rationing of care. Fewer FTE/100 beds was only related to higher rationing of documentation in the adjusted model, but according to the beta value, the results was of little clinical significance. Staff turnover was not related to any rationing subscale.

As for work environment factors, higher staffing and resources adequacy, work stress due to workload and due to conflict and lack of recognition were associated with lower rationing in all subscales, while higher teamwork and safety climate and work stress due to lack of preparation were only related to lower rationing in the subscales activities of daily living and caring, rehabilitation, and monitoring. Leadership was not related to any subscale. Interestingly, better teamwork and safety climate was related to higher rather than lower rationing in social care. Stress due to workload and staffing and resources adequacy had the highest impact on rationing documentation (b=0.289 and b=-0.282) with stress due to conflict and lack of recognition impacting most strongly rationing social care (b=0.268). Both rationing of ADL and caring were most strongly impacted by stress due to workload (b=0.130 and b=0.243).

Table 4: *Multiple multilevel regression models for four subscales of rationing of nursing care*

	ADL unadjusted (n=4221)		ADL adjusted[a] (n=3884)		Caring unadjusted (n=4234)		Caring adjusted[a] (n=3893)		Documentation unadjusted (n=4219)		Documentation adjusted[a] (n=3879)		Social care unadjusted (n=4117)		Social care adjusted[a] (n=3795)	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Organizational context																
- *FTE/100 beds*	0.002**	0.001	0.000	0.001	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.004**	0.001	0.005**	0.002	0.000	0.002
- *Turnover*	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.002	0.001	0.002	0.001	0.003	0.002	0.002	0.001
Work environment (PES-NWI)																
- *Leadership*	0.029	0.019	0.029	0.019	0.016	0.019	0.027	0.020	0.050	0.028	0.038	0.029	-0.052	0.041	-0.078	0.041
- *Staffing and resources adequacy*	-0.096***	0.016	-0.104***	0.016	-0.173***	0.016	-0.158***	0.016	-0.294***	0.023	-0.282***	0.024	-0.138***	0.033	-0.164***	0.033
Teamwork and Safety Climate (SAQ)	-0.054**	0.017	-0.059**	0.017	-0.063***	0.017	-0.065***	0.017	-0.042	0.025	-0.033	0.026	0.093*	0.036	0.085*	0.036
Work stressors (HPSI adapted)																
- *Conflict and lack of recognition*	0.088***	0.016	0.084***	0.016	0.117***	0.016	0.121***	0.017	0.225***	0.024	0.219***	0.024	0.278***	0.034	0.268***	0.034
- *Workload*	0.137***	0.013	0.130***	0.013	0.236***	0.013	0.243***	0.013	0.304***	0.019	0.289***	0.019	0.179***	0.027	0.153***	0.027
- *Lack of preparation*	0.069***	0.015	0.068***	0.015	0.065***	0.015	0.059***	0.015	-0.034	0.022	-0.012	0.022	0.014	0.031	-0.008	0.031
Constant	1.294***	0.082	1.569***	0.318	1.886***	0.084	1.195**	0.372	2.257***	0.122	2.472***	0.525	0.782***	0.178	2.174**	0.656
Random-effects Parameters																
- *Facility level variance*	0.004	0.002	0.002	0.002	0.011	0.003	0.007	0.002	0.012	0.005	0.006	0.004	0.007	0.010	0.005	0.007
- *Unit level variance*	0.015	0.003	0.004	0.003	0.014	0.003	0.010	0.003	0.025	0.007	0.026	0.007	0.117	0.019	0.028	0.012
- *Residual variance*	0.223	0.005	0.215	0.005	0.220	0.005	0.216	0.005	0.493	0.011	0.466	0.011	0.952	0.022	0.898	0.022
AIC	5912.8		5208.1		5928.3		5359.1		9240.1		8309.5		11845.3		10542.8	

Notes: Regression coefficients are from a multiple multilevel linear regression model with facility and unit membership as random factors.
PES-NWI=Practice environment scale, nursing work index; SAQ=Safety Attitudes Questionnaire; HPSI=Health Professions Stress Inventory; FTE=Full-time equivalent, AIC=Akaike's information criterion
***p<0.001   **p<0.01   *p<0.05
[a] the adjusted model was controlled for facility characteristics (language region, profit status, size), unit characteristics (size, percentage of residents with diagnosed dementia or symptoms of dementia), resident characteristics (mean age, mean length of stay, mean care load), and care worker characteristics (gender, age, educational background, usual shift)

5.5. Discussion

Rationing of nursing care was relatively rare in Swiss nursing homes and concerned mostly activities related to documentation and social care, while the residents' safety and basic care needs were addressed. Work environment factors, especially better perception of staffing resources and adequacy and higher stress due to workload were related to higher rationing of nursing care while staffing level and turnover were not.

5.5.1. Frequency of implicit rationing of nursing care

Overall, rationing of nursing care was not reported to occur to a great extent in Swiss nursing homes, which is in line with previous findings from Swiss acute care hospitals [42]. The pattern of activities most often rationed in Swiss nursing homes is similar with findings from hospital studies [7, 10-12]: With time constraint, care workers give higher priority to the support in activities of daily living such as eating, drinking, elimination, and mobilization, rationing first documentation and rehabilitation, followed by monitoring residents and communication with residents and families. Care workers thus try to maintain the immediate safety and physical well-being of the residents when under time constraint, sacrificing the care for social needs of residents and their families. However, rationing of monitoring and communication might not only impact the residents' quality of life, but also lead to safety and quality issues. Monitoring and communication allows the early detection of changes in the residents' general condition, such as early signs of infections, pain or symptoms of depression, which is especially important in cognitively impaired residents. Missing these early clues might lead to higher workload when having to deal with already advanced problems of health and increased care needs of residents.

Implicit rationing of social care was rather high. Nursing homes are often a new and final home for the residents. Accordingly, care workers are asked to not only provide basic care, but to also provide social and cultural activities. Physically dependent or cognitively

impaired long-term care residents depend on care workers to build long-term relationships and focus on the residents' quality of life, which includes caring for their autonomy, dignity, privacy, individuality, comfort, relationships, enjoyment, functional competence, and spiritual well-being [43]. Social aspects of nursing home life seem to be the first to suffer under time constraint.

Implicit rationing of care will always be present, since there will never be enough resources to satisfy all health care needs [44]. The necessity to tailor care to patients' or nursing home residents' needs makes it very difficult to define general rules about what to ration when and where [44]. The problem of implicit rationing of care can therefore neither be solved by aiming at eliminating rationing of care nor by moving the decisions about rationing away from the care workers. However, it is important to support care workers in their decision-making and clarify the view and preferences of the residents themselves or their relatives concerning the pattern of rationing activities.

5.5.2. Staffing level and turnover

A key finding was the fact that the actual staffing levels and turnover on unit level were not related to rationing of nursing care. The relationship between staffing levels and rationing might not be linear, but rather a question of a minimal threshold, under which frequent rationing is unavoidable. Such a minimal level was found by Zhu and colleagues [17], where staffing level was related to rationing when there were fewer than 0.4 nurses per patient in the acute care setting, but not at higher levels. Sixty-four percent of the nursing homes participating in this study resided in Swiss cantons that require a minimal staffing level based on residents' care dependency for a nursing home to be credentialed; accordingly, this lower limit where staffing and rationing shows a relationship might not have been reached in our sample. Interestingly, the perception of staffing adequacy was significantly related to rationing while the actual staffing was not. A post-hoc analysis showed that the perception of staffing adequacy and the staffing level with FTE/100 beds are not significantly associated

with each other. On one hand, the perception might better reflect the more dynamic staffing situations in daily practice, i.e. problems to deal with peak situations due to high rates of admittances and discharge, acute situations, residents with challenging behavior, or a high rate of residents in need of physical support, than the overall unit staffing. On the other hand, teams with higher burden of short- and long-term absences might perceive their staffing less adequate although the overall staffing was sufficient. However, a sensitivity analyses with the actual burden of short- or long-term absences of team members did not change the results presented.

Another factor to consider is the importance of the work environment in combination with staffing aspects. In two studies in the acute care setting, lower staff-to-patient ratios [24] and nursing hours per patient day [20] were significantly related to rationing of care, as long as the work environment was not taken into account. When work environment factors were introduced in the statistical models, staffing aspects lost their significance. A good work environment might thus attenuate the effect of lower staffing levels, and the same might be true for the effect of turnover on rationing of care.

5.5.3. Work environment

An important work environment factor to consider is the quality of teamwork: if a team lacks mutual trust, leadership, team orientation, closed-loop communication and shared mental models about the work to be done, it is more difficult to deal with higher workload with the available staffing resources [45]. Aiken and colleagues [46] observed that lower patient-to-nurse ratios did not improve patient outcomes in hospitals with poor work environment, but had a positive effect in hospitals with good or average work environments. Correspondingly, adding more manpower to a team experiencing a poor work environment might not reduce rationing of nursing care as long as the team's perception and handling of the adequacy of staffing, teamwork and safety climate, or work stressors do not change. In a quasi-experimental study, Kalisch and colleagues showed that an intervention to improve

teamwork could reduce missed nursing care significantly [47], which corroborates the importance of teamwork. In this study, teamwork and safety climate were measured by a single score, since they were closely related based on psychometric analysis. Our finding that a better safety climate was associated with less rationing of care corroborates the finding by Schubert and colleagues [24]. Interestingly, better teamwork and safety climate was related to less rationing in the ADL, caring, and documentation subscale, but more rationing of social care. Based on qualitative studies, care workers ration or neglect psychosocial needs in order to be able to take care of residents' safety and basic care needs [48, 49]. Accordingly, the rationing of social care under time constraints eventually supports the residents' safety, though care workers feel guilty about it [49].

Additional important factors related to rationing of care were different work stressors. Most important was stress due to workload, followed by conflicts at work and lack of recognition. The connection of workload stressors with rationing is quite straightforward: care workers who feel stressed because they have too much work to do will set priorities and leave some work undone or perform it faster or to a lower quality level. Conflict and lack of recognition might not have a direct effect on rationing. However, having conflicts with superiors and other professions and not being asked about one's opinion might be signs of a poor work environment where teamwork, delegation, and focusing on the work at hand are difficult to achieve. Additionally, social support, job control, and hope for improvement are important factors that help to deal with stressful situations [50-53]. Having conflicts at work and low recognition are the very reverse of experiencing social support and job control and might thus impede dealing with stress due to high workload in a meaningful way. Omitting care and rationing might then be the only viable ways to handle the stress.

5.5.4. Strengths and limitations

This study has several strengths. It is the first nationally representative study of implicit rationing of care in the long-term care sector, which allows generalizing the findings

to Swiss nursing homes with 20 beds or more. The large sample size and a response rate of 76% allow for reliable results. Moreover, the study uses data from different sources with staffing data that are not self-reported and included all care workers involved in direct resident care on nursing home units. A potential limitation is that the measure of rationing of nursing care was based on the subjective impression of each care worker about, what comprises a necessary nursing care activity and whether it was provided or not. This might be influenced by organizational and individual values not taken into account in this study. Moreover, not all care workers might have felt free to report the level of rationing of care, either feeling guilty for care not provided, or not wanting to expose themselves or their nursing home to retribution or blame. Accordingly, there might be an over- or underrating of rationing. Moreover, the cross-sectional design of the study does not permit causal relationships to be assumed.

5.6. Conclusion

Though the overall rate of rationing of care was rather low in Swiss nursing homes, it is a factor to be considered when looking at resident safety and quality of care. Hence, it is important to sensitize to implicit rationing of care, discuss it openly within nursing homes and in public, and to support care workers both by providing an adequate work environment improving and developing interventions to help handle the issue in view of the increasing problem of recruiting and retaining qualified personnel in the nursing home sector.

Future challenges in research are a) to explore the view of residents and their relatives about implicit rationing of nursing care, b) to examine the associations between implicit rationing of nursing care and resident outcomes in nursing homes, c) to define what level of rationing has detrimental consequences for the residents and care workers, and d) to conduct intervention studies concerning the effect of improved teamwork, and the reduction or better handling of work stressors to reduce implicit rationing of nursing care. For teaching

institutions it is important to integrate implicit rationing of nursing care in the curriculums of all levels of nursing education to sensitize students to its effect on both residents and personnel and to show ways to handle it. Individual nursing homes or nursing home organizations need to define, what responsibilities care workers with different educational backgrounds have in the decision-making concerning implicit rationing of care, to find ways to reach an agreement within a team what has to be rationed when under what circumstances, to support care workers in their handling and reflection of peak situations and work stressors and to apply working interventions to reduce implicit rationing.

5.7. Acknowledgement

5.8. References

1. Lafortune, G., Balestat, G. and Disability Study Expert Group Members (2007). *Trends in severe disability among elderly people: Assessing the evidence in 12 OECD countries and the future implications. OECD HEALTH WORKING PAPERS NO. 26*. Paris: OECD. Retrieved from http://www.oecd.org/sweden/38343783.pdf

2. Seitz, D., Purandare, N. and Conn, D. (2010). Prevalence of psychiatric disorders among older adults in long-term care homes: A systematic review. *International Psychogeriatrics*, *22*(7), 1025-39.

3. Varcoe, C. and Rodney, P. (2012). Constrained agency: The social structure of nurses' work. In Baylis, F., Hoffmaster, B., Sherwin, S. and Borgerson, K. (Eds.), *Health Care Ethics in Canada* (pp. 97-114). Toronto, ON: Nelson.

4. Schweizerische Akademie der Medizinischen Wissenschaften SAMW (2007). *Rationierung im Schweizer Gesundheitswesen: Einschätzung und Empfehlungen*. Basel: Schweizerische Akademi der Medizinischen Wissenschaften SAMW. Retrieved from http://www.samw.ch/de/Publikationen/Positionspapiere.html

5. Nagel, E., Alber, K. and Bayerl, B. (2010). Rationalisierung, Priorisierung und Rationierung - Konzepte zur Gesundheitsversorgung der Zukunft. *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen*, *104*(5), 355-359.

6. Colombo, F., Llena-Nozal, A., Mercier, J. and Tjadens, F. (2011). *Help wanted? Providing and paying for long-term care. OECD Health Policy Studies*. OECD Publishing.

7. Kalisch, B. J., Landstrom, G. and Williams, R. A. (2009). Missed nursing care: Errors of omission. *Nursing Outlook*, *57*(1), 3-9.

8. Schubert, M., Glass, T. R., Clarke, S. P., Schaffert-Witvliet, B. and De Geest, S. (2007). Validation of the Basel Extent of Rationing of Nursing Care instrument. *Nursing Research*, *56*(6), 416-24.

9. Papastavrou, E., Andreou, P. and Vryonides, S. (2014). The hidden ethical element of nursing care rationing. *Nursing Ethics*, *21*(5), 583-593.

10. Ausserhofer, D., Zander, B., Busse, R., Schubert, M., De Geest, S., Rafferty, A. M., Ball, J., Scott, A., Kinnunen, J., Heinen, M., Sjetne, I. S., Moreno-Casbas, T., Kozka, M., Lindqvist, R., Diomidous, M., Bruyneel, L., Sermeus, W., Aiken, L. H. and Schwendimann, R. (2014). Prevalence, patterns and predictors of nursing care left undone in European hospitals: Results from the multicountry cross-sectional RN4CAST study. *BMJ Quality & Safety*, *23*(2), 126-35.

11. Zander, B., Dobler, L., Baumler, M. and Busse, R. (2014). Implizite Rationierung von Pflegeleistungen in deutschen Akutkrankenhäusern - Ergebnisse der internationalen Pflegestudie RN4Cast. *Gesundheitswesen*, *76*(11), 727-34.

12. Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J. A., Busse, R., Clarke, H., Giovannetti, P., Hunt, J., Rafferty, A. M. and Shamian, J. (2001). Nurses' reports on hospital care in five countries. *Health Affairs*, *20*(3), 43-53.

13. Künzi, K. and Schär Moser, M. (2002). *Die Arbeitssituation im Pflegebereich im Kanton Bern*. Bern: Gesundheits- und Fürsorgedirektion des Kantons Bern.

14. Morin, D. and Leblanc, N. (2005). Less money, less care: How nurses in long-term care allocate hours of needed care in a context of chronic shortage. *International Journal of Nursing Practice*, *11*(5), 214-20.

15. Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E. and Griffiths, P. (2014). 'Care left undone' during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality & Safety*, *23*(2), 116-25.

16. Friese, C. R., Kalisch, B. J. and Lee, K. H. (2013). Patterns and correlates of missed nursing care in inpatient oncology units. *Cancer Nursing*, *36*(6), E51-7.

17. Zhu, X. W., You, L. M., Zheng, J., Liu, K., Fang, J. B., Hou, S. X., Lu, M. M., Lv, A. L., Ma, W. G., Wang, H. H., Wu, Z. J. and Zhang, L. F. (2012). Nurse staffing levels make a difference on patient outcomes: A multisite study in Chinese hospitals. *Journal of Nursing Scholarship*, *44*(3), 266-73.

18. Kalisch, B. J., Gosselin, K. and Choi, S. H. (2012). A comparison of patient care units with high versus low levels of missed nursing care. *Health Care Management Review*, *37*(4), 320-8.

19. Kalisch, B. J., Tschannen, D. and Lee, K. H. (2011). Do staffing levels predict missed nursing care? *International Journal for Quality in Health Care*, *23*(3), 302-8.

20. Kalisch, B. J. and Lee, K. H. (2012). Missed nursing care: Magnet versus non-Magnet hospitals. *Nursing Outlook*, *60*(5), e32-e39.

21. Kalisch, B. J. and Lee, K. H. (2010). The impact of teamwork on missed nursing care. *Nursing Outlook*, *58*(5), 233-41.

22. Papastavrou, E., Andreou, P., Tsangari, H., Schubert, M. and De Geest, S. (2013). Rationing of nursing care within professional environmental constraints: A correlational study. *Clinical Nursing Research*, *23*(3), 314-35.

23. Rochefort, C. M. and Clarke, S. P. (2010). Nurses' work environments, care rationing, job outcomes, and quality of care on neonatal units. *Journal of Advanced Nursing*, *66*(10), 2213-24.

24. Schubert, M., Ausserhofer, D., Desmedt, M., Schwendimann, R., Lesaffre, E., Li, B. and De Geest, S. (2013). Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals — a cross sectional study. *International Journal of Nursing Studies*, *50*(2), 230-239.

25. Simmons, S. F., Durkin, D. W., Rahman, A. N., Choi, L., Beuscher, L. and Schnelle, J. F. (2013). Resident characteristics related to the lack of morning care provision in long-term care. *Gerontologist*, *53*(1), 151-61.

26. Willumsen, T., Karlsen, L., Naess, R. and Bjorntvedt, S. (2012). Are the barriers to good oral hygiene in nursing homes within the nurses or the patients? *Gerodontology*, *29*(2), e748-55.

27. Bundesamt für Statistik. (2014). *Statistik der sozialmedizinischen Institutionen 2012 – Standardtabellen*. Neuchâtel: Bundesamt für Statistik.

28. Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R., *Schlussbericht zur Befragung des Pflege- und Betreuungspersonals in Alters- und Pflegeinstitutionen der Schweiz*, Basel, U., Editor. 2013.

29. Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and de Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

30. Maneesriwongul, W. and Dixon, J. K. (2004). Instrument translation process: A methods review. *Journal of Advanced Nursing*, *48*(2), 175-86.

31. Polit, D. F., Beck, C. T. and Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, *30*(4), 459-67.

32. Zimmermann-Sloutskis, D., Moreau-Gruet, F. and Zimmermann, E. (2012). *Comparaison de la qualité de vie des personnes âgées vivant à domicile ou en institution (Obsan Rapport 54)*. Neuchâtel: Schweizerisches Gesundheitsobservatorium.

33. Robichaud, L., Durand, P. J., Bedard, R. and Ouellet, J. P. (2006). Quality of life indicators in long-term care: Opinions of elderly residents and their families. *Canadian Journal of Occupational Therapy*, *73*(4), 245-51.

34. Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health*, *25*(3), 176-88.

35. Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R. and Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, *6*, 44.

36. Wolfgang, A. P. (1988). The Health Professions Stress Inventory. *Psychological Reports*, *62*(1), 220-2.

37. Akhtar, S. and Lee, J. S. (2002). Confirmatory factor analysis and job burnout correlates of the Health Professions Stress Inventory. *Psychological Reports*, *90*(1), 243-50.

38. Castro, S. L. (2002). Data analytic methods for the analysis of multilevel questions: A comparison of intraclass correlation coefficients, rwg(j), hierarchical linear modeling, within- and between-analysis, and random group resampling. *The Leadership Quarterly*, *13*(1), 69-93.

39. Biemann, T., Cole, M. S. and Voelpel, S. (2012). Within-group agreement: On the use (and misuse) of rWG and rWG(J) in leadership research and some best practice guidelines. *The Leadership Quarterly*, *23*(1), 66-80.

40. LeBreton, J. M. and Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods*, *11*(4), 815-852.

41. Field, A. (2009). *Discovering statistics using SPSS*. London: Sage.

42. Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M. and De Geest, S. (2008). Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, *20*(4), 227-37.

43. Kane, R. A. (2003). Definition, measurement, and correlates of quality of life in nursing homes: Toward a reasonable practice, research, and policy agenda. *The Gerontologist*, *43*(suppl 2), 28-36.

44. Tragakes, E. and Vienonen, M. (1998). *Key issues in rationing and priority setting for health care services*. WHO Regional Office for Europe.

45. Kalisch, B. J. (2009). Nurse and nurse assistant perceptions of missed nursing care: What does it tell us about teamwork? *Journal of Nursing Administration*, *39*(11), 485-93.

46. Aiken, L. H., Cimiotti, J. P., Sloane, D. M., Smith, H. L., Flynn, L. and Neff, D. F. (2011). Effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Medical Care*, *49*(12), 1047-53.

47. Kalisch, B. J., Xie, B. and Ronis, D. L. (2013). Train-the-trainer intervention to increase nursing teamwork and decrease missed nursing care in acute care patient units. *Nursing Research*, *62*(6), 405-13.

48. Nortvedt, P., Pedersen, R., Grothe, K. H., Nordhaug, M., Kirkevold, M., Slettebø, Å., Brinchmann, B. S. and Andersen, B. (2008). Clinical prioritisations of healthcare for the aged - professional roles. *Journal of Medical Ethics*, *34*(5), 332-5.

49. Slettebø, Å., Kirkevold, M., Andersen, B., Pedersen, R., Halvorsen, K., Nordhaug, M. and Nortvedt, P. (2010). Clinical prioritizations and contextual constraints in nursing homes – a qualitative study. *Scandinavian Journal of Caring Sciences*, *24*(3), 533-540.

50. Schmidt, K.-H. and Diestel, S. (2011). Differential effects of decision latitude and control on the job demands-strain relationship: A cross-sectional survey study among elderly care nursing staff. *International Journal of Nursing Studies*, *48*(3), 307-317.

51. Woodhead, E. L., Northrop, L. and Edelstein, B. (2014). Stress, social support, and burnout among long-term care nursing staff. *Journal of Applied Gerontology*.

52.   Liang, Y.-W., Hsieh, Y., Lin, Y.-H. and Chen, W.-Y. (2014). The impact of job stressors on health-related quality of life of nursing assistants in long-term care settings. *Geriatric Nursing, 35*(2), 114-119.

53.   Sapolsky, R. M. (2004). *Why zebras don' get ulcers. The acclaimed guide to stress, stress-related diseases, and coping.* New York: St. Martin's Griffin.

CHAPTER 6

ARE STAFFING, WORK ENVIRONMENT, WORK STRESSORS, AND RATIONING OF CARE RELATED TO CARE WORKERS' PERCEPTION OF QUALITY OF CARE? A CROSS-SECTIONAL STUDY

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6.1. Abstract

Objectives. To describe care worker-reported quality of care and to examine its relationship with staffing variables, work environment, work stressors, and implicit rationing of nursing care.

Design. Cross-sectional study.

Setting. National, randomly selected sample of Swiss nursing homes, stratified according to language region and size.

Participants. 4311 care workers of all educational backgrounds (registered nurses, licensed practical nurses, nurse aides) from 402 units in 155 nursing homes completed a survey between May 2012 and April 2013.

Measurements. Care worker-reported quality of care was measured with a single item; predictors were assessed with established instruments (e.g. Practice Environment Scale – Nursing Work Index) adapted for nursing home use. A multilevel logistic regression model was applied to assess predictors for quality of care.

Results. Overall, 7% of care workers rated the quality of care provided as rather low or very low. Important factors related to better quality of care were higher teamwork and safety climate (OR=6.19; 95% CI, 4.36-8.79), better staffing and resources adequacy (OR=2.94; 95% CI, 2.08-4.15), less stress due to workload (OR=0.71; 95% CI, 0.55-0.93), less implicit rationing of caring, rehabilitation, and monitoring (OR=0.34; 95% CI, 0.24-0.49), and less rationing of social care (OR=0.80; 95% CI, 0.69-0.92). Neither leadership nor staffing levels, staff mix, or turnover were significantly related to quality of care.

Conclusions. Work environment factors and organizational processes are vital to provide high quality of care. The improvement of work environment, support in handling work stressors and reduction of rationing of nursing care might be intervention points to promote high quality of care in nursing homes.

6.2.   Introduction

Nursing homes play an important role in the provision of care for dependent older people. Compared to former decades, older adults in nursing homes demand more choice, service quality, and autonomy, while needing more intensive care and resources. Due to the demographic change with a higher number of care-dependent older people and the need for expansion and diversity in service, nursing homes are challenged to provide continuous high levels of quality of care, while at the same time having difficulties in recruiting and retaining a qualified nurse workforce [1, 2]. Long-term care expenditure will substantially increase by 2050, increasing the demand for accountability about public spending in this sector [3]. Accordingly, the quality of care in nursing homes has become an international priority [2].

The Institute of Medicine defines quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" [4]. An aspect seldom explored in nursing home research is the care workers' perception of quality of care. Care workers are the residents' primary care providers as well as intermediaries with other services and they are in an excellent position to rate the quality of care provided. Their perception of quality of care is not based on isolated contacts or adverse events, such as pressure ulcers or patient falls, but has developed over time in a variety of encounters with residents and in interdisciplinary collaboration [5]. Hospital studies showed that nurse-reported quality of care was e.g. related to mortality, failure to rescue, survival, and patients' reports of their care experience [5-7], and was a valid indicator that reflected differences in hospital quality [5].

Based on the structure-process-outcome-model of Donabedian [8], Figure 1 shows that quality of care, considered as an outcome is determined by structure and process factors, such as organizational, personnel, and resident characteristics, as well as the work environment, work stressors, and the necessity of rationing of care. The relationships of staffing level, turnover, or staff mix with quality of care have been broadly researched in nursing homes [9-

11] with a tendency for better quality of care being associated with better staffing factors, but results are still inconclusive. Studies seldom combine staffing with work environment factors like leadership behavior, care workers' participation in decision making, communication, collaboration, conflict resolution, or teamwork, which have been repeatedly shown to be positively related to quality of care in nursing homes and might influence the relationship of staffing with quality of care [12-21]. Higher safety climate is related to better quality outcomes in the hospital sector [22, 23], but evidence is still scarce about its importance in nursing homes [24]. Work stressors, especially high workloads with time pressure, role ambiguity, role conflict, and lack of skills tend to be negatively associated with quality of care with some mixed results [25-29]. An additional element that might be related to quality of care and has not been examined so far in nursing homes is implicit rationing of nursing care. It reflects the process of nursing care, i.e. what is actually done when giving care and what is left undone due to time constraints and might help to explain the variation observed in the relationship of staffing resources, work environment, and work stressors with quality of care. Hospital studies showed significant relationships of rationing of nursing care with patient satisfaction, overall quality of care, falls, pressure ulcers, medication errors, and mortality rates [30-38].

A recent review showed that there is still a lack of international studies looking at the relationship of nursing homes' work environment with quality of care and that most studies to date were US- or Canada-based [39]. Moreover, implicit rationing of nursing care has not yet been integrated in nursing home research about quality of care. The aims of the study were therefore (1) to describe care- worker reported quality of care and (2) to examine its relationship with staffing, work environment characteristics, work stressors, and implicit rationing of nursing care.
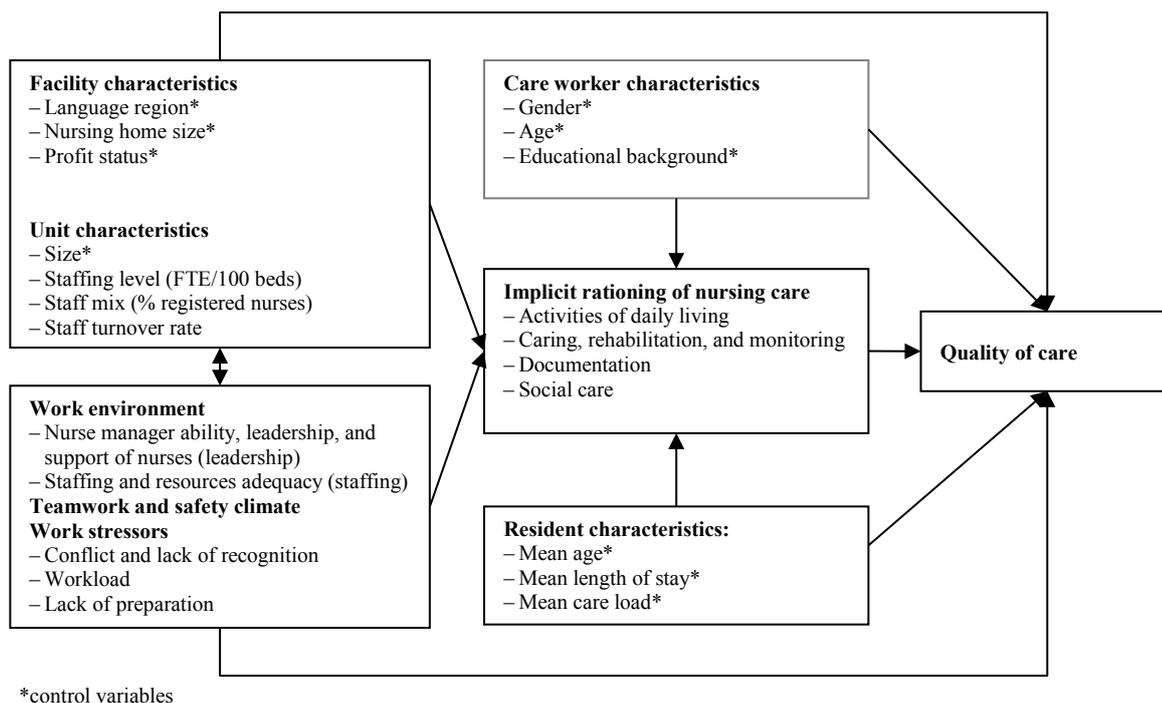
Figure 1: *Factors related to quality of care*

6.3. Methods

6.3.1. Design and sample

This study was nested within the Swiss Nursing Home Human Resources Project (SHURP), a cross-sectional, multi-center study in a random sample of 163 nursing homes in the German-, French-, and Italian-speaking language regions of Switzerland. The sampling, data collection and data management are described elsewhere in more detail [40]. Included were nursing homes licensed by Swiss cantonal authorities with at least 20 beds; residential homes and hospice facilities were excluded. In this sub-sample, units that did not provide unit data were excluded. All care workers within a nursing home were included if they had no leadership position and had worked at least 8 hours per week for at least one month on their assigned unit.

6.3.2. Variables and measurement

To measure *quality of care*, care workers were asked to rate the overall quality of care on their unit in a single item on a 4-point Likert scale, which for analysis was dichotomized as very low or rather low opposed to rather high or very high in accordance with former studies [6, 41, 42]. A single-item measure of nurse-reported quality of care has been repeatedly used in hospital studies [6, 34, 43, 44] and has been shown to be a valid measurement of quality of care on the hospital level [5]. In this study, intraclass correlation (ICC) 2 was 0.69 on unit level and 0.80 on facility level. The independent variables of interest as described in Figure 1 are staffing levels, staff mix, and turnover at the unit level, and perceptions of work environment factors, teamwork and safety climate, work stressors, and implicit rationing of nursing care at the individual level. The variables are described in Table 1.

Table 1: *Description of independent variables used in study*

Variable Name	Description	Measurement
Unit characteristics		
Number of beds	Number of beds on unit	
Number of FTE/100 beds	Number of full-time equivalent (FTE) positions divided by number of beds multiplied by 100	
Staff mix (%)	Percentage of registered nurses of all FTE per unit	
Turnover overall (%)	Number of persons who left the unit in the last 6 months in relation to the number of persons present at the time of data collection	
Residents with either diagnosis or symptoms of dementia (%)	Percentage of residents on unit who have either a diagnosed dementia of any form or who have symptoms of dementia (e.g. memory problems, difficulties with language, planning and executing daily activities, change in personality and mood, social withdrawal)	
Residents		
Mean age	Mean age of all residents per unit	Years
Mean length of stay	Mean length of stay of all residents on unit, calculated from day of admission to day of data collection	Days
Mean care load (scale from 1-12)	Mean care load of all residents on unit: based on national reimbursement system, each resident is allocated to one of 12 groups. Each higher group represents an additional 20 minutes in care time per day.	Group 1 to 12
Practice Environment Scale- Nursing Work Index (PES-NWI)		
Leadership	5-item subscale "*Nurse manager ability, leadership, and support of care workers*" of the PES-NWI [45], assessing support by direct supervisors, their competency, back-up in decision making, praise and recognition given, and the use of mistakes as learning opportunities and not criticism	4-point Likert scale from 1=strongly disagree to 4=strongly agree Cronbach's α=.84

Variable Name	Description	Measurement
Practice Environment Scale- Nursing Work Index (PES-NWI) (cont'd)		
Staffing and resources adequacy	3-item subscale "*Staffing and resources adequacy*" of the PES-NWI [45], assessing whether there was enough time and opportunity to discuss resident care problems, enough qualified personnel to provide quality resident care, and enough staff to get the work done	4-point Likert scale from 1=strongly disagree to 4=strongly agree Cronbach's α=.74
Safety Attitude Questionnaire (SAQ)		
Teamwork and safety climate	Combination of two subscales of the SAQ [46]: Based on confirmatory factor analysis, the original two subscales *Teamwork* and *Safety Climate* could not be confirmed. Three items with low item discrimination (corrected item-scale correlation < 0.4) were removed. This resulted in one 10-item single factor for *Teamwork and Safety Climate,* assessing e.g. the opportunity to speak up or to ask questions when something is not understood, the extent to which other team members provide assistance when needed, the opportunity to discuss errors and to learn from each other, and the reception of feedback about one's performance	5-point Likert scale from 1=strongly disagree to 5=strongly agree with the option "don't know" Cronbach's α=.89
Health Professions Stress Inventory (HPSI)		
	Out of the original 30-item HPSI [47, 48] 12 items were selected based on expert ratings concerning their relevance in the nursing home context. Exploratory factor analysis identified 3 factors. Rating of frequency of experiencing stress.	5-point Likert scale ranging from 0=never to 4=very often
Work stressors: Conflict and lack of recognition	6-item subscale, assessing e.g. disagreement with other health professionals concerning residents' treatment, conflicts with supervisors, not being asked about one's opinion when making decisions about one's job, and not being paid enough	Cronbach's α=.76
Work stressors: Workload	3-item subscale, assessing e.g. having so much work to do that not everything can be done well and not having enough people working to get the work done well	Cronbach's α=.74
Work stressors: Lack of preparation	3-item subscale, assessing e.g. not being trained to meet residents' needs, being afraid of making a mistake in the residents' treatment and being overwhelmed by caring for terminally ill residents	Cronbach's α=.63
Basel Extent of Rationing of Nursing Care (BERNCA)		
	Original version adapted to nursing homes [49]. Additional three questions concerning the rationing of social activities. Rating of how often in the last seven days care workers could not perform certain care activities that were necessary and usual, due to lack of time or high workload.	5-point Likert scale from "1=never" to "4=often" with a "0" option for activity that was no necessary
Activities of daily living	5-item subscale, assessing e.g. support with eating, drinking, washing, mouth care	Cronbach's α=.78
Caring, rehabilitation, and monitoring	8-item subscale assessing e.g. emotional support of residents or relatives, toileting, rehabilitating care, monitoring confused residents	Cronbach's α=.83
Documentation	3-item subscale, assessing e.g. setting up care plans, documentation of care	Cronbach's α=.77
Social care	3-item subscale, assessing e.g. single or group activities with residents	Cronbach's α=.86

6.3.3. Data collection

The survey was administered in the three language versions German, French, and

Italian between May 2012 and April 2013. All nursing home directors from the participating

nursing homes gave written informed consent to participate in the study. Sending back the care worker questionnaire was considered informed consent from care workers. The study was approved by all Swiss cantonal ethics committees (leading ethics committee: Beider Basel, Ref.Nr. EK:02/12).

6.3.4. Data analysis

Descriptive statistics (frequencies, percentages, means, standard deviations (SD)) were calculated as appropriate to describe the variables measured. A three-level logistic regression model was used to examine the relationship of staffing, work environment, and rationing of nursing care with quality of care. The decision for multilevel analysis was based on the calculation of intraclass correlation 1 (ICC1) and the between-group variance among units and facilities: ICC1 was 0.17 on unit level and 0.11 on the facility level for quality of care and both units and facilities differed significantly in relation to quality of care, which made it necessary to account for the clustering of care worker data within units and facilities. Both unadjusted and adjusted results are reported. To compare relative fits of the models, Akaike's information criterion (AIC) was used; the model with the lower value has a better fit [50]. Cases with missing values were excluded from the analysis. A p-level of <.05 was considered significant. Since care workers might overrate the quality of care, a sensitivity analysis was performed excluding the top 10% of performing units in relation to reported quality of care. Data analyses were performed with Stata/IC 13.1.

6.4. Results

The final sample consisted of 4,311 care workers from 402 units and 77 additional care teams not assigned to a specific unit (e.g. night shift team) in 155 nursing home facilities. The mean response rate over all units was 79.3%. Most respondents came from medium-sized facilities in the German-speaking region. The average unit size was 25 beds with 13 FTE care worker positions of which 32% were registered nurses. The average turnover per unit was

12% and 62% of residents had either a diagnosis or symptoms of dementia. Facility, unit, resident, and personnel characteristics are detailed in Table 2. Seven percent (n=289) of the care workers reported rather low or very low quality of care on their units, one third of which were concentrated in 13 facilities where 20% and more of care workers reported that their organization had a low quality of care. Overall, care workers gave high mean ratings for leadership and teamwork and safety climate, while staffing and resources adequacy was less favorably rated. The most frequent source of work stress was heavy workload with a mean rating of 1.53, which corresponds to answers between the options seldom and sometimes.

Table 2: *Characteristics of variables under study*

	%	Mean	SD	Missing n (%)
Facility characteristics (n=155 facilities)				
Language region				0 (0)
German-speaking part	75.5			
French-speaking part	18.7			
Italian-speaking part	5.8			
Profit status				0 (0)
Public	37.4			
Private subsidized	26.5			
Private	36.1			
Facility size				0 (0)
Small (20-49 beds)	38.1			
Medium (50-99 beds)	47.7			
Large (100 and more beds)	14.2			
Unit characteristics (n=402 units)				
Number of beds		25.2	10.7	0 (0)
Number of FTE/100 beds		51.7	15.3	0 (0)
Staff mix (% registered nurses)		31.8	11.9	0(0)
Turnover overall (%)		11.8	15.6	0 (0)
Residents with either diagnosis or symptoms of dementia (%)		62.1	24.4	0 (0)
Nursing home resident characteristics (per unit, n=402 units)				
Mean age (years)		84.6	3.0	0 (0)
Mean length of stay (days)		1237.0	434.5	0 (0)
Mean care load (scale from 1-12)		5.9	1.6	0 (0)
Care worker characteristics (n=4311 respondents)				
Gender (female)	92.3			50 (1.2)
Age (years)		43.37	12.20	132 (3.1)
Care worker characteristics (n=4311 respondents) (cont'd)				
Educational background				50 (1.2)
Registered nurse (3-4 years of education)	25.3			
Licensed practical nurse (3 years of education)	21.5			
Certified assistant nurse (1-2 years of education)	19.9			
Nurse aide (training on the job)	30.0			
Other	3.3			

	%	Mean	SD	Missing n (%)
Work environment (scale range)				
PES-NWI: Leadership (1-4)		3.14	0.59	1 (0.0)
PES-NWI: Staffing and resources adequacy (1-4)		2.82	0.66	8 (0.2)
SAQ: Teamwork and safety climate (1-5)		3.97	0.66	16 (0.4)
HPSI Work stressors: Conflict and lack of recognition (0-4)		0.91	0.66	17 (0.4)
HPSI Work stressors: Workload (0-4)		1.53	0.82	18 (0.4)
HPSI Work stressors: Lack of preparation (0-4)		0.68	0.59	24 (0.6)
Implicit rationing of nursing care (BERNCA-NH) (scale range: 0-4)				
Activities of daily living		1.36	0.55	63 (1.5)
Caring, rehabilitation, and monitoring		1.70	0.62	46 (1.1)
Documentation		2.03	0.88	67 (1.6)
Social care		1.45	1.10	166 (3.9)
Care worker –reported quality of care				25 (0.6)
Very low / rather low	6.7			
Very high / rather high	93.3			

FTE: full-time equivalent; PES-NWI: Practice Environment Scale-Nursing Work Index; SAQ: Safety Attitudes Questionnaire; HPSI: Health Professions Stress Inventory; BERNCA-NH: Basel Extent of Rationing of Implicit Rationing of Nursing Care – Nursing Home version.
Underlined scores are preferable scores.

Work environment factors, work stressors, and rationing of nursing care were significantly related to quality of care, while staffing level, staff mix, and turnover were not (Table 3). The factor most strongly associated with quality of care was teamwork and safety climate. The odds of a positive rating of quality of care increased more than six-fold with a one-point increase in the rating of teamwork and safety climate (OR=6.19; 95% CI, 4.36-8.79) and almost three-fold with a better perception of staffing and resources adequacy (OR=2.94; 95% CI, 2.08-4.15). Leadership was not a significant work environment factor related to quality of care in the model. As for work stressors, the odds of a high quality of care decreased with more frequent stress due to workload (OR=0.71; 95% CI, 0.55-0.93), but interestingly increased with stress due to a lack of preparation (OR=1.60; 95% CI, 1.18-2.15). A similar effect was observed among the subscales on rationing of nursing care: while the odds for better quality of care increased with less rationing of caring, rehabilitation, and monitoring (OR=0.34; 95% CI, 0.24-0.49) and less rationing of social care (OR=0.80; 95% CI, 0.69-0.92), with more rationing of documentation increased the odds for better quality of

care (OR=1.45; 95% CI, 1.14-1.84). The sensitivity analysis without the 10% of top rated

units showed similar results.

Table 3: *Relationship of staffing variables, work environment, work stressors, and implicit rationing of nursing care with care worker-perceived quality of care*

	Unadjusted (n=4089)			Adjusted[*] (n=3952)		
	Odds ratio	**95%CI**	**p-value**	**Odds ratio**	**95%CI**	**p-value**
Organizational context						
- *FTE/100 beds*	1.000	0.986 - 1.014	0.999	1.008	0.991 - 1.026	0.364
- *Staff mix*	0.999	0.982 - 1.016	0.899	1.005	0.990 - 1.021	0.496
- *Turnover*	0.989	0.978 - 1.001	0.071	0.992	0.980 - 1.003	0.149
Work environment (PES-NWI)						
- *Leadership*	0.938	0.660 - 1.332	0.719	1.073	0.748 - 1.539	0.702
- *Staffing and resources adequacy*	**2.703**	**1.937 - 3.773**	**0.000**	**2.939**	**2.082 - 4.149**	**0.000**
Teamwork and Safety Climate (SAQ)	**6.454**	**4.558 - 9.139**	**0.000**	**6.186**	**4.355 - 8.788**	**0.000**
Work stressors (HPSI adapted)						
- *Conflict and lack of recognition*	0.794	0.589 - 1.071	0.131	0.785	0.578 - 1.065	0.120
- *Workload*	**0.668**	**0.516 - 0.864**	**0.002**	**0.714**	**0.548 - 0.932**	**0.013**
- *Lack of preparation*	**1.725**	**1.292 - 2.302**	**0.000**	**1.595**	**1.184 - 2.149**	**0.002**
Rationing of nursing care						
- - *Activities of daily living*	0.769	0.560 - 1.057	0.105	0.751	0.541 - 1.043	0.087
- - *Caring, rehabilitation, and monitoring*	**0.380**	**0.267 - 0.541**	**0.000**	**0.340**	**0.236 - 0.490**	**0.000**
- - *Documentation*	**1.313**	**1.044 - 1.651**	**0.020**	**1.447**	**1.140 - 1.836**	**0.002**
- - *Social care*	**0.813**	**0.706 - 0.936**	**0.004**	**0.799**	**0.691 - 0.924**	**0.003**
Constant	**0.049**	**0.008 - 0.287**	**0.001**	**0.000**	**0.000 - 0.147**	**0.010**
Random-effects Parameters						
- *Facility level variance*	0.407	0.172 - 0.966		0.100	0.012 - 0.835	
- *Unit level variance*	0.054	0.000 - 172.254		0.000	- -	
AIC	1142.431			1081.084		

Notes: CI: Confidence interval; FTE: Full-time equivalent; PES-NWI: Practice Environment Scale – Nursing Work Index; SAQ: Safety Attitude Questionnaire; HPSI: Health Professions Stress Inventory; AIC: Akaike's information criterion.

[*] The adjusted model was controlled for: Facility characteristics: language region (German, French, or Italian), profit status (public, private subsidized, private), size (small=20-49 beds, medium=50-99 beds, large=100 and more beds); Unit characteristics: number of beds, percentage of residents with diagnosed dementia or symptoms of dementia; Resident characteristics: mean age per unit, mean length of stay per unit, mean care load; Care worker characteristics: gender, age, educational background

6.5. Discussion

In this study, a high percentage of nursing home care workers perceived a good quality of care on their units. Work environment, work stressors, and implicit rationing of nursing care were important factors related to quality of care, as suggested in Figure 1, while staffing level, staff mix, turnover, and leadership were not. Overall, the findings in this study partly confirm the model described in Figure 1 with facility and unit characteristics showing less importance than expected for unit level quality of care.

The percentage of care workers giving a good quality of care rating was very high with 93%. In comparison, 80% of care workers in Germany rated the quality of care in nursing homes to be good [41], while in a large hospital study over 12 countries, the percentage of nurses considering the quality of care on their ward as good ranged from 53% in Greece, 65% in Germany, 80% in Switzerland, and 84% in the USA to the highest percentage of 89% in Ireland [6].

In our study, teamwork and safety climate was the most important factor related to good quality of care. This is consistent with US nursing homes care workers where teamwork was the most influential factor in the ability to provide good care, followed by good communication and working with experienced and dedicated colleagues [51]. Good teamwork in health care teams is reached through interdependent collaboration, open communication, and shared decision-making [52]. Care workers themselves identify local interaction patterns such as being approachable, pitching-in, seeking assistance, giving praise or respect as fundamental activities that improve teamwork and quality of care [53]. Interventions to improve these local interaction patterns show potential to improve resident outcomes, such as e.g. falls [54]. Teamwork allows for a smoother work organization, streamlines workflow, and gives more time to offer residents individualized care [55].

Both high stress due to workload and care workers' perception of inadequate staffing resources were related to a decreased quality of care, as opposed to actual staffing levels, which showed no relationship with quality of care. Based on qualitative research, the mechanism in play might be that lack of time leads to rationing of relational aspects of care, while physical care in the activities of daily living are maintained [56]. Other studies confirm this link between the lack of adequate time and perceived staffing and the ability to form meaningful relationship with residents [57] and to provide individualized care [51, 58]. Based on interviews in hospitals, nurses included in their rating of staffing adequacy the personnel mix, the cohesiveness of the staff, the care delivery systems, and how well nurses knew the patients [59], which covers more than just actual staffing numbers. The lack of a relationship between staffing levels and quality of care in this study might point to the importance of not only the numbers of care workers but the quality of the team: Care workers who are able to collaborate as a team, have a shared concept about care, a clear task distribution, and an open communication, might better handle a higher workload than a less-well functioning team.

Surprisingly, leadership was not related to quality of care. It suggests that teamwork may be more important than leadership for the perception of quality of care. In a UK-hospital study, managerial support after clinical incidents was not related to perceived quality of care delivery, while the lack of support from colleagues worsened the perception of quality of care [60]. Peers are of paramount importance to handle challenging clinical demands or complex care situations. However, according to a US nursing home study, the combined presence of different working conditions such as good leadership, communication, teamwork, and staff appreciation were shown to be related with better quality of care [61]. Leaders provide the structures and processes needed to allow for good teamwork, communication, and safety climate and to reduce work stressors [53, 61]; they deal with staff shortages and create supportive conditions to ensure continuity of care [62]. Further studies are needed to explore this lack of a relationship of leadership ratings with quality of care in this study.

While the rationing of activities of daily living was not related to quality of care, both the rationing of caring and social care were associated with lower perceptions of quality of care. Care workers in nursing home conceptualize quality of care as creating a home-like environment, where holistic, emotional, individualized, and family-centered care is possible [56]. According to Bowers et al. [55], short staffed situations led not only to care activities left undone, but also to a bundling of activities, which reduce to possibility of individualize care and building a relationship with residents and causes distress for both care workers and residents. Both rationing of caring and of social care refer to the reduction of the relational aspect of nursing care and make it difficult to provide individualized and person-centered care. In contrast, the rationing of documentation is related to a better perception of quality of care, probably because less time spent with administrative tasks allowing more time to be spent with residents. The development of personal care worker-resident relationships and person-centered care has been repeatedly linked with high quality of care [63], as well as residents' well-being [64, 65] and care workers' job satisfaction and retention [57, 66, 67].

An unexpected finding was the positive relationship between care workers reporting more frequent stress due to lack of preparation for their job and better ratings of quality of care. A possible explanation might be that the awareness of one's own short-comings heightens the desire and effort to provide good care. On the other hand, the inadequate preparation might negatively impact care workers' ability to recognize deficits in the care quality on their unit. Overall, this finding needs further inquiry to be able to understand it.

A strength of this study is the use of administrative data for staffing and that all data were collected in the same time frame, allowing an actual comparison of staffing, work environment, work stressors, rationing, and outcome data. However, since the results of this study are cross-sectional, no causal links can be established. Longitudinal studies with actual changes in work environment factors, work stressors or implicit rationing of nursing care would be valuable to confirm the findings. The random selection of the nursing homes allows

for a generalization of the results for Switzerland. However, the specific context of Swiss nursing homes with e.g. a high proportion of registered nurses in care teams (mean of 31%) requires caution for further generalization [68]. A potential limitation of the study is the subjective rating of quality of care. Although care workers are in a very good position to rate quality of care, we do not explicitly know how they define quality of care and they might have different perceptions. Since less well prepared personnel might rate quality of care higher due to an inability to recognize deficits, we controlled for the educational background in our model and did not find a significant difference in the ratings of nurse aides and registered nurses. The results of this study that show the importance of work environment factors for quality of care need further corroboration with additional outcome measures, such as e.g., specific measurements of person-centered care or residents' quality of life. Common-method bias might have influenced the results; however, the use of a different source for staffing data and of different answer options should have helped to reduce the bias.

6.6.   Conclusion

Although nursing home studies comparing care workers' perception of quality of care with other quality measures are lacking, studies in the hospital setting suggest that care workers' perceptions are a valid proxy measure of quality of care. Measuring care workers' perceptions of quality of care might be an important addition to quality measurements. On one hand, awareness of staff perceptions is essential for quality development [14]. On the other hand, care workers' perceptions add to other, more medically oriented quality indicators, since they seem to put emphasis on the relational aspects of care. Further inquiry is needed to examine the relationship of care workers' perceptions of quality of care with separately measured quality indicators in nursing homes, as well as the importance of work environment factors and implicit rationing of nursing care for other resident outcomes.

The findings of this study suggest several domains of interventions that may improve quality of care in nursing homes, first among them improving the teamwork and safety climate, reducing workload, and reducing rationing of caring. Further research would be needed to evaluate the impact of interventions designed to address the factors identified on quality-related outcomes, including not only care workers' perception of quality of care, but also medical and psychosocial resident outcomes.

6.7. Acknowledgments

6.8. Conflict of interest

None.

6.9. References

1. Müller, K. (2014). *Ageing population and health care provision*. Bern: Hans Huber.
2. OECD/European Commission. (2013). *A good life in old age? Monitoring and improving quality in long-term care*. OECD Health Policy Studies, OECD Publishing.
3. Colombo, F., Llena-Nozal, A., Mercier, J. and Tjadens, F. (2011). *Help wanted? Providing and paying for long-term care*. OECD Health Policy Studies, OECD Publishing.
4. Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington D.C.: National Academy Press.
5. McHugh, M. D. and Stimpfel, A. W. (2012). Nurse reported quality of care: A measure of hospital quality. *Research in Nursing & Health*, *35*(6), 566-75.
6. Aiken, L. H., Sermeus, W., Van den Heede, K., Sloane, D. M., Busse, R., McKee, M., Bruyneel, L., Rafferty, A. M., Griffiths, P., Moreno-Casbas, M. T., Tishelman, C., Scott, A., Brzostek, T., Kinnunen, J., Schwendimann, R., Heinen, M., Zikos, D., Sjetne, I. S., Smith, H. L. and Kutney-Lee, A. (2012). Patient safety, satisfaction, and quality of hospital care: Cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ*, *344*, e1717.
7. Tvedt, C., Sjetne, I. S., Helgeland, J. and Bukholm, G. (2014). An observational study: Associations between nurse-reported hospital characteristics and estimated 30-day survival probabilities. *BMJ Quality & Safety*, *23*(9), 757-64.
8. Donabedian, A. (1988). The quality of care: How can it be assessed? *Journal of the American Medical Association*, *260*(12), 1743-1748.
9. Shin, J. H. and Bae, S. H. (2012). Nurse staffing, quality of care, and quality of life in US nursing homes, 1996-2011: An integrative review. *Journal of Gerontological Nursing*, *38*(12), 46-53.
10. Spilsbury, K., Hewitt, C., Stirk, L. and Bowman, C. (2011). The relationship between nurse staffing and quality of care in nursing homes: A systematic review. *International Journal of Nursing Studies*, *48*(6), 732-750.
11. Backhaus, R., Verbeek, H., van Rossum, E., Capezuti, E. and Hamers, J. P. (2014). Nurse staffing impact on quality of care in nursing homes: A systematic review of longitudinal studies. *Journal of the American Medical Directors Association*, *15*(6), 383-393.
12. Anderson, R. A., Issel, L. M. and McDaniel Jr, R. R. (2003). Nursing homes as complex adaptive systems: Relationship between management practice and resident outcomes. *Nurse Researcher*, *52*(1), 12-21.
13. Forbes-Thompson, S., Leiker, T. and Bleich, M. R. (2007). High-performing and low-performing nursing homes: A view from complexity science. *Health Care Management Review*, *32*(4), 341-51.
14. Raikkonen, O., Perala, M. L. and Kahanpaa, A. (2007). Staffing adequacy, supervisory support and quality of care in long-term care settings: Staff perceptions. *Journal of Advanced Nursing*, *60*(6), 615-26.
15. Temkin-Greener, H., Zheng, N., Katz, P., Zhao, H. and Mukamel, D. B. (2009). Measuring work environment and performance in nursing homes. *Medical Care*, *47*(4), 482-91.
16. Comondore, V. R., Devereaux, P. J., Zhou, Q., Stone, S. B., Busse, J. W., Ravindran, N. C., Burns, K. E., Haines, T., Stringer, B., Cook, D. J., Walter, S. D., Sullivan, T., Berwanger, O., Bhandari, M., Banglawala, S., Lavis, J. N., Petrisor, B., Schunemann, H., Walsh, K., Bhatnagar, N. and Guyatt, G. H. (2009). Quality of care in for-profit and not-for-profit nursing homes: Systematic review and meta-analysis. *BMJ*, *339*, b2732.

17.   Anderson, R. A. and McDaniel Jr, R. R. (1999). RN participation in organizational decision making and improvements in resident outcomes. *Health Care Management Review*, *24*(1), 7-16.

18.   Havig, A. K., Skogstad, A., Kjekshus, L. E. and Romoren, T. I. (2011). Leadership, staffing and quality of care in nursing homes. *BMC Health Services Research*, *11*, 327.

19.   Barry, T. T., Brannon, D. and Mor, V. (2005). Nurse aide empowerment strategies and staff stability: Effects on nursing home resident outcomes. *Gerontologist*, *45*(3), 309-317.

20.   Flynn, L., Liang, Y., Dickson, G. L. and Aiken, L. H. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatrics Society*, *58*(12), 2401-2406.

21.   Eaton, S. C. (2000). Beyond 'unloving care': Linking human resource management and patient care quality in nursing homes. *The International Journal of Human Resource Management*, *11*(3), 591 - 616.

22.   Taylor, J. A., Dominici, F., Agnew, J., Gerwin, D., Morlock, L. and Miller, M. R. (2012). Do nurse and patient injuries share common antecedents? An analysis of associations with safety climate and working conditions. *BMJ Quality & Safety*, *21*(2), 101-111.

23.   Hofmann, D. A. and Mark, B. (2006). An investigation of the relationship between safety climate and medication errors as well as other nurse and patient outcomes. *Personnel Psychology*, *59*(4), 847-869.

24.   Bonner, A. F., Castle, N. G., Men, A. and Handler, S. M. (2009). Certified nursing assistants' perceptions of nursing home patient safety culture: Is there a relationship to clinical outcomes? *Journal of the American Medical Directors Association*, *10*(1), 11-20.

25.   Redfern, S., Hannan, S., Norman, I. and Martin, F. (2002). Work satisfaction, stress, quality of care and morale of older people in a nursing home. *Health and Social Care in the Community*, *10*(6), 512-7.

26.   Hannan, S., Norman, I. J. and Redfern, S. J. (2001). Care work and quality of care for older people: A review of the research literature. *Reviews in Clinical Gerontology*, *11*(02), 189-203.

27.   Morgan, D. G., Semchuk, K. M., Stewart, N. J. and D'Arcy, C. (2002). Job strain among staff of rural nursing homes: A comparison of nurses, aides, and activity workers. *Journal of Nursing Administration*, *32*(3), 152-161.

28.   Pekkarinen, L., Sinervo, T., Elovainio, M., Noro, A. and Finne-Soveri, H. (2008). Drug use and pressure ulcers in long-term care units: Do nurse time pressure and unfair management increase the prevalence? *Journal of Clinical Nursing*, *17*(22), 3067-3073.

29.   Pekkarinen, L., Sinervo, T., Perälä, M. and Elovainio, M. (2004). Work stressors and the quality of life in long-term care units. *Gerontologist*, *44*(5), 633-643.

30.   Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M. and De Geest, S. (2008). Rationing of nursing care and its relationship to patient outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, *20*(4), 227-37.

31.   Schubert, M., Clarke, S. P., Glass, T. R., Schaffert-Witvliet, B. and De Geest, S. (2009). Identifying thresholds for relationships between impacts of rationing of nursing care and nurse- and patient-reported outcomes in Swiss hospitals: A correlational study. *International Journal of Nursing Studies*, *46*(7), 884-93.

32.   Schubert, M., Clarke, S. P., Aiken, L. H. and De Geest, S. (2012). Associations between rationing of nursing care and inpatient mortality in Swiss hospitals. *International Journal for Quality in Health Care*, *24*(3), 230-8.

33.	Kalisch, B. J., Tschannen, D. and Lee, K. H. (2012). Missed nursing care, staffing, and patient falls. *Journal of Nursing Care Quality*, *27*(1), 6-12.

34.	Sochalski, J. (2004). Is more better?: The relationship between nurse staffing and the quality of nursing care in hospitals. *Medical Care*, *42*(2 Suppl), II67-73.

35.	Ausserhofer, D., Schubert, M., Desmedt, M., Blegen, M. A., De Geest, S. and Schwendimann, R. (2013). The association of patient safety climate and nurse-related organizational factors with selected patient outcomes: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(2), 240-52.

36.	Kalisch, B. J. and Xie, B. (2014). Errors of omission: Missed nursing care. *Western Journal of Nursing Research*, *36*(7), 875-890.

37.	Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E. and Griffiths, P. (2014). 'Care left undone' during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality & Safety*, *23*(2), 116-25.

38.	Lucero, R. J., Lake, E. T. and Aiken, L. H. (2010). Nursing care quality and adverse events in US hospitals. *Journal of Clinical Nursing*, *19*(15-16), 2185-95.

39.	André, B., Sjøvold, E., Rannestad, T. and Ringdal, G. I. (2014). The impact of work culture on quality of care in nursing homes - a review study. *Scandinavian Journal of Caring Sciences*, *28*(3), 449-457.

40.	Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and de Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

41.	Schmidt, S. G., Dichter, M. N., Schwab, C. G., Bartholomeyczik, S. and Hasselhorn, H. M. (2014). [Satisfaction with the quality of care in nursing homes--the nurses' perspective]. *Pflege Zeitschrift*, *67*(3), 170-4.

42.	Simon, M., Schmidt, S. G., Schwab, C. G., Hasselhorn, H. M. and Bartholomeyzcik, S. (2013). [Determining the quality of long-term care. A comparative analysis of transparency criteria, resident-related indicators, and staff assessment]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*, *56*(8), 1088-97.

43.	Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J. A., Busse, R., Clarke, H., Giovannetti, P., Hunt, J., Rafferty, A. M. and Shamian, J. (2001). Nurses' reports on hospital care in five countries. *Health Affairs*, *20*(3), 43-53.

44.	Kutney-Lee, A., Lake, E. T. and Aiken, L. H. (2009). Development of the Hospital Nurse Surveillance Capacity Profile. *Research in Nursing & Health*, *32*(2), 217-28.

45.	Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health*, *25*(3), 176-88.

46.	Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R. and Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, *6*, 44.

47.	Akhtar, S. and Lee, J. S. (2002). Confirmatory factor analysis and job burnout correlates of the Health Professions Stress Inventory. *Psychological Reports*, *90*(1), 243-50.

48.	Wolfgang, A. P. (1988). The Health Professions Stress Inventory. *Psychological Reports*, *62*(1), 220-2.

49.	Schubert, M., Glass, T. R., Clarke, S. P., Schaffert-Witvliet, B. and De Geest, S. (2007). Validation of the Basel Extent of Rationing of Nursing Care instrument. *Nursing Research*, *56*(6), 416-24.

50.	Field, A. (2009). *Discovering statistics using SPSS*. London: Sage.

51. Scott-Cawiezell, J., Schenkman, M., Moore, L., Vojir, C., Connoly, R. P., Pratt, M. and Palmer, L. (2004). Exploring nursing home staff's perceptions of communication and leadership to facilitate quality improvement. *Journal of Nursing Care Quality*, *19*(3), 242-52.

52. Xyrichis, A. and Ream, E. (2008). Teamwork: A concept analysis. *Journal of Advanced Nursing*, *61*(2), 232-41.

53. Anderson, R. A., Toles, M., Corazzini, K., McDaniel Jr, R. R. and Colon-Emeric, C. S. (2014). Local interaction strategies and capacity for better care in nursing homes: A multiple case study. *BMC Health Services Research*, *14*(1), 244.

54. Colon-Emeric, C. S., McConnell, E., Pinheiro, S. O., Corazzini, K., Porter, K., Earp, K. M., Landerman, L., Beales, J., Lipscomb, J., Hancock, K. and Anderson, R. A. (2013). CONNECT for better fall prevention in nursing homes: Results from a pilot intervention study. *Journal of the American Geriatrics Society*, *61*(12), 2150-2159.

55. Bowers, B. J., Esmond, S. and Jacobson, N. (2000). The relationship between staffing and quality in long-term care facilities: Exploring the views of nurse aides. *Journal of Nursing Care Quality*, *14*(4), 55-64; quiz 73-5.

56. Murphy, K. (2007). A qualitative study explaining nurses' perceptions of quality care for older people in long-term care settings in Ireland. *Journal of Clinical Nursing*, *16*(3), 477-85.

57. McGilton, K. S., Boscart, V. M., Brown, M. and Bowers, B. (2014). Making tradeoffs between the reasons to leave and reasons to stay employed in long-term care homes: Perspectives of licensed nursing staff. *International Journal of Nursing Studies*, *51*(6), 917-26.

58. Caspar, S., Cooke, H. A., O'Rourke, N. and MacDonald, S. W. (2013). Influence of individual and contextual characteristics on the provision of individualized care in long-term care facilities. *Gerontologist*, *53*(5), 790-800.

59. Kramer, M. and Schmalenberg, C. (2005). Revising the essentials of magnetism tool: There is more to adequate staffing than numbers. *Journal of Nursing Administration*, *35*(4), 188-98.

60. Jones, M. C. and Johnston, D. (2013). Do mood and the receipt of work-based support influence nurse perceived quality of care delivery? A behavioural diary study. *Journal of Clinical Nursing*, *22*(5-6), 890-901.

61. Scott-Cawiezell, J., Main, D. S., Vojir, C. P., Jones, K., Moore, L., Nutting, P. A., Kutner, J. S. and Pennington, K. (2005). Linking nursing home working conditions to organizational performance. *Health Care Management Review*, *30*(4), 372-80.

62. Kieft, R. A., de Brouwer, B. B., Francke, A. L. and Delnoij, D. M. (2014). How nurses and their work environment affect patient experiences of the quality of care: A qualitative study. *BMC Health Services Research*, *14*, 249.

63. McCormack, B. (2004). Person-centredness in gerontological nursing: An overview of the literature. *Journal of Clinical Nursing*, *13*(3a), 31-8.

64. Sjogren, K., Lindkvist, M., Sandman, P. O., Zingmark, K. and Edvardsson, D. (2013). Person-centredness and its association with resident well-being in dementia care units. *Journal of Advanced Nursing*, *69*(10), 2196-205.

65. Custers, A. F., Westerhof, G. J., Kuin, Y. and Riksen-Walraven, M. (2010). Need fulfillment in caring relationships: Its relation with well-being of residents in somatic nursing homes. *Aging & Mental Health*, *14*(6), 731-9.

66. van den Pol-Grevelink, A., Jukema, J. S. and Smits, C. H. (2012). Person-centred care and job satisfaction of caregivers in nursing homes: A systematic review of the impact of different forms of person-centred care on various dimensions of job satisfaction. *International Journal of Geriatric Psychiatry*, *27*(3), 219-29.

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67.   Suhonen, R., Charalambous, A., Stolt, M., Katajisto, J. and Puro, M. (2013). Caregivers' work satisfaction and individualised care in care settings for older people. *Journal of Clinical Nursing*, *22*(3-4), 479-90.

68.   Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R. (2013). *[Survey of care workers in Swiss nursing homes - final report]*. Basel: Universität Basel. Retrieved from http://nursing.unibas.ch/shurp

CHAPTER 7

AFFECTIVE ORGANIZATIONAL COMMITMENT IN SWISS NURSING HOMES: A CROSS-SECTIONAL STUDY

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7.1. Abstract

Purpose of the study. This substudy of the Swiss Nursing Homes Human Resources Project (SHURP) explored the relationships between affective organizational commitment (AOC) levels and organizational, situational, and care personnel characteristics, and between AOC and care personnel outcomes.

Designs and Methods. SHURP was a representative national cross-sectional study in 163 Swiss nursing homes. Its data sources were: 1) a care personnel questionnaire, 2) a facility questionnaire, 3) a unit questionnaire, and 4) administrative resident data. Generalized estimating equations (GEEs) were applied to examine AOC's relationships with selected antecedents and care personnel outcomes.

Results. Data were collected from 5323 care personnel in 163 nursing homes (return rate: 76%). On a scale from 1-5, the mean level of AOC was 3.86 (SD=0.81). Variations in AOC regarding care personnel characteristics (age, education, and experience in nursing home) and organizational characteristics (size, profit status) were statistically significant with minimal effect sizes. The main factors positively related to AOC were leadership, job satisfaction, quality of care, and collaboration with the nursing home director. Care personnel outcomes significantly related to higher AOC were reduced intention to leave, health complaints, presenteeism, and absenteeism.

Implications. As leadership is a crucial factor of affective organizational commitment, its development might improve care personnel outcomes such as intention to leave or absenteeism.

7.2. Introduction

Organizational commitment (OC) is an organizational concept widely examined in different settings due to its importance for organizational performance and effectiveness. Meyer and Allen [1] developed a broadly accepted framework to analyze OC in terms of its affective, continuance, and normative aspects. The first of these, affective organizational commitment (AOC), refers to employees' emotional attachment to, identification with, and involvement in the organization [1]. Affectively committed organizational members stay with the organization because they believe in and support its goals and values [2].

High AOC is related to innovation, performance, motivation of employees, and staff satisfaction [3]. Lack of AOC has been identified as a predictor for nursing home staff turnover [4, 5]. In today's nursing shortage environment, recruitment and retention of healthcare personnel are major challenges. Accordingly, a clear understanding of the antecedents and consequences of AOC of care workers in nursing homes can be helpful in designing policies and interventions to increase staff commitment and reduce turnover. This substudy of the Swiss Nursing Homes Human Resources Project (SHURP) explores the relationships between AOC levels and organizational, situational, and care personnel characteristics, and between AOC and care personnel outcomes.

7.2.1. Conceptual framework

The conceptual model in Figure 1 illustrates the relationship between antecedents and AOC, and between AOC and care personnel outcomes. It is based on the commitment framework developed by Meyer and Allen [1], adapted by Westphal and Gmür [2] and complemented according to a literature review on AOC in nursing homes.
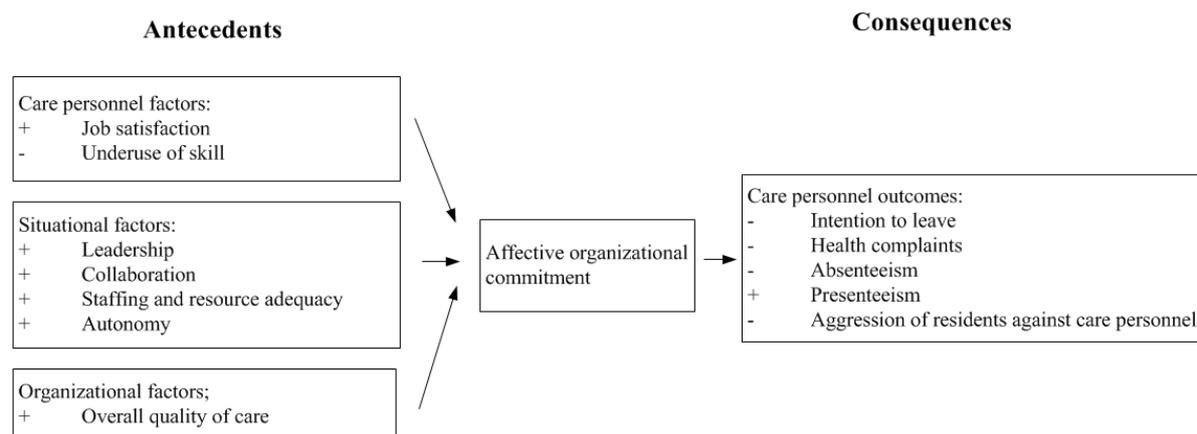
Figure 1. *Model of antecedents and consequences of affective organizational commitment examined in Swiss Nursing Homes Human Resources Project and expected relationships (+: positive relationship, - : negative relationship)*

Antecedents of AOC. Antecedents linked to AOC can be differentiated into care personnel factors, situational factors (affecting an individual employee's situation), and organizational factors (affecting the situation of all employees) [2].

As for care personnel factors, several studies found a significant positive relationship between job satisfaction and AOC in the long-term sector [6-8]. Care workers who feel more satisfied with their job feel also more affection and commitment for their organization. Additionally, MacLeod and Clarke [9] found that individuals who can effectively use their skills feel more engaged at work and are more committed to their organization's goals and values. Accordingly, the current study examines "underuse of skill" as a predictor of AOC, a variable not previously studied in the nursing home setting.

Situational factors include leadership, collaboration, staffing and resources adequacy, and autonomy. Two studies showed that transformational leadership and higher supervisor support were related to higher AOC in nursing homes [6, 10]. The perceived support by the organization is expected to enhance AOC, since employees are willing to involve themselves in the organization if they perceive the organization's willingness to fulfill its obligation to

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them [6]. A recent study, however, found no significant direct relation between supervisor support and AOC [7]; the relationship was mediated by job satisfaction. Little is known of the relationship between collaboration with nurse director, nursing home administrator, or team colleagues and AOC in nursing homes. A good collaboration with superiors might enhance AOC, since it reflects an organization's supportive trait.

If an organization provides the context in which employees are able to provide high service quality, higher commitment is expected [11]. This might be reflected on one hand in the relationship between AOC and workload, which in this study is measured in the form of perceived staffing and resource adequacy. Some researchers have suggested a linear relationship between higher workload and lower AOC [5, 8]. However, Rodwell and colleagues [10] have concluded that both high and low levels of job demand led to lower AOC, while moderate levels of demand lead to higher AOC. On the other hand, more job autonomy might be related to higher AOC by allowing care workers to provide high quality of care. Steffen and colleagues [11] found that increased job autonomy was associated with higher AOC.

Finally, Karsh and colleagues [5] found that the organizational quality environment was the strongest antecedent of commitment, which included aspects such as time provided for improvement, and the degree to which the organization rewarded quality. This leads us to expect that a higher overall quality of care should be positively related to AOC.

Outcomes of AOC. Two studies in the nursing home setting found that AOC is an important predictor of intention to leave or staff turnover [4, 5]. Committed employees are interested to stay in their organization. Schalk [12] found that higher AOC was related to less reported health complaints. A possible mechanism between AOC and health complaints might be that higher commitment protects employees from the effect of stressors [13]. In a meta-analysis, Meyer and colleagues [13] found that AOC was negatively related to absenteeism, though more strongly with voluntary than with involuntary absenteeism. To our knowledge,

no study examined the relationship between AOC and absenteeism or presenteeism, i.e. attending work while ill, in nursing homes. A recent study in nursing homes showed that high commitment towards residents and colleagues resulted in higher presenteeism [14], but it remains unclear whether commitment towards the organization is also a factor. It might be expected that care personnel with a higher AOC will show higher presenteeism, since emotional involvement with the organization increases the desire to be present and uphold the quality of residents' care, which might suffer from a reduced workforce. As for the experience of aggression, a longitudinal study in various healthcare settings showed that higher patient-inflicted violence significantly predicted lower AOC [15]. It can be assumed that this is also the case for resident aggression, however empirical evidence is missing.

7.2.2. Aim of the study

To date, few studies have comprehensively addressed AOC in nursing homes. Specifically, little knowledge exists on differences in AOC levels in relation to facility size, catchment area, profit status, and personnel education levels. Various known antecedents and consequences have yet to be included in nursing home studies. Therefore, this substudy aimed to develop a comprehensive understanding of AOC's antecedents and consequences regarding care personnel in nursing homes. Our objectives were: 1) to describe the level of AOC among care personnel in Swiss nursing homes; 2) to describe differences in AOC across subgroups in relation to facility size, catchment area, language region, profit status, and personnel gender, age, level of education, and nursing home experience; 3) to examine relationships between care personnel, situational and organizational factors as antecedents of AOC, and 4) to examine AOC's relationships with selected care personnel outcomes in Swiss nursing homes, as well as personnel's experience of resident aggression.

7.3. Design and methods

7.3.1. Study context and design

This observational substudy was part of the Swiss Nursing Homes Human Resources Project (SHURP) [16] – a representative national cross-sectional study (2011-2013) in Swiss nursing homes. SHURP was devised to explore the relationships between various nursing home characteristics, e.g., work environment, and care personnel and resident outcomes. It was approved by the leading ethics committee of the state of 'Beider Basel' (Ref.Nr. EK:02/12) and by all ethics committees of cantons where nursing home administrators agreed to participate.

7.3.2. Setting and sample

To select a representative sample of at least 10% of Switzerland's 1'600 nursing homes, stratified random sampling was applied, using language region (German-, French- and Italian-speaking) and facility size (small: < 50beds, medium: 50-99 beds, large: >99 beds) as strata. Inclusion criteria were official recognition as a nursing home, a bed capacity of at least 20 residents, and a staff of at least 15 care personnel directly involved in resident care. Retirement homes and assisted living facilities were excluded. For this substudy, the full dataset of SHURP was used.

Within each participating nursing home, the care personnel (i.e., registered nurses (3-6 years' education), licensed nurses (3 years' education), certified assistant nurses (1-2 years' education), and nurse aids (trained on the job)) who provided direct care, understood German, French, or Italian, and had been working for at least one month on their unit for at least 8 hours/week, were invited to participate in a questionnaire survey. Students and volunteers were excluded.

7.3.3. Variables and measurement

Data were collected from four sources: 1) the care personnel questionnaire, 2) the facility questionnaire, 3) the unit questionnaire, and 4) administrative data on residents.

Care personnel's age (year), gender (male/female), level of education (registered nurse/licensed nurse/certified assistant nurse/nurse aide), country of basic professional training (Switzerland/Germany/Italy/France/other), and nursing home experience (years) were collected from all care personnel using the personnel questionnaire. Data on facility size (number of beds), catchment area (rural/urban), language region (German/French/Italian) and profit status (public/private subsidized/private) were extracted from the facility questionnaire. In the unit questionnaire, the percentage of residents per unit either diagnosed with dementia or with dementia symptoms (but not yet diagnosed with dementia) was assessed. Nursing home resident data included the mean age, mean length of stay, and mean care load per unit. The calculation for the last item was based on the national health insurers' reimbursement schedule. This includes a total of 12 reimbursement levels, one of which is allocated to each nursing home resident. Each increase in level represents an increase in 20 minutes of daily care time.

In accordance with the conceptual model described in Figure 1, further variables were measured using existing scales or single items that were adapted to the nursing home context. Table 1 provides an overview of items and scales used in the study.

Table 1. *Overview of items and scales for the measurement of antecedents and consequences of AOC*

Concept measured	Instrument used Number of items / Number of response categories (Anchors of answer options)[1]	Items	Scale calculation
Affective organizational commitment (AOC)			
Affective organizational commitment (AOC)	Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem Commitment gegenüber der Organisation, dem Beruf/der Tätigkeit und der Beschäftigungsform (COBB) [17][2] 5 / 5 (1=strongly disagree to 5=strongly agree)	- I would be very happy to spend the next years with this organization - I feel a strong sense of "belonging" to my organization - I do not feel "emotionally attached" to this organization - I am proud of working in this organization - I think, my ideals about good care fit with the ideals of this organization	Cronbach's α: 087 Corrected item-total correlation coefficients ranged between 0.50 and 0.79, showing that all items measure same construct. Due to left skew, building of 3 groups based on mean rating over 5 items: 1=low AOC (1-2.99: corresponding to ratings in strongly disagree / rather disagree) 2=moderate AOC (3-3.99, corresponding to neutral) 3= high AOC (4 and higher, corresponding to rather agree / strongly agree)
Antecedents of AOC – Care personnel factors			
Underuse of skill	Health Professions Stress Inventory (HPSI) [18] 1 / 5 (0=never to 4 =very often)	How often do you feel stressed because you are not able to use all of your skills on the job?	
Job satisfaction – general rating	Investigator-developed 1 / 4 (1=very dissatisfied to 4=very satisfied)	How satisfied are you overall with your current job in this nursing home?	
Antecedents of AOC – Situational factors			
Collaboration	Investigator-developed based on Safety Attitudes Questionnaire (SAQ): [19] 3 / 4 (1=very low to 4=very high)	With respect to your experiences on this unit, use the scale to describe the quality of collaboration that you have experienced with: - team colleagues on your unit - upper nurse management / director of nursing - nursing home administrator	
Autonomy	Investigator-developed 1 / 4 (1=strongly disagree to 4=strongly agree)	I can decide on my own how to go about doing my work	

Concept measured	Instrument used **Number of items / Number of response categories (Anchors of answer options)[1]**	Items	Scale calculation
Antecedents of AOC – Situational factors (cont'd)			
Leadership	Practice Environment Scale – Nursing Work Index [20] 5 / 4 (1=strongly disagree to 4=strongly agree)	- A supervisory staff that is supportive of the care workers - Supervisors use mistakes as learning opportunities, not criticism - A nurse/unit manager who is a competent leader. - Praise and recognition for a job well done - A nurse/unit manager who backs up the care worker staff in decision making, even if the conflict is with other professions	Cronbach's α: 0.84 Mean over all items of the subscale. Respondents with answers in at least one item were counted. Higher number means better leadership.
Staffing and resource adequacy	Practice Environment Scale – Nursing Work Index [20] 3 / 4 (1=strongly disagree to 4=strongly agree)	- Enough time and opportunity to discuss resident care problems with other care workers. - Enough registered nurses/qualified personnel to provide quality resident care. - Enough staff to get the work done	Cronbach's α: 0.74 Mean over all items of the subscale. Respondents with answers in at least one item were counted. Higher number means better staffing and resource adequacy.
Antecedents of AOC – Organizational factors			
Overall quality of care	RN4CAST [2] study questionnaire, adapted for NH-use 1 / 4 (1=very low to 4=very high)	In general, how would you rate the quality of care for the residents on your unit?	
Consequences of AOC – Care personnel outcomes			
Health complaints	Swiss Health Survey [21] 5 / 3 (1=not at all to 3=strongly)	Did you suffer from any of the following conditions in the last 4 weeks: - Back pain, low-back pain - General weakness, tiredness, lack of energy - Problems with sleeping - Headache, pressure in your head or pain in your face - Pain in your joints or limbs	Cronbach's α: 0.70 Index was calculated as sum over items minus 5 (so that index starts with 0 for "no health complaints") Higher number means more health complaints

Concept measured	Instrument used Number of items / Number of response categories (Anchors of answer options)[1]	Items	Scale calculation
Consequences of AOC – Care personnel outcomes (cont'd)			
Intention to leave	2 items from the Michigan Organizational Assessment Questionnaire (MOAQ) [22] 1 item from Mobley, Horner & Hollingsworth [23] 3 / 5 (1=strongly disagree to 5=strongly agree)	- I often think about quitting my job - I will probably look for a new job in the next year - I am currently looking for another job (in another organization)	Cronbach's α: 0.91 Scale is calculated as sum over all items minus 3 (so that index starts with 0 for no intention to quit) ranging from 0 to 12. Due to left skew 3 groups were built: 1=low intention (0), 2 = medium intention (1-3), 3= high intention (4-12)
Absenteeism	Swiss Health Survey [21] 1 / number	How many days have you been off work due to your own illness in the last 4 weeks?	Building of 3 groups: 0=no day, 1=1-2 days, 2=3 and more days
Presenteeism	Investigator-developed 1 / number	How many days have you gone to work in spite of feeling ill and unfit for work in the last 4 weeks?	Building of 3 groups: 0=no day, 1=1-2 days, 2=3 and more days
Aggressive behavior against care personnel	RN4CAST[2]-nurse questionnaire, differentiation of verbal, physical and sexual aggression, description based on Ryden's Aggression scale [24] 3 single items / 6 (0=never to 5=several times a day)	Please indicate, how often residents directed any of the following behaviors against you during the past 4 weeks: - verbally aggressive behavior (e.g. cursing , name calling, hostile or obscene language, verbal threats) - physically aggressive behavior (e.g. making threatening gesture, pushing, hitting, kicking, throwing an object, scratching, spitting, pulling hairs) - sexually aggressive behavior (e.g. making obscene gesture, hugging against your will, touching intimate body parts)	Grouping of answers due to left skew: Verbal and physical aggression: 3 groups: 0=never, 1=less than once a week or once a week, 2=more than once a week to several times a day Sexual aggression: 2 groups: 0=never, 1=less than once a week to several times a day

[1] Missing values were coded as -99

[2] Questionnaire for the assessment of affective, continuant, and normative commitment towards the organization, profession / activity and employment

[3] RN4CAST: Nurse forecasting in Europe, a study on the impact of nurse deployment on patient safety [25]

7.3.4. Data collection and management

In each nursing home, a contact person was identified to support the research team with questionnaire logistics. To ensure proper handling of questionnaires, the research team informed the contact person, the nursing home administrators, and the care personnel about the study protocol and data collection procedure via written study information. The respective questionnaires were distributed to the care personnel and nursing home administrators between May 2012 and April 2013. The personnel questionnaire was distributed via the nursing home internal mail delivery systems and included postage-paid return envelopes. Completing the questionnaire and sending it back to the research team was considered as informed consent. The nursing home administrators completed the facility and unit questionnaires either electronically or returned it in hard copies. The response rate per unit of each nursing home was checked on the basis of unit-specific numerical codes assigned to each questionnaire and reported back to the nursing home after 3 weeks of data collection. Data quality (e.g. completeness, plausibility) was verified by members of the SHURP research team.

Data omitted from the facility and unit questionnaires were provided by checking with the facilities' coordinators. Data missing from the personnel questionnaire could not be completed due to the survey's anonymity. A missing value analysis was performed to identify frequency and response patterns. No variable had more than 5% missing data. Listwise deletion was applied in the analyses.

7.3.5. Data analysis

Descriptive statistics were calculated using appropriate measures of central tendency, frequencies, and percentages. To comply with aim 1, the total AOC score was calculated for the entire sample. As proposed for aim 2, scores were calculated for each relevant subgroup, and inter-subgroup differences were calculated as appropriate using either one-way ANOVA or nonparametric tests.

To fulfill aim 3, a multiple regression model employing Generalized Estimating Equations (GEE) was used to test the relationships between AOC (dependent variable) and antecedents (independent variables). As a first step, as AOC data were skewed, a Spearman's rank-order test was performed to check for correlations between the predictors and AOC scores. Coefficients with p-values of $<.20$ were included in the multiple regression model. Multicollinearity was tested by calculating a variance inflation factor (VIF), with the cut-off set at <2. For the GEE model, an ordinal logistic regression was applied, comparing groups with moderate or higher AOC with low AOC (cf. Table 1 for grouping of AOC variable). The adjusted model controlled for care personnel and facility characteristics. Using Stata/IC$^®$ 13.1, a separate multilevel ordinal logistic regression was performed, this time treating units and facilities as random effects and controlling for the nestedness of data within units and facilities. While controlling for data nestedness within facilities based on likelihood ratios improved the model, controlling for the units did not. Therefore, facility was used as the GEE subject variable. A post-hoc ANOVA sensitivity analysis was performed to examine the variability of job autonomy ratings based on educational background of respondents.

Aim 4 included an analysis of the associations between AOC (independent variable) and care personnel outcomes (dependent variables). For each dependent variable, a separate, adjusted GEE model was calculated using the facility as the subject variable. The adjusted models of the care personnel outcomes were controlled for the same variables as mentioned above. The adjusted models to test the effects of resident aggression were additionally controlled for resident care load and the percentage of residents with dementia or symptoms of dementia per unit.

Data were analyzed using IBM$^©$ SPSS$^©$ Statistics for Windows$^©$, Version 20.0 software (Armonk, NY: IBM Corp.). Because of the large sample and multiple testing, a p-value of <0.01 was considered significant for all inferential statistical tests.

7.4. Results

7.4.1. Sample characteristics

A total of 163 facilities were included with 5323 care workers responding (response rate: 76.3%). Of the facilities, 46.0% were medium-size (50-99 beds), 60.7% were situated in rural areas and 36.8% were public facilities. About one third of the care personnel were older than 50 years. Half had fewer than 5 years' professional experience in nursing homes and about one third were registered nurses. More detailed characteristics are presented in Table 2.

Table 2: *Sample characteristics*

Facility characteristics (n =163)	n	Percentages
Facility size (number of beds)		
Small (<50 beds)	64	39.3%
Medium (50-99 beds)	75	46.0%
Large (> 99 beds)	24	14.7%
Catchment area		
Rural area	99	60.7%
Urban area	64	39.3%
Profit status		
Public	60	36.8%
Private, publicly subsidized	44	27.0%
Private	59	36.2%
Language region		
German-speaking	123	75.5%
French-speaking	31	19.0%
Italian-speaking	9	5.5%
Care personnel characteristics (n=5323)	**n**	**Percentages**
Gender (n=5265)		
Female	4831	91.8%
Age (n=5179)		
≤30 years	1036	20.0%
31 – 40 years	891	17.2%
41 – 50 years	1481	28.6%
> 50 years	1771	34.2%
Education (n=5268)		
Registered nurses (3-6 year education)	1633	31.0%
Licensed nurses (3 year education)	1170	22.2%
Certified assistant nurses (1-2 year education)	906	17.2%
Nurse aides (on the job training)	1380	26.2%
Others	179	3.4%
Country of basic professional training in care (N=5046)		
Switzerland	4129	81.8%
Germany	292	5.8%
Italy	84	1.7%
France	167	3.3%
Others	347	7.4%

Care personnel characteristics (n=5323) (cont'd)	n	Percentages
Experience in nursing home (n=5029)		
< 5 years	2576	51.3%
5 – 10 years	1053	20.9%
10 – 15 years	720	14.3%
15 – 20 years	328	6.5%
> 20 years	352	7.0%
Unit characteristics (n=429)	**n**	**M (SD)**
Percentage of residents with symptoms of dementia	429	61.4 (25.1)
Mean age of residents	413	84.6 (3.1)
Mean length of stay of residents (days)	412	1233.0 (433.0)
Mean care load of residents	407	5.9 (1.6)

7.4.2. General level and variability between AOC levels

The overall mean AOC score was 3.86 (SD=0.81) of a possible 5, with almost half (43%) of all care personnel reaching high (>4.001) scores. AOC scores differed significantly between care personnel based on their facilities' sizes, their age, level of education, and experience in nursing home, but not for gender. Between facilities, scores varied by profit status, catchment area, size, and language region (Table 3).

Table 3: *Differences of AOC between facility characteristics and care personnel subgroups*

	n	mean	SD	F-Statistic	p-value	ω^2
Whole sample	5315	3.86	0.81			
Facility size (number of beds) (n=5315)						
small (<50 beds)	1142	3.95	0.83			
medium (50-99 beds)	2751	3.89	0.81	$F(2,5312)=13.427$	0.000	0.005
large (> 199 beds)	1422	3.79	0.80			
Catchment area (n=5315)						
urban area	1892	3.85	0.80	$F(1,5313)=4.428$	0.035	0.001
rural area	3333	3.90	0.81			
Language region (n=5315)						
German	4668	3.88	0.80			
French	795	3.86	0.82	$F(2,5312)=0.954$	0.385	0.000
Italian	254	3.94	0.90			
Profit status (n=5315)						
public	2240	3.83	0.81			
private subsidized	1345	3.89	0.81	$F(2,5312)=7.311$	0.001	0.003
private	1730	3.93	0.80			
Gender (n=5259)						
female	4825	3.88	0.81	$F(1,5257)=0.002$	0.969	0.000
male	434	3.88	0.86			
Age categories (n=5173)						
≤ 30 years	1036	3.72	0.84			
31 – 40 years	880	3.90	0.80	$F(3,5169)=18.619$	0.000	0.011
41 -50 years	1478	3.94	0.79			
> 50 years	1770	3.93	0.80			

	n	mean	SD	F-Statistic	p-value	ω^2
Level of education (n=5262)						
registered nurses	1628	3.86	0.83			
licensed nurses	1170	3.82	0.81			
certified assistant nurses	904	3.83	0.82	F(4,5257)=6.376	0.000	0.005
nurse aides	1380	3.96	0.76			
others	180	3.95	0.85			
Experience in nursing home (n=5023)						
< 5 years	2573	3.83	0.84			
5 – 10 years	1051	3.90	0.78			
10 -15 years	719	4.00	0.78	F(4,5018)=13.716	0.000	0.011
15 – 20 years	328	4.04	0.76			
> 20 years	352	4.06	0.71			

Notes: SD=Standard Deviation; ω^2=effect size, proportion of variance accounted for by variable under consideration, expected values: 0.01 for small effect, 0.06 for medium effect, 0.14 for large effect [26].

7.4.3. Antecedents of AOC

Statistically significant AOC antecedents were leadership (Odds ratio (OR)= 2.93), job satisfaction (OR= 2.63), overall quality of care (OR= 2.02), collaboration with nursing home director (OR= 1.63), collaboration with director of nursing (OR= 1.49), collaboration with colleagues (OR= 1.27), and staffing and resource adequacy (OR= 1.42). Underuse of skills was related to lower AOC scores (OR= .83). The relationship between AOC and job autonomy was not statistically significant (Table 4).

7.4.4. Influence of AOC on care personnel outcomes

The following outcomes were significantly inversely related to higher AOC: intention to leave (OR= .10), health complaints (OR= .42), and both presenteeism (OR= .63) and absenteeism (OR= .76). As for resident aggression towards care personnel, higher AOC was significantly related to less experience of all forms of aggression (physical: OR= .83, sexual: OR= .81, and verbal: OR= .81) (Table 5).

Table 4: *Antecedents of AOC, multivariable GEE model*

	AOC[1] unadjusted						AOC[1] adjusted[2]					
	B	SE	OR	95% CI OR			B	SE	OR	95% CI OR		
Underuse of skill	-.21***	.04	.81	.75	–	.87	-.19***	.04	.83	.77	–	.90
Job satisfaction	.96***	.09	2.62	2.20	–	3.11	.97***	.09	2.63	2.20	–	3.14
Collaboration with colleagues	.19*	.07	1.20	1.04	–	1.39	.24**	.07	1.27	1.10	–	1.47
Collaboration with director of nursing	.43***	.08	1.53	1.32	–	1.77	.40***	.08	1.49	1.29	–	1.73
Collaboration with nursing home director	.49***	.07	1.63	1.42	–	1.88	.49***	.07	1.63	1.48	–	1.87
Autonomy	.13*	.06	1.14	1.04	–	1.29	.10	.06	1.10	.98	–	1.24
PES-NWI Staffing	.31***	.08	1.37	1.18	–	1.59	.35***	.08	1.42	1.22	–	1.65
PES-NWI Leadership	.89***	.10	2.44	2.02	–	2.95	1.08***	.10	2.93	2.43	–	3.53
Overall quality of care	.67***	.08	2.06	1.75	–	2.43	.70***	.08	2.02	1.72	–	2.37

Notes: B=Unstandardized regression coefficient; SE=Standard error, OR=Odds ratio, CI=Confidence interval, PES-NWI=Practice Environment Scale – Nursing Work Index;
***p<0.001 **p<0.01 *p<0.05
[1] 3 groups: low, moderate, high commitment
[2] The adjusted model was controlled for care personnel characteristics (gender, age, education, experience in nursing home), and facilities characteristics (language region, profit status, catchment area (urban/rural), facility size)

Table 5: *Influence of AOC on care personnel outcomes, univariable GEE models*

Care personnel outcome	unadjusted						adjusted[1,2]					
	B	SE	OR	95% CI OR			B	SE	OR	95% CI OR		
Health complaints [3]	-.90***	.05	.41	.37	–	.45	-.88***	.05	.42	.38	–	.46
Intention to leave [4]	-2.22***	.06	.11	.10	–	.12	-2.26***	.06	.10	.09	–	.12
Absenteeism [4]	-.30***	.05	.74	.67	–	.82	-.27***	.05	.76	.67	–	.84
Presenteeism [4]	-.48***	.04	.62	.57	–	.67	-.46***	.04	.63	.58	–	.69
Frequency of verbal aggression from residents against care personnel[4]	-.03***	. 04	.78	.73	–	.85	-.21***	.04	.81	.75	–	.87
Frequency of physical aggression from residents against care personnel[4]	-.20***	.05	.82	.75	–	.89	-.18***	.05	.83	.76	–	.91
Frequency of sexual aggression from residents against care personnel[5]	-.25***	.05	.78	.71	–	.86	-.22***	.05	.81	.73	–	.88

Notes: B=Unstandardized regression coefficient; SE=Standard error, OR=Odds ratio, CI=Confidence interval; ***$p<0.001$

[1] The adjusted models were controlled for care personnel characteristics (gender, age, education, experience in nursing home), and facility characteristics (language region, profit status, catchment area (urban/rural), facility size)

[2] The adjusted models for verbal, physical, and sexual aggression were controlled for care personnel characteristics (gender, age, education, experience in nursing home), facility characteristics (language region, profit status, catchment area (urban/rural), facility size), and residents characteristics (percentage of residents with diagnosis or symptoms of dementia, residents' care load mean)

[3] Linear regression

[4] Ordinal logistic regression

[5] Binary logistic regression

7.5. Discussion

This substudy provided a comprehensive understanding of AOC among care personnel in Swiss nursing homes, its antecedents and its consequences for personnel. Though AOC level differences were statistically significant in relation to several care personnel and facility characteristics, effect sizes were very small, showing little clinical significance of the differences found. The model of AOC antecedents and consequences in nursing homes was mostly supported by the results: the strongest predictors for AOC were leadership, job satisfaction, and overall quality of care. Against expectations, job autonomy was not significantly related to AOC. As for the selected care personnel outcomes, AOC was a significant negative predictor for intention to leave and health complaints. Contradicting the model, AOC was also negatively related to presenteeism, i.e., care personnel with higher AOC scores showed less presenteeism.

7.5.1. General level of AOC and differences in AOC

Confirming other studies' observations, the overall mean AOC score of 3.86 was high [27, 28]. Aged care staff generally report high AOC, despite the challenges and stresses they face [27, 28]. In this study, care personnel and facility characteristics contributed little to our study sample's AOC variance. Consistent with the results of two meta-analyses [2, 13], the present study correlated age and length of tenure positively, albeit weakly, with AOC. For the other variables, previous research has provided contradictory results. The rarity of corroboration regarding findings may result from differences in national or organizational cultures and the use of different instruments to measure AOC. Overall, the results indicate that work environment characteristics are more influential in explaining AOC than care personnel or facility characteristics.

7.5.2. Antecedents

The most influential antecedent of AOC was leadership. With an increase of one unit in the rating of leadership–from "rather disagree" to "rather agree"–the odds of being in the group with high commitment versus moderate or low commitment increased by a factor of almost three. Several meta-analyses [13, 29] and individual studies [6, 30] have observed significant relationships between different leadership styles, such as transformational leadership, and AOC. According to Bass [31], the subdimensions of transformational leadership are idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. In the present study, leadership was measured with the PES-NWI leadership subscale, which does not cover aspects of transformational leadership, but rather puts focus on leaders' competence and support. Our results show that care personnel are more committed when their leadership is supportive, mistakes are treated as learning opportunities, the leaders are competent, the care personnel receive praise and recognition, and care personnel are involved in decision-making processes. The importance of supportive leadership for AOC might be based on the principle of reciprocity: employees who feel supported by their organization might reciprocate with their commitment [32]. The results indicate that leadership development might be an important factor in fostering AOC.

The finding of a significant positive relationship between AOC and job satisfaction was consistent with those of a number of studies in the long-term care sector [6, 7]. In general, researchers agree that job satisfaction and AOC are separate concepts: job satisfaction is a specific short-term response to a specific task environment, job or job facets, and is less stable than AOC. A broader concept, AOC reflects the individual's sense of belonging to the organization as a whole–a sense which develops slowly but consistently over time [33]. Care personnel's job satisfaction is crucial in developing their motivation and efficiency, and enhances AOC. Both are supported by similar workplace characteristics. For job satisfaction, these include the nature of work, leadership, communication, satisfaction

with co-workers, promotion opportunities, operating procedures, appreciation, recognition and rewards for good work, care quality, fringe benefits, and pay [34, 35]. Castle and colleagues [34] observed that recent quality improvements in nursing homes may have a positive impact on job satisfaction among care personnel, thereby fostering AOC and reducing turnover.

Accordingly, overall quality of care has emerged as an extremely influential antecedent of AOC. Karsh and colleagues [5] found that commitment's strongest association was with the organizational quality environment. It can be expected that committed long-term care personnel are more concerned about the wellbeing of the residents. Conversely, staff members' knowledge that they are providing high care quality may also increase their commitment to their organization [34].

As effective collaboration is crucial to quality of care across an organization, another important positive predictor of AOC in nursing homes was care personnel's sense of collaboration with their administrator, director of nursing, and colleagues. Likewise, breakdowns in communication and inter-professional interaction can lead to problems with patient care [36]. It could be shown that enhancing nursing supervisory communication skills had positive impacts not only on nurse aide performance and job satisfaction [37], but increased nurses' sense of closeness to their patients [38]. Effectively conveying an organization's goals and values, particularly to create an environment in which professional care can be provided, will likely also either directly or indirectly foster AOC. Moreover, a positive perception of collaboration with upper management, i.e., where care personnel perceive that their contribution is valued and that the organization cares about their welfare, might reflect organizational support [39]. Based on social exchange theory, organizational commitment is strongest in organizations that show commitment to their employees [40]. Chang [41] found that positive perceptions of organizational support correlated with a stronger positive relationship between job satisfaction and higher organizational commitment.

Similarly, positive collaboration with upper management might be enhanced by support and resources for personnel to provide high-quality care [41].

Not surprisingly, then, perceptions of staffing and resource adequacy are a significant predictor of AOC. As resource inadequacy leads to higher workload, Karsh and colleagues [5] not only linked it with lower AOC, but held it responsible for 9 % of variance in AOC in nursing homes. Greater autonomy, increased job control and social support correlate with lower reported work stress [42, 43]. Such findings indicate that to maintain AOC, it is necessary both to provide staffing and resources adequate for predictable workloads and, where workloads swell, to foster alternative forms of support to minimize the related stress.

However, in contrast with various studies supporting a positive relationship between AOC and autonomy [10, 11], the current study's data indicate no significant relationship between the two. In the SHURP study's sample, a third of the care personnel were nurse aids. The post-hoc analysis of the differences in autonomy between different professional groups revealed that autonomy decreased significantly with lower levels of education. Nurses develop and adapt care plans, whereas nursing assistants implement those care plans under the nurses' supervision. This variation between levels of professional autonomy might well have influenced our results.

7.5.3. Care personnel outcomes

AOC was a strong predictor for the intention to leave the job. This result is well-corroborated by studies in other healthcare settings [44, 45], and in two studies in the nursing home setting [4, 5]. Considering nursing homes' current difficulties recruiting and retaining care personnel, AOC is an important factor to consider. However, AOC is a slow-changing factor most effectively influenced by dealing with the predictors described above, e.g., competent, supportive leadership, job satisfaction, upper management support, manageable workloads, teamwork, and probably tailored interventions to enhance autonomy.

AOC also showed a significant negative relationship with care personnel's health complaints. Few studies have examined this relationship. Schalk [12] revealed in a longitudinal study that AOC was related to reported health complaints at the same point in time, but he could not show a consistent causal relationship. Researchers have argued that because AOC can serve as a resource to alleviate the effects of stress, it protects them from the risk of health problems and reduced wellbeing [17]. As AOC enhancing factors also mitigate the effects of work stressors, improved health status may be related to a combination of AOC and its stress-reducing antecedents.

To our knowledge, this is the first study in aged care to examine AOC's relationships with absenteeism and presenteeism. Our analyses revealed negative relationships with both variables. This supports Meyer and colleagues [13] in their finding of a slight negative correlation between AOC and involuntary absenteeism. According to Felfe and colleagues [17], absenteeism in care personnel is only partially explainable by their attitudes. The relationship between AOC and absenteeism is indirect and influenced via situational factors such as stressful working conditions, compulsory attendance and personal factors such as health or responsibility for children [17]. Absenteeism entails immediate and significant costs for the organization, and interventions to improve AOC might influence it.

In contrast, presenteeism occurs when an employee goes to work despite a medical illness that will prevent him or her from functioning fully. Increasing evidence suggests that the presence of ill or medically impaired care personnel results in significant costs via decreased productivity at the workplace [46, 47]. Employees of long-term care facilities typically demonstrate high rates of presenteeism [48]. Generally, work-related factors such as higher time pressure, job insecurity, and inadequate social support appear more reliable as its predictors than personal factors or attitudes [49]. However, in a qualitative study in hospital nurses, Krane and colleagues [14] showed that intrinsic motivation to work when sick had a stronger influence than social pressure. Since care personnel's AOC values are negatively

related to absenteeism, presenteeism, and stress, interventions to foster AOC may reduce not only illness-related issues, but stress-related illnesses as well.

Aggressive behavior by nursing home residents is endemic [50, 51]. In the present study, more than a fifth of care personnel experienced verbal aggression several times a week, a tenth physical aggression, and a fortieth sexual aggression. This is congruent with the findings of Zeller and colleagues [50] in Swiss nursing homes, which revealed that 38.2 % of care personnel had experienced verbally or physically aggressive behavior in the week prior to data collection. Care personnel characteristics serving as predictors for resident aggression include education level, staffing ratio, gender, age, confidence in managing aggression, and occupational strain [50, 52]. One apparently effective intervention to reduce patient aggression is the reduction of the caregiver workload [53]. Care personnel with fully manageable workloads can better concentrate on residents, which might lead to fewer aggressive episodes. Still, when aggression occurs, it requires coping strategies. Organizational or social support can help caregivers to deal with disagreeable situations. Both manageable workloads and social support are antecedents of AOC.

7.5.4. Strengths and limitations

The chief strength of this study is that, for the first time, it comprehensively investigated AOC in a representative national sample, allowing generalization of its results to all Swiss nursing homes with more than 20 beds. Also for the first time, this allowed the researchers to address several questions, including, for example, the importance of AOC regarding absenteeism and presenteeism in the nursing home sector. The participants' high response rate is another crucial strength.

One factor to consider when collecting data is to avoid systematic measuring errors, particularly common method variance (CMV) [54]. Correlations between items measured using the same method can be inflated, potentially biasing behavioral research [54]. Several approaches have been recommended to avoid or correct CMV [55]. For this study, the use of

diverse sources of information for key variables was not possible. However, certain procedural remedies could be applied while designing and administrating the questionnaire: to counteract the perceived pressure of the subjects to respond according to social desirability, for example, respondents' confidentiality were guaranteed. Regarding our analyses, the arrangement of the items within the constructs was carried out in an order that did not allow deduction of the dependent and independent variables. Furthermore, all constructs were clearly separated with respect to the content; and separate Likert-type scales were used.

A further limitation is the use of single items for some constructs (autonomy, quality of care, underuse of skills, job satisfaction, and collaboration). Although single item measurements might not capture appropriately the whole construct, we choose to limit questionnaire length in order to reduce response burden for personnel and financial burden for the nursing homes which provided the time necessary to fill out the questionnaire. The use of single items has been shown to be a valid measurement for job satisfaction [56, 57], and quality of care [58].

Another limitation was the cross-sectional study design, which does not provide conclusive evidence of causality. Also, in large samples, p-values commonly reach apparently significant levels without clinical relevance; however, the reported odds ratios provide an adequate basis to judge the results' clinical significance.

7.5.5. Further research

Future studies of AOC in nursing homes should integrate a broader range of variables. Many strong predictors of AOC in other settings, e.g., interpersonal justice, innovation, or positive diversity climates have yet to be examined in nursing homes. To allow causal inferences, longitudinal designs are also needed. Finally, the effectiveness of leadership training on AOC should be investigated in an intervention study.

7.6. Conclusions

Care personnel are nursing homes' most valuable resources. A better understanding of the factors that influence AOC is critically needed in today's nursing shortage environment. This study shows that leadership is the most important antecedent of AOC. Certain antecedents described in this study, e.g., collaboration, perceptions of staffing and resource adequacy, quality of care, and underuse of skill, have never before been investigated in nursing homes.

The study provides new support to previous research about the importance of nurses' commitment and satisfaction for organizational effectiveness and performance. The lack of committed staff who are willing to exert considerable effort to apply a resident-centered philosophy, could be especially harmful for long-term care, because resident relationships with staff are central to the provision of good-quality care. To maintain stable and healthy nursing home staff, these findings stress the importance of fostering AOC. The findings have practical implications for all nursing home administrators and managers who strive to improve AOC and increase care personnel retention. Because leadership and job satisfaction are the strongest predictors of AOC, leadership development interventions and interventions aimed at increasing job satisfaction promise having the greatest value in increasing levels of AOC. Leadership can be learned by formal training and education, by observation of others, and by trial and error. Interventions to increase job satisfaction can bolster care personnel's interpersonal skills, encourage group support, embolden participation in resident care planning and decision making, and elevate the overall quality of care.

7.7. References

1. Meyer, J. P. and Allen, N. J. (Eds). (1997). *Commitment in the workplace: Theory, research, and application*. Thousand Oaks, CA: Sage Publications.
2. Westphal, A. and Gmür, M. (2009). [Organizational commitment and its influencing factors: A qualitative meta-analysis]. *Journal für Betriebswirtschaft*, *59*(4), 201 - 229.
3. Mathieu, J. E. and Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological bulletin*, *108*(2), 171.
4. Ingersoll, G. L., Olsan, T., Drew-Cates, J., DeVinney, B. C. and Davies, J. (2002). Nurses' job satisfaction, organizational commitment, and career intent. *The Journal of Nursing Administration*, *32*(5), 250-63.
5. Karsh, B., Booske, B. and Sainfort, F. (2005). Job and organizational determinants of nursing home employee commitment, job satisfaction and intent to turnover. *Ergonomics*, *48*(10), 1260-1281.
6. Al-Hussami, M. (2009). Predictors of nurses`commitment to health care organizations. *The Australian Journal of Advanced Nursing*, *26*(4), 36-48.
7. Karantzas, G. C., Mellor, D., McCabe, M. P., Davison, T. E., Beaton, P. and Mrkic, D. (2012). Intentions to quit work among care staff working in the aged care sector. *The Gerontologist*, *52*(4), 506-516.
8. Rai, G. S. (2012). Organizational commitment among long-term care staff. *Administration in Social Work*, *36*(1), 53-66.
9. MacLeod, D. and Clarke, N. (2009). *Engaging for success: enhancing performance through employee engagement: a report to government*. London: BIS.
10. Rodwell, J., Noblet, A., Demir, D. and Steane, P. (2009). Supervisors are central to work characteristics affecting nurse outcomes. *Journal of Nursing Scholarship*, *41*(3), 310-319.
11. Steffen, T. M., Nystrom, P. C. and O'Connor, S. J. (1996). Satisfaction with nursing homes. The design of employees' jobs can ultimately influence family members' perspectives. *Journal of Health Care Marketing*, *16*(3), 34-8.
12. Schalk, R. (2011). The influence of organizational commitment and health on sickness absenteeism: A longitudinal study. *Journal of Nursing Management*, *19*(5), 596-600.
13. Meyer, J. P., Stanley, D. J., Herscovitch, L. and Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, *61*(1), 20-52.
14. Krane, L., Larsen, E., Nielsen, C., Stapelfeldt, C., Johnsen, R. and Risor, M. (2014). Attitudes towards sickness absence and sickness presenteeism in health and care sectors in Norway and Denmark: A qualitative study. *BMC Public Health*, *14*(1), 880.
15. Camerino, D., Estryn-Behar, M., Conway, P. M., van Der Heijden, B. I. J. M. and Hasselhorn, H.-M. (2008). Work-related factors and violence among nursing staff in the European NEXT study: A longitudinal cohort study. *International Journal of Nursing Studies*, *45*(1), 35-50.
16. Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and de Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

17. Felfe, J., Six, B., Schmook, R. and Knorz, C. (2010). Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem Commitment gegenüber der Organisation, dem Beruf / der Tätigkeit und der Beschäftigungsform (COBB). In Glöckner-Rist, A. (Eds.), *Zusammenstellung sozialwissenschaftlicher Items und Skalen ZIS Version 14.00*. Bonn: GESIS.
18. Lapane, K. L. and Hughes, C. M. (2007). Considering the employee point of view: Perceptions of job satisfaction and stress among nursing staff in nursing homes. *Journal of the American Medical Directors Association*, 8(1), 8-13.
19. Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R. and Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, 6, 44.
20. Lake, E. T. (2007). The nursing practice environment: Measurement and evidence. *Medical Care Research and Review*, 64(2 Suppl), 104S-22S.
21. Bundesamt für Statistik BFS (2007) *[The Swiss health survey in brief 2007 - concept, method, implementation]*. Retrieved from www.bfs.admin.ch/bfs/portal/de/index/.../03.Document.122331.pdf
22. Cammann, C., Fichman, M., Jenkins, D. and Klesh, J. (1979). The Michigan Organizational Assessment Questionnaire. In Seashore, S. E., Lawler, E. E., Mirvis, P. H. and Cammann, C. (Eds.), *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71–138). New York: Wiley-Interscience.
23. Mobley, W., Horner, S. O. and Hollingsworth, A. T. (1978). An evaluation of the precursors of hospital employee turnover. *Journal of Applied Psychology*, 62(4), 237-240.
24. Ryden, M. B., Bossenmaier, M. and McLachlan, C. (1991). Aggressive behavior in cognitively impaired nursing home residents. *Research in Nursing & Health*, 14(2), 87-95.
25. Sermeus, W., Aiken, L. H., Van den Heede, K., Rafferty, A. M., Griffiths, P., Moreno-Casbas, M. T., Busse, R., Lindqvist, R., Scott, A. P., Bruyneel, L., Brzostek, T., Kinnunen, J., Schubert, M., Schoonhoven, L. and Zikos, D. (2011). Nurse forecasting in Europe (RN4CAST): Rationale, design and methodology. *BMC Nursing*, 10, 6.
26. Field, A. (2009). *Discovering statistics using SPSS*. London: Sage.
27. Lee, M., Choi, J. S., Lim, J. and Kim, Y. S. (2012). Relationship between staff-reported culture change and occupancy rate and organizational commitment among nursing homes in South Korea. *The Gerontologist*, 53(2), 235-45.
28. Tuckett, A., Parker, D., Eley, R. M. and Hegney, D. (2009). 'I love nursing, but..'- qualitative findings from Australian aged-care nurses about their intrinsic, extrinsic and social work values. *International Journal of Older People Nursing*, 4(4), 307-17.
29. DeGroot, T., Kiker, D. S. and Cross, T. C. (2000). A meta-analysis to review organizational outcomes related to charismatic leadership. *Canadian Journal of Administrative Sciences*, 17(4), 356-372.
30. Mosadeghrad, A. M. and Ferdosi, M. (2013). Leadership, job satisfaction and organizational commitment in healthcare sector: Proposing and testing a model. *Materis Sociomedica*, 25(2), 121-126.
31. Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European Journal of Work and Organizational Psychology*, 8(1), 9-32.
32. Yoon, J. and Thye, S. R. (2002). A dual process model of organizational commitment: Job satisfaction and organizational support. *Work and Occupations*, 29(1), 97-124.
33. Modway, R., Porter, L. and Steers, R. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior*, 14(2), 224-247.

34. Castle, N. G., Degenholtz, H. and Rosen, J. (2006). Determinants of staff job satisfaction of caregivers in two nursing homes in Pennsylvania. *BMC Health Services Research*, *6*, 60.
35. Moyle, W., Skinner, J., Rowe, G. and Gork, C. (2003). Views of job satisfaction and dissatisfaction in Australian long-term care. *Journal of Clinical Nursing*, *12*(2), 168-76.
36. Zwarenstein, M., Goldman, J. and Reeves, S. (2009). Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, (3), CD000072.
37. McGilton, K. S., Hall, L. M., Wodchis, W. P. and Petroz, U. (2007). Supervisory support, job stress, and job satisfaction among long-term care nursing staff. *Journal of Nursing Administration*, *37*(7-8), 366-72.
38. McGilton, K. S., Irwin-Robinson, H., Boscart, V. and Spanjevic, L. (2006). Communication enhancement: Nurse and patient satisfaction outcomes in a complex continuing care facility. *Journal of Advanced Nursing*, *54*(1), 35-44.
39. Rhoades, L. and Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology*, *87*(4), 698-714.
40. Eisenberger, R., Fasolo, P. and Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology*, *75*(1), 51-59.
41. Chang, C. S. (2014). Moderating effects of nurses' organizational support on the relationship between job satisfaction and organizational commitment. *Western Journal of Nursing Research*, Advance online publication.
42. Schmidt, K.-H. and Diestel, S. (2011). Differential effects of decision latitude and control on the job demands-strain relationship: A cross-sectional survey study among elderly care nursing staff. *International Journal of Nursing Studies*, *48*(3), 307-317.
43. Fisher, D. M. (2014). A multilevel cross-cultural examination of role overload and organizational commitment: Investigating the interactive effects of context. *Journal of Applied Psychology*, *99*(4), 723-36.
44. Chang, P. L., Chou, Y. C. and Cheng, F. C. (2007). Career needs, career development programmes, organizational commitment and turnover intention of nurses in Taiwan. *Journal of Nursing Management*, *15*(8), 801-10.
45. Cowden, T. L. and Cummings, G. G. (2014). Testing a theoretical model of clinical nurses' intent to stay. *Health Care Management Review*, Advance online publication.
46. Brooks, A., Hagen, S. E., Sathyanarayanan, S., Schultz, A. B. and Edington, D. W. (2010). Presenteeism: Critical issues. *Journal of Occupational and Environmental Medicine*, *52*(11), 1055-67.
47. Schultz, A. B., Chen, C. Y. and Edington, D. W. (2009). The cost and impact of health conditions on presenteeism to employers: A review of the literature. *PharmacoEconomics*, *27*(5), 365-78.
48. Aronsson, G., Gustafsson, K. and Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health*, *54*(7), 502-509.
49. Hansen, C. D. and Andersen, J. H. (2008). Going ill to work – What personal circumstances, attitudes and work-related factors are associated with sickness presenteeism? *Social Science and Medicine*, *67*(6), 956-964.
50. Zeller, A., Dassen, T., Kok, G., Needham, I. and Halfens, R. J. (2012). Factors associated with resident aggression toward caregivers in nursing homes. *Journal of Nursing Scholarship*, *44*(3), 249-57.

51. Franz, S., Zeh, A., Schablon, A., Kuhnert, S. and Nienhaus, A. (2010). Aggression and violence against health care workers in Germany - a cross sectional retrospective survey. *BMC Health Services Research*, *10*(1), 51.
52. Gates, D., Fitzwater, E. and Succop, P. (2003). Relationships of stressors, strain, and anger to caregiver assaults. *Issues in Mental Health Nursing*, *24*(8), 775-793.
53. Isaksson, U., Astrom, S., Sandman, P. O. and Karlsson, S. (2009). Factors associated with the prevalence of violent behaviour among residents living in nursing homes. *Journal of Clincal Nursing*, *18*(7), 972-80.
54. Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903.
55. Chang, S.-J., van Witteloostuijn, A. and Eden, L. (2010). From the Editors: Common method variance in international business research. *Journal of International Business Studies*, *41*(2), 178-184.
56. Wanous, J. P., Reichers, A. E. and Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology*, *82*(2), 247-52.
57. Dolbier, C. L., Webster, J. A., McCalister, K. T., Mallon, M. W. and Steinhardt, M. A. (2005). Reliability and validity of a single-item measure of job satisfaction. *American Journal of Health Promotion*, *19*(3), 194-8.
58. McHugh, M. D. and Stimpfel, A. W. (2012). Nurse reported quality of care: A measure of hospital quality. *Research in Nursing & Health*, *35*(6), 566-75.

CHAPTER 8

THE MEDIATING EFFECT OF JOB SATISFACTION AND AFFECTIVE ORGANIZATIONAL COMMITMENT ON THE RELATIONSHIP OF WORK ENVIRONMENT FACTORS WITH EMPLOYEE REFERRAL. FINDINGS FROM THE CROSS-SECTIONAL SWISS NURSING HOMES HUMAN RESOURCES PROJECT (SHURP)

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8.1. Summary

Although employee referrals are promising ways to attract new employees in times of shortage of qualified care workers in health care, little is known about organizational factors related to employee referral. The objective of this study was to (1) describe the prevalence of employee referral in nursing homes, and (2) to explore the relationship of work environment and quality of care with employee referral and the mediating effect of job satisfaction and affective organizational commitment. Data for this study were collected in a questionnaire survey of care workers in a randomly selected sample of 155 Swiss nursing homes participating in the cross-sectional Swiss Nursing Homes Human Resources Project (SHURP). We found that 86% of care workers would refer their nursing home to colleagues as a good working place. Higher affective organizational commitment and job satisfaction were significantly related to employee referral and partially mediated the relationship of leadership and quality of care with employee referral. Accordingly, organizations with better work environments also gain from more employee referrals.

8.2. Introduction

The lack of qualified care workers is high on the agenda in nursing homes. The competition for skilled care staff in long-term care is tough, and especially in nursing homes it is difficult to find enough registered nurses [1, 2]. Attracting and retaining staff, thus, becomes an important priority for nursing home directors. Less attractive nursing homes will have difficulties to fill available positions [3-5] and might be forced to dilute the workforce with less skilled care staff [6], which can have a negative impact on resident outcomes [7]. In various industries, the employer's image and reputation is important in recruitment success, which is partly related to favorable work environments such as positive leadership, teamwork, and pace of work [8]. An organization's positive image enhances its attractiveness, as current employees are more likely to recommend their workplace to potential hires when they experience a favorable work environment [9, 10]. In spite of the priority given to attracting nursing staff in long-term care, few studies have examined the relationship between the work environment and employee referrals in health care in general and in nursing homes in particular.

8.2.1. Theoretical background

Healthcare organizations have a public as well as internal image and have the possibility to actively shape this image, which is referred to as branding. A brand marks the distinct identity of an organization that sets it apart from competitors [11]. To be credible, it needs to be consistent with the realities of an organization [8]. The literature distinguishes between (1) consumer branding, the active shaping of an organization's image for consumers, and (2) employer branding, the process of building an identifiable and unique employer identity [12, 13]. Employer brand is defined as "the package of functional, economic and psychological benefits provided by employment, and identified with the employing company" [14]. Among those functional benefits are the activities that can be performed when employed such as being able to serve or help people; economic benefits such as extra payment or additional

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holidays; and psychological benefits such as to belong, have a direction and purpose [14]. Employer brand is strongly related to the products or services offered, the organizational successes, the company's external image as perceived by employees, and different aspects of the employment, such as leadership, work environment, and attributes of the workforce [8, 14]. Strengthening and communicating the unique characteristics of an organization in all these areas helps to build a positive employer brand. This not only attracts potential employees but also helps current employees to identify with their organization [8, 12, 15, 16]. Based on social identity theory it can be postulated that employees' positive perception of their organization's employer brand strengthens their identification with the organization [12]. If a company's brand message does not portray accurately the lived reality such as a positive work environment or a high quality product, employees have reduced job satisfaction and higher intentions to quit [12]. However, a positive employer brand fosters organizational commitment, heightens productivity, and lets employees talk positively about their organization and recommend it as a good working place [12, 17, 18].

Employee referrals are word-of-mouth recommendations of employees to outside persons concerning the organizations they work for. While word-of-mouth recommendations are interpersonal communications about an organization in general, the source of which might be current as well as former employees and other persons related to the organization, employee referrals are very specific recommendations of current employees [19]. Employees are important ambassadors of an organization's image. Their behavior and word-of-mouth referral will shape the organization's image to the outside world and attract or keep away potential employees [19]. Although studies have examined how to build and improve one's employer brand by improving the work environment and what the effects are of word-of-mouth recommendations, little is known about work environment factors related to employees' referral of their organization to potential employees, especially in the healthcare sector. The purpose of this study is, therefore, to examine the relationship of work

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environment factors with employees' referral of their workplace to potential colleagues, taking into account the effect of care workers' job satisfaction and affective organizational commitment as mediating the relationship between work environment and employee referral.

8.2.2. Employee referral of their workplace

Employee referrals play a key role in the recruitment success in all branches of work [9, 17]. In a US survey of job seekers in different branches of trade, 70% used referrals from current employees of an organization [20]. From an employer perspective, 9% of individuals successfully recruited in German healthcare organizations, mostly acute care, came from employee referrals. These healthcare organizations give employee referrals high priority in their recruiting strategies, since other strategies such as job advertisements or job agencies are no longer sufficient to find qualified personnel [21]. Employee referrals have a strong impact on the attractiveness of an employer to a perspective employee, regardless of the branch of work [9]. Potential employees consider employee recommendations more credible and trustworthy than the official communications of an organization [9, 22]. Employees recruited with employee referrals seem to have higher organizational commitment and job satisfaction [23], longer tenure, and better performance [24, 25] than employees recruited with advertisements or via employment agencies. These positive outcomes might be based on more accurate and realistic pre-hire information being shared by word-of-mouth, and better person-job and person-organization fit [24].

Employee referral is an organization-independent recruitment source, in the sense that organizations can not directly influence what employees say about them [26], although they can give incentives for word-of-mouth referrals. However, organizations have control about antecedents of referral [18] and can influence these. According to the literature, important antecedents for employee referral are job satisfaction and affective organizational commitment [27-29], employees' perception of their work environment [18, 30] and the quality of service provided [18]. They are presented in the following conceptual model.

8.2.3. Conceptual model of this study

Different models exist to describe antecedents of employee referral. One model focusses motivators for employee referral. Shinnar and colleagues [31] group antecedents into those based on extrinsic motivation, such as organizational climate or culture or encouragement with material rewards, or on intrinsic motivation, when employees are satisfied with their job or strongly identify with their institution [31, 32]. Van Hoye [18] based her research of employee referral on the instrumental-symbolic framework. She postulated that employee referral depends on the instrumental and symbolic images the employees have of their organization. The instrumental image includes "objective, concrete and factual attributes that an organization either has or does not have" [18] such as teamwork, advancement opportunities or service quality. The symbolic image refers to "subjective, abstract and intangible traits" [18] such as an organization's competence, innovativeness, or prestige. This model does not include employee characteristics or intrinsic motivators such as job satisfaction or organizational commitment and Van Hoye [18] recommended that these be included in future research about antecedents of employee referral. For this study we, thus, examined the relationship of the instrumental image of the organization, specifically the perception of the work environment and quality of care, with the referral of one's nursing home as a working place (cf. Figure 1). In addition, we extended previous research by examining intrinsic motivators, job satisfaction and affective organizational commitment, as mediating the relationship between the instrumental image and employee referral.
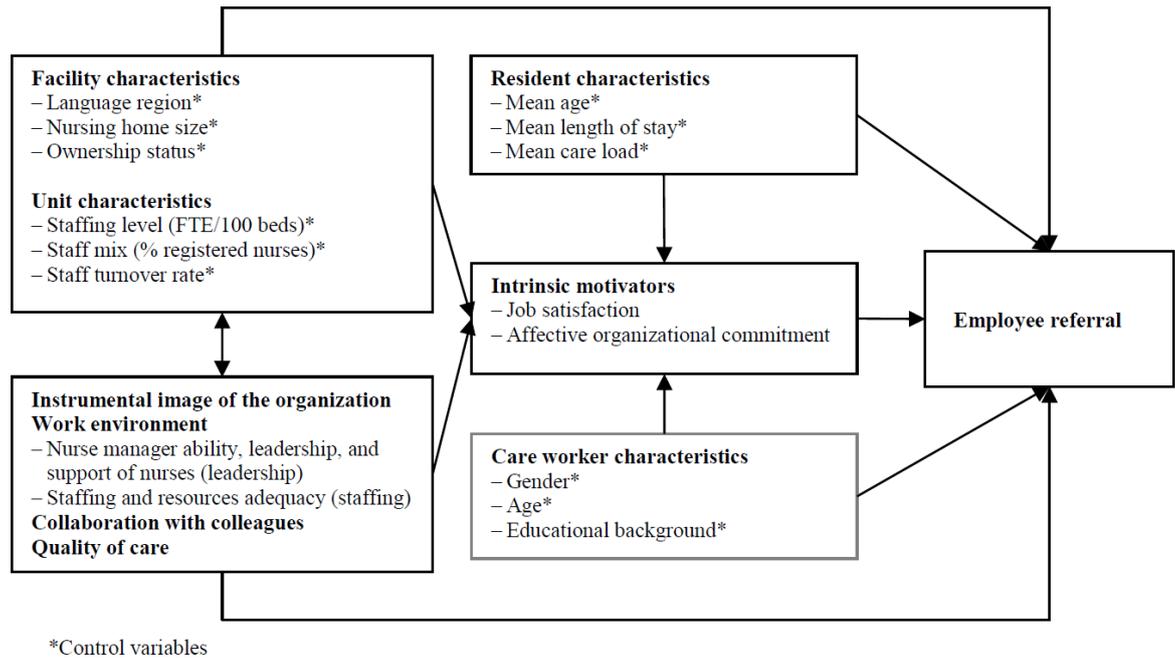
Figure 1: *Factors related to employees' referral of their nursing home to potential employees*

8.2.4. Literature review on selected antecedents of employee referral

Based on the literature, the relationship of work environment factors, service quality, job satisfaction, and affective organizational commitment with employee referral has been established for different branches of work, although evidence in the health care setting and especially nursing homes is still scarce.

Only one previous study examining the association between work environment factors and employee referral in nursing homes was identified. It reported that employee referral was higher when the nursing home offered task diversity [18]; no other work environment factors were examined. However, several work environment aspects have been shown to be important in attracting and retaining nurses in long-term care, among them supportive leadership and staffing adequacy [33]. Low staffing and heavy workload are known to negatively impact healthcare institutions' attractiveness, probably because they undermine the possibility to provide an adequate quality of care and build relationships with residents [10]. In a review of studies of different branches of industry in German-speaking countries [30], the

most important characteristic of attractive employers was the organizational climate, work atmosphere, and team.

The relationship between the quality of care provided and employee referral has not been widely examined. However, in consumer research, the quality of service offered is an important factor in whether customers recommend a product [34]. In the nursing home setting, registered nurses are more likely to remain with an employer if they are able to enjoy providing care to older people, to develop relationships with them and to make a difference in their quality of life [33]. Correspondingly, it can be expected that the ability to offer good quality of care will heighten organizational citizenship behavior, with employees recommending the nursing home as workplace for others to benefit the organization. According to Van Hoye [18], employees in nursing homes were more willing to recommend their employer to others when they perceived they were able to help people.

Affective organizational commitment has been repeatedly found to be related to employee referral [27, 28]. Employees who feel emotionally attached to their organizations are more likely to show organizational citizenship behavior through efforts to benefit their organization [28]. Another intrinsic motivator related to word-of-mouth referral is job satisfaction [29]. This might be based on the wish to share the benefits of being part of the organization with others [31].

Little is known about the mediating effect of job satisfaction and affective organizational commitment on the relationship between work environment and service quality and employee referral. Work environment factors are known predictors of job satisfaction and organizational commitment [35-41], and both job satisfaction and organizational commitment are known antecedents to employee referral. Accordingly, job satisfaction and affective organizational commitment might partially or fully mediate the relationship between work environment and employee referral. Although it might also be postulated that the work environment mediates the relationship between job satisfaction and organizational

commitment and employee referral, this is less likely from a theoretical perspective. It is expected that the work design or work environment gives rise to psychological states such as employee job satisfaction and organizational commitment and not the other way round [42].

Van Hoye [18] recommended including more organizational and individual characteristics in future research on antecedents of employees' referrals. So far, nothing is known about the relationship of both facility and unit characteristics such as the size or ownership status of the nursing home or the actual staffing level, turnover, and skill mix on the unit level, to employee referral. For example, care workers from units with high turnover might be less open to recommend their working place. Additionally, care workers in nursing homes have a heterogeneous educational background, such as registered nurses, licensed practical nurses and nurse aides, which might impact the outcome. Although these variables are not of primary interest in this study, facility, unit, and individual characteristics will be included as control variables in the model.

8.2.5. Study aims and hypothesis

The aims of this study are (1) to describe the prevalence of care workers' referral of their nursing home to potential employees, and (2) to explore the relationship of work environment and quality of care and employee referral and the mediating effect of job satisfaction and affective organizational commitment on that relationship. We hypothesized that job satisfaction and affective organizational commitment partially or fully mediate the relationship between work environment factors and employee referral.

8.3. Methods

8.3.1. Design and sample

This is a secondary data analysis of data collected in the Swiss Nursing Home Human Resources Project (SHURP), a cross-sectional study in a nationally representative sample of 163 Swiss nursing homes. Switzerland has more than 1550 nursing homes with around

91'000 older persons in need of care due to disabilities, cognitive decline, or functional limitations [43]. Nursing homes have a median size of 59 beds and offer work for approximately 120'000 persons [43]. They offer a variety of services, among them long-term care, day and night care centers, geriatric rehabilitation, or palliative care [43, 44] with residents staying for a mean of 3 years [43]. This sample included only nursing homes licensed by Swiss cantonal authorities with at least 20 beds and was stratified according to language region (German-, French-, and Italian-speaking parts of Switzerland) and nursing home size (small: 20-49 beds, medium: 50-99 beds, large: 100 and more beds). Hospice facilities and residential homes were excluded. At the care worker level, all care workers involved in direct resident care who had worked at least 8 hours per week for at least one month on their assigned unit were included. For this analysis, all care workers from nursing homes and units were included if full data on the facility and unit characteristics were provided by the administrators. Since the quality of leadership was a variable under consideration, respondents with leadership positions were excluded. The sampling, data collection and data management of SHURP are described elsewhere in more detail [45].

8.3.2. Variables and measurement

Employee referral was assessed with a single question: "Would you recommend your nursing home to a colleague as a good working place?" The question was answered on a 4-point Likert scale from 1="certainly not" to 4="yes, of course". Due to a left skewness in responses, the item was dichotomized into positive ("probably yes", "yes of course") and negative answers ("certainly not", "probably not") for the analyses. Variables measuring facility and unit characteristics, work environment, quality of care, intrinsic motivators, and care worker characteristics are described in detail in Table 1.

Table 1: *Description of explanatory variables used in study*

Variable Name	Description and Psychometrics	Measurement
Facility characteristics		
Language region	Nursing homes from German-, French-, or Italian-speaking part of Switzerland	3 categories
Nursing home size	Categorization in 3 sizes: Small: 20-49 beds, medium: 50-99 beds, large: 100 and more beds	3 categories
Ownership status	Categorization into public institutions, private or private-subsidized ones. The latter are under private law with a guarantee from some authority (mostly municipal) that either part of their operating costs, some investments, or their deficit are subsidized	3 categories
Unit characteristics		
Staffing level	Number of full-time equivalent (FTE) positions on unit: recalculated as FTE / 100 beds for comparability	Number
Staff mix (% registered nurses)	Percentage of FTE occupied by registered nurses per unit	Percentage
Staff turnover rate (%)	Number of care workers (all educational backgrounds) who left the unit in the last 6 months divided by the number of care workers present at the time of data collection	Percentage
Resident characteristics		
Resident mean age	Age at date of survey	Mean age per unit
Resident mean length of stay	Number of days residents stayed on unit from day of admission to day of survey	Mean number of days per unit
Resident mean care load	Care time needed by residents, categorized in 12 groups according to national reimbursement system: each resident is allocated to one of 12 groups where each higher group represents an additional 20 minutes in care time per day	Reimbursement group mean over all residents on unit
Instrumental image of the organization		
Practice Environment Scale- Nurse Working Index (PES-NWI)		
Leadership	5-item subscale *"Nurse manager ability, leadership, and support of care workers"* of the PES-NWI [46] with items such as "a supervisory staff that is supportive of the care workers", "a unit manager who is a competent leader", or "praise and recognition for a job well done" Cronbach's α=.84*.	4-point Likert scale from 1=strongly disagree to 4=strongly agree Scale: mean over all items
Staffing and resources adequacy	3-item subscale *"Staffing and resources adequacy"* of the PES-NWI [46] with items such as "enough staff to get the work done" or "enough time and opportunity to discuss resident care problems with other care workers" Cronbach's α=.74*	4-point Likert scale from 1=strongly disagree to 4=strongly agree Scale: mean over all items
Collaboration		
Collaboration with colleagues	A single item from the Safety Attitudes Questionnaire (SAQ) [47] was used to assess care workers' rating of the quality of collaboration with colleagues on their unit	4-point Likert scale from 1=very low to 4=very high with the option "don't know" dichotomized for analysis in very/rather low vs. rather/very high
Quality of Care		
Quality of care	Single item asking care workers to rate the overall quality of care on their unit. Assessment of quality of care with a single item has been shown to be a valid measurement in hospitals [48]	4-point Likert scale from 0=very low to 3=very high, dichotomized for analysis in very/rather low vs. rather/very high

Variable Name	Description and Psychometrics	Measurement
Intrinsic motivators		
Job satisfaction	Single item assessing overall job satisfaction. Assessment of job satisfaction with a single item has been shown to be valid in previous studies [49, 50]	4-point Likert scale from 1=very dissatisfied to 4=very satisfied
Affective organizational commitment	5-item scale from the German Questionnaire for the Assessment of Affective, Continuant, and Normative Commitment towards the Organization, Profession / Activity and Employment (COBB) [51] Cronbach's α=.87*	5-point Likert scale from 1=strongly disagree to 5=strongly agree Scale: mean over all items
Care worker characteristics		
Gender	Male / female	2 categories
Age	Measured in years	years
Educational background	Grouped into: - Registered nurses (diploma, bachelor or higher with 3-4 year education excluding graduate education after diploma or bachelor) - Licensed practical nurses (2-3 year education) - Certified nurse aides (1-2 year education) - Nurse aides (training on the job or short course) - Other	5 categories

* in this sample

8.3.3. Data collection and management

The survey was conducted between May 2012 and April 2013 in the three language regions of German-, French-, and Italian-speaking Switzerland. The nursing home administrators were asked for written informed consent prior to participation in the study. Together with the questionnaire, care workers received information about the study and a pre-stamped envelope to return the questionnaire individually. Sending it back to the data management center was considered informed consent. The study was approved by the leading ethics committee of the canton of Beider Basel (Ref.Nr. EK: 02/12) and all other Swiss cantonal ethics committees.

8.3.4. Data Analysis

For descriptive analysis, frequencies, percentages, mean and standard deviations were calculated as appropriate. To assess the relationships between work environment, quality of care, and intrinsic motivators and employee referral, multilevel logistic regression models were used. Based on the calculation of the intraclass correlation 1 (ICC1) for employee referral in a multilevel null model (care workers nested within units and facilities) with

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Stata/IC 13.1, the answers of care workers depended on unit and facility membership (units within facilities ICC1: 0.278, facility ICC1: 0.190). Moreover, the outcome variable showed significant differences at the unit as well as facility level, which made a three-level analysis necessary to account for the clustering of the data (level 1: care workers, level 2: unit, level 3: facility). The mediating effects of job satisfaction and affective organizational commitment were tested according to the procedure of Baron and Kenny [52], establishing the following four conditions: (1) the independent variables (work environment and quality of care) are related to the dependent variable (employee referral), (2) the independent variables (work environment and quality of care) are related to the mediating variables (job satisfaction and affective organizational commitment), (3) the mediating variables are related to the dependent variable (employee referral), and (4) adding the mediating variables to the basic model will reduce or eliminate the association between work environment, quality of care and employee referral. A series of logistic regression models were built, introducing first work environment factors and quality of care to establish condition 1 (model 1), then only intrinsic motivators to establish condition 3 (model 2) and in a final model all variables together to test condition 4 (model 3). As for condition 2, the relationship of work environment and quality of care with affective organizational commitment has been shown elsewhere [53]. Their relationship with job satisfaction will be reported in a future paper (Schwendimann et al. forthcoming). A sensitivity analysis was performed with the same procedure with the dependent variable (employee referral) dichotomized into only highly likely ("yes of course") vs. all other answer options. Multicollinearity was tested with the variance inflation factor (VIF); all values were <1 [54]. The models were adjusted for facility, unit, resident, and care worker characteristics. Missing values were not replaced. A p-value of <.05 was considered significant. Data analyses were performed with Stata/IC 13.1.

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8.4. Results

A total of 4311 care workers from 155 nursing home facilities were included in the model. Twenty-five percent (25%) of the care workers were registered nurses, 92% were female and their mean age was 43 years (Table 2). Most respondents (86%) reported that they would recommend their workplace (ranging between 85% and 89% for different educational backgrounds). The range on the facility level was between 42% and 100% of care workers. In 40 facilities less than 80% of care workers would refer their nursing home and in 10 facilities less than 60% would do so, while in 32 facilities 100% of care workers would refer their workplace. When looking at high likelihood to refer (answer option "yes of course"), 44% of care workers would recommend their working place and there were only 10 facilities where 80% or more care workers would recommend their nursing home and 124 facilities where less than 60% would do so. Overall job satisfaction was high with mean rating of 3.2, which corresponds to an answer between rather and very satisfied, and the affective organizational commitment was 3.8, which is close to rather agree. Leadership was rated positively with a mean of 3.1 (3="rather agree"), while staffing and resource adequacy had a mean of 2.8 (3="rather agree"). Few respondents (7%) rated quality of care as low.

Table 2: *Characteristics of variables under study*

	%	Mean	SD	Missing n (%)
Facility characteristics (n=155 facilities)				
Language region				0 (0)
German-speaking part	75.5			
French-speaking part	18.7			
Italian-speaking part	5.8			
Nursing home size				0 (0)
Small (20-49 beds)	38.1			
Medium (50-99 beds)	47.7			
Large (100 and more beds)	14.2			
Ownership status				0 (0)
Public	37.4			
Private subsidized	26.5			
Private	36.1			

	%	Mean	SD	Missing n (%)
Unit characteristics (n=402 units)				
Staffing level (FTE/100 beds)		51.7	15.3	0 (0)
Staff mix (% registered nurses)		31.7	11.9	0 (0)
Staff turnover rate (%)		11.8	15.6	0 (0)
Nursing home resident characteristics (per unit, n=402 units)				
Mean age (years)		84.6	3.0	0 (0)
Mean length of stay (days)		1237.2	434.5	0 (0)
Mean care load (scale from 1-12)		5.9	1.6	0 (0)
Care worker characteristics (n=4311 respondents)				
Gender (female)	92.3			50 (1.2)
Age (years)		43.4	12.2	132 (3.1)
Educational background				50 (1.2)
Registered nurse or higher (3-4 years of education)	25.3			
Licensed practical nurse (2-3 years of education)	21.5			
Certified assistant nurse (1-2 years of education)	19.9			
Nurse aide (training on the job or short course)	30.0			
Other	3.3			
Work environment (scale range / answer options)				
PES-NWI: Leadership (1-4)		3.1	0.6	1 (0.0)
PES-NWI: Staffing and resources adequacy (1-4)		2.8	0.7	8 (0.2)
Collaboration with colleagues (rather/very high)	96.0			58 (1.3)
Overall quality of care (rather/very high)	93.3			25 (0.6)
Intrinsic motivators (scale range)				
Job satisfaction (1-4)		3.2	0.7	29 (0.7)
Affective organizational commitment (1-5)		3.8	0.8	8 (0.2)
Employee referral (answer options)				
Recommendation of working place (probably yes / yes of course)	86.4			33 (0.8)

Notes: FTE: full-time equivalent; PES-NWI: Practice Environment Scale-Nursing Work Index; underlined scores are preferable scores.

As for condition 1 in the testing procedure for a mediating effect, all work environment factors and quality of care (independent variables) were significantly related to the dependent variable, employee referral (cf. Table 3, model 1). For condition 2, the analysis of the relationship between work environment and quality of care with the mediating variable affective organizational commitment confirmed previous findings that all relationships were significant [53]. In the same way, all work environment variables and quality of care were significantly positively related to job satisfaction (results not shown). The fulfillment of condition 3 is shown in model 2: both mediating variables job satisfaction and affective organizational commitment were significantly related to employee referral on their own (affective organizational commitment: OR 10.7, CI95%: 8.3-13.6; job satisfaction: OR 4.7, CI95%: 3.8-6.0). The mediating effect of job satisfaction and affective organizational

commitment is shown in model 3: When all variables were combined, higher affective organizational commitment (OR 6.2, CI 95%: 4.8-8.1) and job satisfaction (OR 4.1, CI 95%: 3.2-5.3) had the highest significant relationship with employee referral, followed by better perception of leadership (OR 3.2, CI 95%: 2.3-4.3) and overall quality of care (OR 2.6, CI 95%: 1.7-4.0) (model 3). As seen in model 3 when compared to model 1, the addition of job satisfaction and affective organizational commitment to the work environment and quality of care variables fully mediated the association of staffing and collaboration with colleagues with employee referral, the relationship of both becoming insignificant. The relationship of leadership and quality of care with employee referral was partially mediated by both job satisfaction and affective organizational commitment and their odds ratios were reduced by half or more. Our hypothesis that job satisfaction and affective organizational commitment partially or fully mediate the relationship of work environment factors with employee referral was, thus, confirmed.

The sensitivity analyses showed similar results: in model 1, leadership, staffing and quality of care were significantly related to employee referral while collaboration with colleagues was not. Both job satisfaction and affective organizational commitment had a significant association with employee referral in model 2 and continued to have it in model 3 (affective organizational commitment OR 6.6, CI95%: 5.5-7.9, job satisfaction OR 2.9, CI95% 2.5-3.4), followed by leadership (OR 2.6, CI95% 2.0-3.2) and – unlike the results in Table 3 – staffing (OR 1.9, CI95% 1.6-2.2), whereas quality of care and collaboration with colleagues were not significant.

In the adjusted models, none of the control variables were significantly related to employee referral. Neither facility characteristics (language region, ownership status, size), nor unit characteristics (FTE/100 beds, staff mix, turnover), nor care worker characteristics (gender, age, educational background) were associated with the outcome.

Table 3: *Mediating effect of intrinsic motivators on the relationship of work environment and quality of care with employee referral*

	Recommendation of working place* (n=4050)								
	Model 1			Model 2			Model 3		
	Odds ratio	95%CI	p-value	Odds ratio	95%CI	p-value	Odds ratio	95%CI	p-value
Work environment & Quality of care									
- Leadership (PES-NWI)	**8.63**	**6.64 - 11.23**	**<0.01**				3.16	2.34 - 4.28	<0.01
- Staffing and resources adequacy (PES-NWI)	**2.11**	**1.68 - 2.65**	**<0.01**				1.28	0.98 - 1.67	0.07
- Collaboration with colleagues (Reference: rather /very low)	**2.16**	**1.37 - 3.42**	**<0.01**				1.15	0.67 - 1.97	0.61
- Overall quality of care (Reference: rather/very low)	**5.03**	**3.46 - 7.31**	**<0.01**				2.59	1.70 - 3.96	<0.01
Intrinsic motivators									
- Job satisfaction				4.77	3.79 - 6.01	<0.01	4.10	3.20 - 5.26	<0.01
- Affective organizational commitment				10.66	8.35 - 13.62	<0.01	6.19	4.76 - 8.06	<0.01
Random-effects Parameters									
- Facility level variance (95%CI)	0.41	(0.21 - 0.78)		0.38	(0.19 - 0.75)		0.27	(0.11 - 0.65)	
- Unit level variance (95%CI)	0.07	(0.00 - 2.36)		0.00	.	.	0.00	.	.
AIC	2019.85			1620.32			1515.28		

Notes: CI: Confidence interval; PES-NWI: Practice Environment Scale – Nurse Working Index; AIC: Akaike's information criterion.
*The models were adjusted for the following variables: Facility: language region, ownership status, size; Unit characteristics: Staffing level (FTE/100 beds), Staff mix (% registered nurses), staff turnover rate; Resident characteristics: Mean age, mean length of stay, mean care load per unit; Care worker characteristics: gender, age, educational background. None of the control variables was a significant predictor in the models, except for language region in model 1.

8.5. Discussion

This study examined the relationship between work environment, quality of care and employees' intrinsic motivators and employee referral. A high 86% of care workers would refer their nursing home to potential colleagues. Affective organizational commitment and job satisfaction had the highest significant relationship with employee referral followed by a supportive leadership and the possibility to provide a good quality of care. The study confirms the importance of work environment factors in addition to job satisfaction and affective organizational commitment in their relationship with employee referral, especially the important role of leadership.

The most important factors related to employee referral were affective organizational commitment and job satisfaction. This is in agreement with the literature from other branches of work (e.g. manufacturing companies, financial services) [27-29] and can now be confirmed for the nursing home sector. From a theoretical perspective, employee referral can be understood as an organizational citizenship behavior [28], i.e. a behavior promoting the effective functioning of the nursing home that goes beyond expectation or care workers' job description [55]. According to a literature review by Podsakoff and colleagues [55], one aspect of organizational citizenship behavior is organizational loyalty, which includes promoting the organization to and defending it from outsiders. Committed employees show their loyalty by speaking positively about their organization. Both organizational commitment and job satisfaction are broadly established predictors for organizational citizenship behavior [55] and might therefore be expected to be related to employee referral as well.

Supportive leadership is a critical part of the internal image of a nursing home that has been shown in this study to be related to employee referral. Although it is partially mediated by job satisfaction and affective organizational commitment, it shows an independent relationship with employee referral. The association of collaboration with colleagues with

employee referral, on the other hand, is fully mediated by job satisfaction and affective organizational commitment. Based on the sensitivity analysis, the results for staffing and resources adequacy and quality of care are mixed, being either partially or fully mediated depending on whether in the dependent variable care workers fully endorse their referral ("yes of course") or whether a partial endorsement is taken into account ("yes of course" and "probably yes" as answer options). The importance of leadership, staffing resources and quality of care is confirmed by former studies where the instrumental image of an organization [18], including being able to help people, and its employer brand [56] were positively related to employees' referral. Employees' images of their organization are formed by the work environment in which they work, their perception of leadership and by the quality of the service provided [8]. The results of this study show the importance of a positive instrumental image for employee referral and are in line with international findings. Being able to provide high quality of care is a major attraction factor for nursing graduates selecting a future employer [57], which proved to be an important factor in magnet hospital research. Magnet® hospitals are able to attract and retain nurses because they offer a work environment that allows nurses to provide high quality care and they are characterized among others factors by supportive leadership and adequate staffing resources [58, 59]. It would be interesting to assess directly the employer brand of hospitals or nursing homes with magnet status (c.f. the Pathway to Excellence Program of the American Nurses Credentialing Center (ANCC) for long-term care organizations with positive practice environments), i.e., whether a strong employer brand is a distinguishing mark for these facilities in being able to attract nurses in times of personnel shortage.

It is noteworthy that none of the control variables were significantly associated with employee referral. Especially unit characteristics such as FTE/100 beds, the percentage of registered nurses in a team or the amount of turnover might have been expected to be related to employee referral. However, either the variability of the items was too low or the overall

rates too favorable to show any association, or our model is incorrect in postulating these relationships. It might also be that work environment factors and intrinsic motivators outweigh the effect of unit characteristics; in a separate analysis, both higher skill mix and fewer turnovers were significant predictors of employee referral only if neither work environment nor intrinsic motivators were included in the model. The only other control variable showing a difference is educational background, with nurse aides showing a higher odds ratio for referral than registered nurses, while all other control variable remain insignificant. Clearly, facility, unit, resident, and care worker characteristics play a negligible role as antecedents of employee referral.

8.5.1. Strength and limitations

The strength of this study is that for the first time employee referral in nursing homes was examined in a nationally representative sample, giving insight into the importance of leadership, staffing resources, and quality of care for a nursing home's attractiveness. A limitation is that all care worker data stem from the same questionnaire, giving rise to the common method bias [60]. However, on the one hand, different answer options were used in the questionnaire to reduce the bias, and on the other hand, the sequence of the questionnaire items did not allow participants to gain understanding what relationships would be examined. The problem of the social desirability of answers was attenuated by the fact that all questionnaire could be sent directly to the study data collection center and confidential treatment was guaranteed. Another limitation is the study's cross-sectional design which does not allow causal conclusions to be drawn. Moreover, the results can only be generalized to Swiss nursing homes, since it is unclear e.g. whether contextual factors such as the examined facility and unit characteristics also lack importance in other cultural and political contexts.

8.5.2. Directions for future research and practice

For future research, it would be valuable to include more specific items about an organization's employer brand and programs to support employee referral including aspects

such as employee rewards for referral programs, employment conditions, employees' perception of organizational successes, or internal and construed external image [8, 61]. It would also be of interest how many of the recruited employees actually had contact with or were attracted by word-of-mouth referrals and what their effect was in the recruiting process. Moreover, not only the attraction but also the retention of skilled care workers is a prominent challenge for nursing homes. Knowledge in the field could be broadened by examining the relationship of employer branding with care workers' attraction and retention, including longitudinal designs or intervention studies with the implementation of employer branding, especially interventions designed to strengthen the organizational climate and leadership.

8.6.   Conclusion

In a time of a shortage of skilled workers, nursing homes need to establish their strengths as employers to attract potential employees. When formal methods of recruitment such as job advertisements lose their effectiveness, other venues like employee referrals gain importance as recruitment source. Insights into factors that are related to employee referral among current employees in nursing homes can help to inform the development of potentially effective recruitment strategies. Nursing homes with recruitment difficulties might profit from improving leadership and providing an environment with enough staffing resources that support care workers in providing good quality of care, which might positively increase employee referrals and the organization's attractiveness as employer [8]. A positive work environment and quality of care are also known to positively relate to job satisfaction and affective organizational commitment, reinforcing the positive effect.

8.7.   Acknowledgments

8.8. References

1. Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R. (2013). *[Survey of care workers in Swiss nursing homes - final report]* Basel: Universität Basel. Retrieved from http://nursing.unibas.ch/shurp

2. Juraschek, S. P., Zhang, X., Ranganathan, V. and Lin, V. W. (2012). United States registered nurse workforce report card and shortage forecast. *American Journal of Medical Quality*, *27*(3), 241-249.

3. Institute for the Future of Aging Services (2007). *The long-term care workforce: Can the crisis be fixed?* Retrieved from http://www.leadingage.org/uploadedFiles/Content/About/Center_for_Applied_Resear ch/Center_for_Applied_Research_Initiatives/LTC_Workforce_Commission_Report.p df

4. Keenan, P. (2003). The nursing workforce shortage: causes, consequences, proposed solutions. *Issue Brief (Commonw Fund)*, (619), 1-8.

5. National Center for Health Workforce Analyses, Bureau of Health Professions and Health Resources and Services Administration (2004). *Nursing aides, home health aides, and related health care occupations - national and local workforce shortages and associated data needs*. Retrieved from http://bhpr.hrsa.gov/healthworkforce/reports/rnhomeaides.pdf

6. OECD. (2011). *Health at a Glance 2011: OECD Indicators*. OECD Publishing.

7. Bostick, J. E., Rantz, M. J., Flesner, M. K. and Riggs, C. J. (2006). Systematic review of studies of staffing and quality in nursing homes. *Journal of the American Medical Directors Association*, *7*(6), 366-376.

8. Maxwell, R. and Knox, S. (2009). Motivating employees to "live the brand": A comparative case study of employer brand attractiveness within the firm. *Journal of Marketing Management*, *25*(9-10), 893-907.

9. Van Hoye, G. and Lievens, F. (2007). Investigating web-based recruitment sources: Employee testimonials vs word-of-mouse. *International Journal of Selection and Assessment*, *15*(4), 372-382.

10. Arnold, J., Coombs, C., Wilkinson, A., Loan-Clarke, J., Park, J. and Preston, D. (2003). Corporate images of the United Kingdom National Health Service; Implications for the recruitment and retention of nursing and allied health profession staff. *Corporate Reputation Review*, *6*(3), 223-238.

11. Greenawalt, B. J. (2001). Can branding curb burnout? One of the best ways to improve nursing's image as a whole is to combine current recruitment and retention strategies that "market" nursing. *Nursing Management*, *32*(9), 26-31.

12. Backhaus, K. (2004). Conceptualizing and researching employer branding. *Career Development International*, *9*(5), 501-517.

13. Sponheuer, B. (2010). *Employer Branding als Bestandteil einer ganzheitlichen Markenführung*. Wiesbaden: Gabler.

14. Ambler, T. and Barrow, S. (1996). The employer brand. [Academic Paper]. *Journal of Brand Management*, *4*(3), 185-206.

15. Lievens, F., Van Hoye, G. and Anseel, F. (2007). Organizational identity and employer image: Towards a unifying framework. *British Journal of Management*, *18*(s1), S45-S59.

16. Wilden, R. (2010). Employer branding: Strategic implications for staff recruitment. *Journal of Marketing Management*, *26*(1/2), 56-73.

17. Breaugh, J. A. (2013). Employee recruitment. *Annual Review of Psychology*, *64*(1), 389-416.

18. Van Hoye, G. (2008). Nursing recruitment: Relationship between perceived employer image and nursing employees' recommendations. *Journal of Advanced Nursing*, *63*(4), 366-75.

19. Van Hoye, G. and Lievens, F. (2007). Social influences on organizational attractiveness: Investigating if and when word of mouth matters. *Journal of Applied Social Psychology*, *37*(9), 2024-2047.

20. Ott, B., Blacksmith, N. and Royal, K. (2008) *Job seekers: Personal connections still matter*. Gallup Management Journal Retrieved from http://www.gallup.com/businessjournal/106957/personal-connections-still-matter.aspx

21. Weitzel, T., Eckkhardt, A., Laumer, S., von Stetten, A., Maier, C. and Weinert, C. (2014). *Recruiting Trends 2014*. Bamberg, Frankfurt am Main: Monster Worldwide Deutschalnd GmbH.

22. Immerschitt, W. (2014). *Employer Branding für KMU : Der Mittelstand als attraktiver Arbeitgeber*. Wiesbaden: Wiesbaden : Imprint: Springer Gabler.

23. Latham, V. M. and Leddy, P. M. (1987). Source of recruitment and employee attitudes: An analysis of job involvement, organizational commitment, and job satisfaction. *Journal of Business and Psychology*, *1*(3), 230-235.

24. Zottoli, M. A. and Wanous, J. P. (2000). Recruitment source research: Current status and future directions. *Human Resource Management Review*, *10*(4), 353-382.

25. Weller, I., Holtom, B. C., Matiaske, W. and Mellewigt, T. (2009). Level and time effects of recruitment sources on early voluntary turnover. *Journal of Applied Psychology*, *94*(5), 1146-62.

26. Cable, D. M. and Turban, D. B. (2001). Establishing the dimensions, sources and value of job seekers' employer knowledge during recruitment. In Ferris, G. R. (Eds.), *Research in Personnel and Human Resources Management* (pp. 115-163). New York: Elsevier Science.

27. Gallup (2014). *Engagement Index Deutschland 2013*. Retrieved from http://www.inur.de/cms/wp-content/uploads/Gallup%20ENGAGEMENT%20INDEX%20DEUTSCHLAND%202013.pdf

28. Bloemer, J. (2010). The psychological antecedents of employee referrals. *The International Journal of Human Resource Management*, *21*(10/12), 1769-1791.

29. Van Hoye, G. (2013). Recruiting through employee referrals: An examination of employees' motives. *Human Performance*, *26*(5), 451-464.

30. Lohaus, D. and Rietz, C. (2015). Arbeitgeberattraktivität. *Zeitschrift für Arbeits- und Organisationspsychologie A&O*, *59*(2), 70-84.

31. Shinnar, R. S., Young, C. A. and Meana, M. (2004). The motivations for and outcomes of employee referrals. [Empirical Study; Quantitative Study]. *Journal of Business and Psychology*, *19*(2), 271-283.

32. Wentzel, D., Tomczak, T. and Henkel, S. (2014). Can friends also become customers? The impact of employee referral programs on referral likelihood. [Empirical Study; Quantitative Study]. *Journal of Service Research*, *17*(2), 119-133.

33. Prentice, D. and Black, M. (2007). Coming and staying: A qualitative exploration of registered nurses' experiences working in nursing homes. *International Journal of Older People Nursing*, *2*(3), 198-203.

34. Harrison-Walker, L. J. (2001). The measurement of word-of-mouth communication and an investigation of service quality and customer commitment as potential antecedents. *Journal of Service Research*, *4*(1), 60-75.

35. Westphal, A. and Gmür, M. (2009). [Organizational commitment and its influencing factors: A qualitative meta-analysis]. *Journal für Betriebswirtschaft*, *59*(4), 201 - 229.

36. Mosadeghrad, A. M. and Ferdosi, M. (2013). Leadership, job satisfaction and organizational commitment in healthcare sector: Proposing and testing a model. *Materis Sociomedica*, *25*(2), 121-126.

37. Wallin, A. O., Jakobsson, U. and Edberg, A.-K. (2012). Job satisfaction and associated variables among nurse assistants working in residential care. *International Psychogeriatrics*, *24*(12), 1904-1918.

38. Castle, N. G., Degenholtz, H. and Rosen, J. (2006). Determinants of staff job satisfaction of caregivers in two nursing homes in Pennsylvania. *BMC Health Services Research*, *6*, 60.

39. Choi, J., Flynn, L. and Aiken, L. H. (2012). Nursing practice environment and registered nurses' job satisfaction in nursing homes. *The Gerontologist*, *52*(4), 484-492.

40. Havig, A. K., Skogstad, A., Veenstra, M. and Romøren, T. I. (2011). The effects of leadership and ward factors on job satisfaction in nursing homes: A multilevel approach. *Journal of Clinical Nursing*, *20*(23-24), 3532-42.

41. Probst, J. C., Baek, J. D. and Laditka, S. B. (2010). The relationship between workplace environment and job satisfaction among nursing assistants: Findings from a national survey. *Journal of the American Medical Directors Association*, *11*(4), 246-252.

42. Mathieu, J. E. and Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. *Journal of Organizational Behavior*, *27*(8), 1031-1056.

43. Bundesamt für Statistik. (2014). *Statistik der sozialmedizinischen Institutionen 2012 – Standardtabellen*. Neuchâtel: Bundesamt für Statistik.

44. Höpflinger, F. and Van Wezemael, J. (2014). *Wohnen im höheren Lebensalter. Grundlagen und Trends*. Zürich: Seismo.

45. Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and de Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

46. Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health*, *25*(3), 176-88.

47. Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R. and Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, *6*, 44.

48. McHugh, M. D. and Stimpfel, A. W. (2012). Nurse reported quality of care: A measure of hospital quality. *Research in Nursing & Health*, *35*(6), 566-75.

49. Wanous, J. P., Reichers, A. E. and Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology*, *82*(2), 247-52.

50. Dolbier, C. L., Webster, J. A., McCalister, K. T., Mallon, M. W. and Steinhardt, M. A. (2005). Reliability and validity of a single-item measure of job satisfaction. *American Journal of Health Promotion*, *19*(3), 194-8.

51. Felfe, J., Six, B., Schmook, R. and Knorz, C. (2010). *Fragebogen zur Erfassung von affektivem, kalkulatorischem und normativem Commitment gegenüber der Organisation, dem Beruf / der Tätigkeit und der Beschäftigungsform (COBB)*. Bonn: GESIS.

52. Baron, R. M. and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-82.

53. Graf, E., Cignacco, E., Zimmermann, K. and Zúñiga, F. (2015). Affective organizational commitment in Swiss nursing homes: A cross-sectional study. *The Gerontologist*, *Advance online publication*.

54. Field, A. (2009). *Discovering statistics using SPSS*. London: Sage.

55. Podsakoff, P. M., MacKenzie, S. B., Paine, J. B. and Bachrach, D. G. (2000). Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. *Journal of Management*, *26*(3), 513-563.

56. Uen, J. F., Ahlstrom, D., Chen, S. and Liu, J. (2015). Employer brand management, organizational prestige and employees' word-of-mouth referrals in Taiwan. *Asia Pacific Journal of Human Resources*, *53*(1), 104-123.

57. Fréchette, J. (2013). The organizational attraction of nursing graduates: Using research to guide employer branding. *The Health Care Manager*, *32*(4), 303.

58. Kramer, M., Schmalenberg, C. E. and Maguire, P. (2008). Essentials of a Magnetic work environment. *Nursing*, *34*(January 2008, Career Directory), 23-27.

59. Kramer, M. and Schmalenberg, C. E. (2005). Best quality patient care: A historical perspective on Magnet hospitals. *Nursing Administration Quarterly*, *29*(3), 275-87.

60. Podsakoff, P. M., MacKenzie, S. B. and Podsakoff, N. P. (2012). Sources of method bias in Social Science research and recommendations on how to control it. *Annual Review of Psychology*, *63*(1), 539-569.

61. Tosin, O. (2013). Employer branding: Moulding desired perceptions in current and potential employees. *Journal of Management and Sustainability*, *3*(3), 55.

CHAPTER 9

SYNTHESIS AND DISCUSSION

As discussed in the introduction, faced with workforce shortages, scarce financial resources and increasing demands concerning the scope and quantity of services, nursing homes are faced with two key questions: "How is it most feasible to maintain high quality of care?" and "What factors help to recruit and retain a qualified workforce?" Summarizing and synthesizing this dissertation's research, this final chapter presents an overview of key findings, discussing them in detail, further developing the conceptual framework, showing methodological strengths and limitations, and suggesting implications for further research and practice.

This dissertation was part of the Swiss Nursing Homes Human Resources Project (SHURP). In the tradition of the RN4Cast study [1], SHURP is a comprehensive examination of the relationships between nursing home care worker, resident, unit, and facility characteristics, including work environment and implicit rationing of nursing care, with both care worker and resident outcomes [2]. The research presented here focused on staffing and work environment factors and their relationships to implicit rationing of nursing care, quality of care, and the recruitment and retention of care workers.

9.1.   Key findings

Swiss nursing homes scored well in most areas examined here: care workers rated their work environments positively, showed high affective organizational commitment and job satisfaction, and reported low frequencies of implicit rationing of nursing care. An overwhelming majority (93%) rated the quality of care provided on their unit as good; and while recruiting registered nurses posed difficulties, the mean turnover among participating facilities was only 12%. Of all participating care workers, 86% would recommend their nursing homes to potential hires. Swiss nursing homes also rank well internationally: while the care quality and workforce issues they face are similar to those of homes in other countries, they are much less severe. Swiss nursing homes' main current challenge is not high

turnover or low quality of care, but maintaining high quality while adapting to ongoing political, financial, social, and regulatory changes.

A key finding of SHURP is the importance of work environment factors to outcome research in nursing homes. Our analyses have repeatedly shown the lack of a relationship between staffing aspects and outcomes, while work environment factors like teamwork and safety climate, staffing adequacy, and leadership were significantly related to quality of care, rationing and care worker outcomes. It seems that in a country with overall sufficient staffing levels like Switzerland, the work environment makes all the difference whether high quality of care can be achieved. Second, SHURP was the first study to examine implicit rationing of nursing care in nursing homes, showing the strong inverse relationship even low rationing frequencies can have with quality of care. The necessity for rationing puts especially at risk a core function of long-term care: building relationships with residents and offering person-centered care. Again, an adequate workload and better teamwork and safety climate seem to be crucial intervention points to reduce rationing and improve the quality of care. Third, the presence of a supportive leadership is a key factor in the recruitment and retention of care workers. Supportive leaders have team members who are highly committed to the organization and who do not only have a low intention to leave the organization, but also speak positively about their workplace, attracting new employees. Overall, interventions to improve teamwork, safety climate, and leadership seem to be the most promising next steps to improve nursing home quality. The next sub-chapters elaborate these key findings.

9.1.1. No relationship between staffing and quality of care – or is there?

With SHURP's publications, it has expanded the international perspective on workforce issues by combining various staffing variables (staffing level, grade mix, turnover) and work environment factors in a large-scale sample to assess their relationship with quality of care. It addresses thus former short-comings where staffing aspects or work environment were examined separately. Throughout the results, work environment factors proved to be

significantly related with outcomes while staffing variables were not. SHURP did not only measure care worker-reported quality of care but also separately assessed specific resident outcomes such as physical restraints, weight loss, or falls, but only incidental significant staffing- outcome relationships could be found with very low effect sizes (data unpublished). This overall lack of a staffing-outcome relationship has important policy-level ramifications. Regulatory bodies in the nursing home sector demand clear data on minimal staffing levels or minimal percentages of registered nurses to ensure quality of care. At first sight, our results might give a free pass to further reduce staffing levels and qualified personnel, since nursing homes need primarily to develop their work environments to guarantee a high quality of care. However, several factors need to be taken into account when interpreting the lack of a staffing-outcome relationship, among them the non-linearity of the relationship, the possibility that SHURP lacked the sensitivity to assess mechanisms or innovations that compensate for lower staffing levels and limitations in our measurements of resident outcomes.

The relationship between staffing levels and quality of care is not linear but threshold-based, i.e., staffing levels below a certain threshold result in negative resident outcomes [3]. In Swiss nursing homes, staffing rarely falls short of this threshold; however, in the US, as many as 90% of nursing homes report inadequate staffing levels [3]. This affirms majority of Swiss cantons' policy of stipulating minimal thresholds: regarding staffing levels, 16 of the country's 26 cantonal authorities–administering 72% of all Swiss nursing home places– demand that nursing homes base their staffing levels on the number and care dependency of residents, as measured using one of three instruments: the Resident Assessment Instrument for Nursing Homes (RAI-NH), the 'BewohnerInnen Einstufungs- und Abrechnungssystem' (Resident Classification and Accounting System, BESA) or the 'Planification Informatisée des Soins Infirmiers Requis' (Electronic Planning of Required Care, PLAISIR). For staff mix, 11 cantons (covering 67% of all nursing home places) prescribe that a minimum percentage

(15% to 25%) of care workers be registered nurses. These regulations are legally enforced: nursing homes failing to fulfill the criteria within a given time frame will be closed. Switzerland's well- established regulatory context might thus have hindered our search for relationships between staffing and outcomes.

A further explanation for the lack of findings concerning staffing factors is that SHURP was not sensitive enough to identify adaptations or innovations that allow nursing homes to compensate for lower staffing conditions in order to maintain their quality of care. Variations in the tasks and scope of practices of care worker professions involved in direct care, different compositions of units, or adaptations of care processes are possible strategies to handle staff variability [cf. 4]. A recent review including long-term care facilities in Limburg, the Netherlands, showed that nursing homes use a high variety of labor-saving and quality-improving innovations to confront the increasing demands [5]. These included e.g. the use of supportive technology, changes in the organization of residents' daily activities or in care workers' scheduling methods, or the introduction of self-managing teams. Corazzini et al. [6] linked variations in the scope of practice of licensed practical nurses between US states to quality of care. In Switzerland, the role of licensed practical nurses is equally variable, ranging from solely supervised activities to most of the tasks normally performed by registered nurses, but in SHURP we did not assess the actual task distribution among professions. As for the variation of unit organization, in SHURP, units were delineated by the facilities as groups of employees working under dedicated management, collectively caring for clearly defined clusters of residents [4]. Still, this definition allowed considerable room for organizational variability: in some nursing homes large organizational units administered more than 50 beds and several work groups, with staff floating between them; in others, registered nurses were responsible for several units, each comprised of core teams of licensed practical nurses and nurse aides. Some homes had units integrating activating therapists or housekeeping personnel; others kept these persons floating between units. Additionally, some

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nursing homes employed gerontological nursing experts who supported all units, likely influencing quality of care, but without being counted in any measure. Such variability impedes accurate assessment either of staffing levels or staff mixes, and we still lack a common understanding in international research how to operationalize these differences [4]. Future research needs to develop measurements of the actual task distribution among professions, which is still a black box in nursing homes [7]. Moreover, nursing homes are not waiting for scientific evidence to adapt to the challenges confronted; they continually develop new innovations to adapt to the market, although often without having any evidence for their effectiveness [5]. While it seems very difficult to measure the wide variety of adaptations and innovations, future research could include a measurement of readiness for change or innovation [8] as a proxy for this adaptability to new challenges. It can be hypothesized that organizations with higher readiness for change will reach better outcomes with the staffing available.

Other reasons might have contributed to the failure to find more than incidental significant relationships between staffing and resident outcomes such as falls or weight loss. First, we were not able to collect data at the individual resident level, so that we could not assess residents' diagnoses or risk factors linked to specific outcomes. Currently, nursing homes in Switzerland use three independent instruments to assess resident data. Unfortunately, as these instruments employ different questions and time frames to assess outcome data, their data are not comparable. This led SHURP's research team to ask unit supervisors for aggregated data instead of having them fill out individual sheets for the over 10'000 residents included in the study. Second, for certain outcomes, the variability was too low for any predictors to explain. Overall, several of the outcomes were rather rare, e.g., 70% of units had no residents with pressure ulcers; 63% had none with fall-related injuries; and no significant differences between either units or facilities related to these outcomes. This suggests that these resident outcomes–although commonly measured for international nursing

home research [9] –have minimal relevance to the Swiss context. Third, for other outcomes, e.g., weight loss, the predictors used may not have been fully appropriate to explain any outcome variability. Based on the literature, weight loss depends on a broad range of factors, including, at the organizational level, screening for and treatment of malnutrition, collaboration with nutritional therapists, and adequate food options and meal times [10-13], and at the resident level, risk factors such as loss of appetite, depression, oral health problems, dysphagia, or adverse medication effects [11, 13-18]. Partly to avoid high questionnaire burden, and partly because the related data were either unavailable or could be collected only at a high cost, none of these factors were assessed in SHURP. Future research needs to be more comprehensive for these specific outcomes, including resident level data, organizational processes related to the outcome and unit level work environment and staffing to better assess these relationships.

9.1.2. Work environment as key factor

In all our studies, work environment factors surpassed the importance of staffing aspects in their relationship with outcomes. Reviews so far showed inconsistent and inconclusive results concerning the relationship of staffing with resident outcomes [19-22] and the lack of consistently including work environment factors in outcomes research might be one of the reasons for the variability found. The importance of the work environment was corroborated by other studies. In acute care, Aiken et al. [23] found that the effect of higher patient-to-nurse ratios on failure-to-rescue rates depended on the work environment: in hospitals with poor work environment, the effect was nil. In nursing homes in Missouri, Rantz et al. [24] mixed observational study found that facilities with no significant differences in staffing or staff mix, but whose quality of care differed widely, could be differentiated based on their leadership and care delivery practices. The work environment seems to make all the difference to reach a good quality of care.

A case in point for the importance of work environment over against staffing numbers is the lack of any correlation between actual staffing levels and care workers' perception of staffing resources in SHURP. Higher staffing levels per resident do not automatically cause care workers to perceive more adequate resources for the work at hand, irrespective of residents' care dependency on the unit. According to interviews with hospital nurses, their perceptions are also impacted by issues such as administrative tasks supplanting direct patient care time, inefficient organizational processes, difficulties in interdisciplinary communication, lack of involvement in workload-related decision-making, difficulties quantifying the value of psychosocial care, inadequate personnel mix, a lack of staff cohesiveness, and unfamiliarity with their patients' overall situations [25, 26]. Nursing home staff likely considers similar issues when rating staffing adequacy. This highlights two important points: first, that care workers' perceptions need to be taken seriously concerning resources, and second, that intervention points surpass–but by no means exclude–staffing level increases. A thorough analysis of organizational processes, teamwork and (interdisciplinary) communication, or task distributions might provide better solutions than only increasing staffing levels.

9.1.3. Implicit rationing of nursing care in nursing homes

SHURP was the first study anywhere to measure implicit rationing of nursing care in nursing homes. One important finding was the relationship between even very low levels of rationing and care workers' perceptions of quality of care. This sends an important message to other countries, many of which presumably suffer from resource deficiencies and levels of rationing far more severe than in Switzerland. We assume that care home workers relate quality of care not only to maintaining residents' safety and hygiene, but to providing person-centered care, including the development and support of productive caring relationships. While this assumption requires further exploration, person-centered care is acknowledged as an important aspect of residents' well-being [27, 28] and a core function of long-term care [29]. Therefore, it is essential to identify contextual barriers–possibly via studies on implicit

rationing–along with possible intervention points. BERNCA-NH provides the means for nursing home managers and policy makers to monitor imbalances between residents' care needs and available resources, guiding them in quality improvement initiatives.

Interestingly, our analysis indicated a four-factor structure in the instrument, differentiating separate aspects of rationing. This was a new finding compared to the single-factor original instrument used in the hospital setting, although it seems quite self-evident that certain groups of activities are handled differently than others under time constraints. Until now, research into relationships between rationing and outcomes has focused predominantly on overall rationing ratings [30]. With this new-found grouping, further outcomes research can better explore specific consequences of rationing. It can be assumed that rationing of caring activities is related to person-centered care and residents' quality of life, while frequent rationing of activities of daily living might correlate with weight loss or pressure ulcers, and the rationing of rehabilitative activities to functional loss. So far, only two studies have looked at the relationship of specific missed care activities with outcomes. One study in acute care examined the association of selected rationed activities (ambulation, patient assessments each shift, focused reassessment, response to call light, and assistance with toileting), with the outcome of patient falls, finding that these missed care items mediated the relationship between staffing and falls [31]. One study in nursing homes linked seven missed care activities to the percent of residents with urinary tract infection (UTI), most important among them the failure to administer medications on time and to adequately survey residents [32]. While no clear explanation was available for the first point (the relevant item gathered no UTI- specific data), the second confirmed the hypothesis that inadequate surveillance would correlate with increases in preventable adverse patient events. Considering that the long-term goal of this research is to enhance quality of care in nursing homes, focusing minutely on the details of relationships between specific items or item groups with a battery of single resident outcomes would be of little value. However, selected theory-driven survey and intervention

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studies might well further the field by helping to define sub-groups of rationing items especially sensitive to poor resident outcomes [30].

SHURP was just a first approach to examine rationing in nursing homes. Based on its results, to explore the subject in greater depth it would be useful to further assess the theme from various methodological angles (e.g. direct observation, interviews) [30], with input from a broad range of stakeholders (e.g., care workers, supervisors, nurse directors, residents, relatives, physicians). This includes understanding what happens not only at the care worker/resident interface, but also at the junctions of contextual factors (e.g., the interplay of leadership behavior, philosophy of care, and skill mix with task distribution and delegation possibilities), and where interactions between players influence the decision-making process toward rationing certain aspects of care or dedicating more time to one resident but less to another with similar needs. This differentiation could help both to complete care workers' perceptions with other perspectives (including the observation of actual rationing and residents' perspective) and to develop effective individual and contextual interventions to encourage care workers to systematize their decision-making and reduce rationing.

9.1.4. Recruitment and retention of care workers

With a mean turnover rate of 11% (median: 10%) at the facility level, the retention of care workers is not currently a major issue in Swiss nursing homes. Even regarding registered nurses, the situation is very similar (mean: 12%, median: 7%); and regarding the range of related data, only 7 of 159 facilities had turnover rates above 25%. This high fidelity is reflected in the high overall affective organizational commitment among Swiss care workers. Compared to international norms, Swiss nursing homes have fewer problems with employee retention, but equal challenges with recruitment. As the need for care workers grows, they face shortages of trained personnel, attrition via retirement and a high dependency on nurses educated abroad [33-35].

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This dissertation includes information on two very specific outcomes related to recruitment and retention: employee referral and affective organizational commitment (which we linked to intention to leave). As with quality of care, the work environment was of paramount importance for both outcomes. However, the most significant work environment factors for both outcomes were neither teamwork and safety climate nor staffing resources or workload, but supportive leadership, followed by care worker-rated quality of care. To improve recruitment and retention, then, further development of nursing home leadership at all levels is a promising strategy.

Currently, little is known of the effects of leadership development on recruitment and retention in nursing homes. As for recruitment via employee referral, no available studies have yet looked at its connections with either leadership or leadership development in nursing homes, let alone the effect of leadership development on recruitment efforts. Regarding retention, a literature review of mostly acute care studies positively related transformational leadership and supervisor support with nurses' intention to stay [36]; and a narrative review of leadership in the aged care sector found that the stability of managerial leadership impacted staff retention importantly [37]. Further, a US study of nurse aides found supervisor support related to intention to stay [38]; however, two nursing home studies from Canada and Australia found no relationship between supportive leadership and intention to stay [39, 40]. Examining the relationship of management practices with turnover, Anderson et al. [41] noted the complexity of nursing home organization, finding various interactions between management climate and communication between staff. Overall, reward culture, communication openness and accuracy correlate positively with turnover, but different educational backgrounds (registered and licensed practical nurses, nurse aides) and power distances may demand different leadership styles [41]. Indeed, nursing homes' organizational complexity might hinder their adoption of research findings or leadership development programs from acute care settings. Additionally, Harvath's 2008 review [42] and evaluation

of nursing home leadership programs concluded that evidence of their effectiveness remained weak. Overall, while leadership qualities clearly affect nursing homes' recruitment, retention and quality of care, little knowledge exists as to which aspects of leadership programs actually foster success. Further explorations of effective interventions are needed.

9.2. Conceptual framework of SHURP

The basis of SHURP's conceptual framework was Donabedian's differentiation of structure, process, and outcome indicators of quality, which follows the principle that good structures allow for good processes which in turn increase the likelihood of good outcomes [43]. Donabedian's distinction of the three aspects of quality continues to be very helpful, though it allows no determination of sequence. As postulated by the Quality of Health Outcomes Model, the relationships between structure and processes, along with their relationships with outcomes, are dynamic [44, 45]: they are also reciprocal, i.e., structural aspects and process factors affect one another. For example, not only might better teamwork help care workers to reduce rationing of activities such as emotional support of residents, but reduced rationing might also improve the sense of teamwork, as workers pitch in and help each other complete their work. Our studies confirmed the SHURP framework's postulation that both structure and process factors are related to outcomes, i.e., the combination of work environment and implicit rationing of nursing care was significantly related to quality of care. Our findings did not support the postulation of Mitchell's Quality of Health Outcomes Model that the relationship of process factors with outcomes is fully mediated by structural aspects (patient and system factors) [44], at least not with the structural items we measured. If accurate, this would have precluded a significant relationship between rationing of nursing care and quality of care once organizational characteristics and work environment factors were included in our analytic models.

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As a general framework for a comprehensive workforce study of relationships at the organizational level, the SHURP framework kept our work appropriately oriented. Positioned at the organizational meso-level, it highlights contextual factors contributing to care worker and resident outcomes with the goal of isolating modifiable intervention points. For each outcome studied, the framework was adapted to clearly represent the target aspects. One difficulty was that established models or frameworks already existed for several of our studied outcomes, e.g., affective organizational commitment. As SHURP's goals did not include developing new frameworks for established outcomes, the SHURP variables were integrated in existing models or frameworks. However, while the expected questionnaire burden allowed no further expansion of the number of items, SHURP's range of themes was invariably too broad and/or too detailed to fit any otherwise appropriate frameworks, i.e., specific aspects were missing (e.g., employees' symbolic image of their organization for employee referral) or were covered only by single-item questions (e.g., job satisfaction, autonomy). Overall, because SHURP's conceptual framework was based primarily on quality of care models, care worker outcomes were covered less fully than those for residents. Nevertheless, for the first time, the SHURP framework allowed a comprehensive examination of the Swiss nursing home scene and shed light on various workforce-related issues. For future studies it would be advisable to concentrate on narrower ranges of care worker outcomes (e.g., intention to leave, stress, health issues), and to use close-fitting care worker outcome-specific frameworks.

Unfortunately, the framework could not be confirmed to help explain relationships between organizational factors, work environment, or rationing of care and specific resident outcomes such as weight loss or falls. Several aspects that might have contributed to this lack of findings were discussed above, such as the threshold hypothesis, measurement problems, lack of resident level of analysis, lack of variability in outcomes, and lack of sensitivity of selected organizational variables. A further option might be that a fresh approach is necessary accounting more fully for healthcare organizations' systemic complexity. A systems thinking

approach would focus on the connections and interactions between diverse components of such a system, e.g., its information flow, and its embeddedness within higher-level systems (e.g., regional and national healthcare systems), observing changes that might help explain their interconnectedness [46]. To go a step further, a complexity science approach would treat the organization as a complex system continuously reorganizing itself in response to nonlinear interactions and positive and negative feedback [41, 47]. Where the agents within a complex system are themselves complex systems capable of learning–as are a nursing home's staff, its residents and their relatives–the entire paradigm is referred to as a complex adaptive system [48, 49]. Complexity science focuses on how outcomes, as e.g. quality of care, result from relationships between system agents. These are often unpredictable and non-linear in the sense that small causes can have large effects [47, 49]. Complexity science is a promising tool to understand how relationships and system interdependencies hinder or improve outcomes. Considering that research teams are themselves complex adaptive systems interacting with nursing homes, a complexity science approach might also help to develop strategies to handle the challenges encountered when implementing research in this context [49]. Future nursing home outcomes research could be based on models developed in complexity science as a promising approach to better understand how quality of care emerges [50, 51].

9.3.   Strength and limitations of methods

SHURP was the first national representative nursing home study to comprehensively examine the relationship of organizational, resident and care worker characteristics, work environment, and implicit rationing of nursing care in relation to both care worker and resident outcomes [2]. One of its strengths was the simultaneous collection of data on organizational characteristics and care workers' perceptions of their work environments and outcomes, allowing same-time comparisons within nursing homes. Additionally, collecting data on staffing variables from personnel records, while those on the perception of work

environment or care worker outcome were self-reported, reduced the common method bias [52]. The large sample size, including 163 nursing homes and 5323 care workers, allows comprehensive assessment of relationships between a wide range of variables, adding to international research with new insights, as e.g. in the area of rationing. As a further strength, its stratified random sampling strategy allowed clear representation both of different-sized nursing homes and of Switzerland's German-, French-, and Italian-speaking regions (nursing homes in the fourth (Rhaeto-romanic) region were included as appropriate in either the German- or Italian-speaking segments). To assess the sample's representativeness, we compared data on several structural characteristics (e.g., resident care load, mean length of stay, mean age of residents, and number of registered nurses / 1000 care days) of the included nursing homes with those of other nursing homes across Switzerland, indicating no significant differences. Together with this methodological advantage, the very good overall response rate (76%) contributes to the study's high external validity and allows inferences regarding all Swiss nursing homes with 20 or more beds. International inferences must be drawn with caution due to variations in regulatory and cultural contexts and the overall high scores in staffing and work environment of Swiss nursing homes. However, key findings such as the high impacts of work environment factors and implicit rationing of nursing care on quality of care provide international research with insights that should be further explored.

SHURP was the first Swiss study to collect a comprehensive dataset from nursing homes at the unit level across all language regions. Although the Swiss Federal Office of Statistics has collected structural data on nursing homes annually since 1997 (http://www.bfs.admin.ch/bfs/portal/de/index/themen/14/03/02.html), these data are only available at the facility level. However, SHURP shows that, since the variability between units in the same facility can be high, the organization of unit level work teams calls for analyses of relationships at this level. From hospital studies we know that units show significant variations concerning work environment, which relate to nurse as well as patient

outcomes [53]. In a Canadian nursing home study [4], when both the unit- and facility-level were taken into account, the unit-level added to the explained work environment variance. This effect calls for further exploration in international nursing home research. For example, after assessing how nursing homes are organized, the unit-level should be included in research about staffing and quality of care [4].

SHURP also provided a strong methodological basis for the development and validation of instruments in multilingual research projects. All instruments used were assessed by relevant experts for content validity, tested for comprehensibility in focus group interviews with care workers from different educational levels, translated and back-translated to verify semantic equivalence, and pilot tested. This made SHURP's results comparable across all of Switzerland's language regions. Research in other multilingual countries can profit from this methodological basis to prepare multilingual projects in nursing homes.

One limitation of SHURP is its cross-sectional design, which precludes conclusions regarding causal relationships. Although longitudinal workforce studies would more effectively examine the relationships between nursing home staffing and resident outcomes [19], in the Swiss context it was important to start with cross-sectional national data. Based on the experience with and analyses of the SHURP data it will be possible to build longitudinal studies that better encompass the difficulties inherent in mixed workforce studies in different cultural and regulatory contexts as is the case in Switzerland.

A further limitation was the use of care worker-reported quality of care data, which introduces a common method bias [52]. Where predictors and outcomes are measured via the same methods, that method can have a systematic effect of either inflating or deflating any observed correlation. In the SHURP study, work environment aspects, implicit rationing of nursing care and quality of care were all rated by the same care workers using a single questionnaire. By attempting to appear consistent and rational in the answers they provide, raters can inadvertently produce false predictor-outcome covariance. Additionally, raters can

have implicit theories about the relationships between measured constructs, guiding their answers to support those theories [52]. Also, as most raters would presumably attribute high quality to their own care and it might seem inconsistent to continue working for an institution that provides low quality of care, these data can also be subject to social desirability bias. These and other biases might have distorted our findings of significant relationships. However, SHURP included several strategies to reduce common method bias. Specifically, we separated the measurements methodologically, varying response formats between themes. Moreover, the order of the items in the questionnaire did not reveal which relationships we intended to examine. However, a more effective way to overcome this limitation would be simply to obtain data on the predictor and outcome variables from different sources, as we did for organizational characteristics.

9.4.   Implications for research

The SHURP data allow us to delve further into critical workforce issues. While this dissertation project is complete, ongoing analyses will deepen our understanding of work environment factors related to intention to leave and of the perceptions of care workers with different educational background concerning their work environment. Planning is already underway for the next SHURP study, which will deepen our understanding of selected variables such as leadership and teamwork over time and provide participating nursing homes the possibility of a more in-depth benchmarking.

As noted above, several of SHURP's key findings need further exploration, not only to better understand them, but also to test interventions that could improve the quality of nursing home care. For the former, further exploring the scope of nursing home care workers' daily practices and their task distributions would extend our understanding of skill and grade mixes based on more than professional background. Clarifying and classifying the many forms of unit organizations and models of care and what care workers mean when they speak about

inadequate staffing resources, as well as an assessment of a unit's readiness for change or innovation would also benefit nursing home research. Regarding the issue of rationing of care, especially concerning processes of daily care, a deeper understanding is necessary to improve resident outcomes. Here, a broader methodological approach is needed, including direct observations or in-depth interviews. Case studies would further clarify the relationships between sub-groups of rationing and specific resident outcomes.

It might be helpful to frame these questions within complexity science, looking at system parameters such as information exchange within teams, along with the connections and cognitive diversity between staff members [50]. These relational issues could be key to understanding why neither skill mix nor staffing levels per se were significantly related to quality of care, and how teams are able to compensate for resource shortfalls. Good information exchange, connections, and high cognitive diversity are interaction strategies that help nursing homes to solve problems and adapt to changes, delivering thus better care quality [51]. A complexity science approach may also explain which aspects of leadership-staff interactions support the recruitment and retention of care workers.

An important next step is the realization of intervention studies focusing on nursing home work environments, with the long-term goal of improving quality of care, and key direct goals of enhancing leadership skills and developing effective teamwork. For both leadership and teamwork, programs have been developed and tested [42, 54-59], though evidence remains modest concerning their effect, and cultural translations would be needed for Switzerland.

Based on the results reported here, several of the measured quality indicators are less relevant than expected in the Swiss context. The OECD conceptual framework for long-term care quality postulates three dimensions of quality [60]: (1) care effectiveness and user safety (e.g., best possible health and social care, rehabilitation, prevention of adverse events); (2) patient-centeredness (e.g., responsiveness, empowerment, provision of choice of service); and

(3) care co-ordination and integration (e.g., harmonization of transitions, continuum of care between health care providers). Concerning care effectiveness and user safety, SHURP assessed medical quality indicators and adverse events (e.g., weight loss, fall-related injuries, and pressure ulcers). However, patient-centeredness and care co-ordination and integration (points 2 and 3 above) may actually be more important quality measures for Switzerland, and international research is addressing these issues increasingly.

Analyses of SHURP's data on rationing of care suggested that future studies and interventions should focus on patient-centeredness. Unfortunately, while person-centered care is a core concept of long-term care, rather weak study designs and small sample sizes to date mean little solid evidence exists on its antecedents and consequences [61-63]. At the most basic level, person-centered care demands consideration of residents' and their relatives' perspectives. In coordination with SHURP, then, the University of Applied Sciences of Bern surveyed a random sample of residents within the SHURP sample on their perceptions of their quality of care and quality of life. Although analyses of the data will begin only after the finalization of this dissertation, the results should provide valuable insights and help to identify future targets for research and intervention.

The third point of the OECD framework addresses the increasing importance of coordinating care across the homecare-hospital-daycare-nursing home continuum and other settings. This suggests new areas of exploration, e.g., transitions between nursing homes and other healthcare providers, including avoidable hospitalizations from nursing homes, medication reconciliation and error risks at transition points, and communication between healthcare providers. Though international research is tackling related issues [64-68], these areas of the Swiss nursing home landscape remain barely touched. Some, such as avoidable hospitalizations, are deeply connected with staffing and work environment issues, notably the scope of practice of the staff present on shifts, or the need for information flow and cognitive

diversity to foster recognition, assessment and communication of residents' well-being in order to avoid hospitalizations where possible through early interventions.

Another inviting topic is the need for more fluid care models to keep pace with the demographic shift toward more care-dependent older persons. Older persons need to receive the right care at the right place and the right time [cf. 69]. As care is often isolated within specific healthcare settings, innovative solutions are needed to integrate that care across multiple settings. As a first step, based on selected criteria such as person-centeredness, efficiency, and safety, it would be useful to identify, describe and compare such innovative models before testing the effects of specific models on the well-being of older persons and care workers.

9.5.   Implications for practice

SHURP worked with the convoy principle, including regular discussions of the study and its implications concerning practice and policy with the leadership of participating nursing homes and other stakeholders. To help the nursing homes identify their strengths and weaknesses, each received an in-depth report of their results and a benchmarking report allowing them an overall comparison of their survey results. Due to the comprehensiveness of the study, implications for practice were broad. In a follow-up study, roughly 75% of the participating nursing homes reported that they identified room for improvement, mostly in the areas of work environment and care worker outcomes (unpublished data).

Our articles [70-72] suggest three areas of the work environment where improvements would have the most potential to overcome deficits: teamwork and safety climate, staffing adequacy and workload, and leadership. Although we could not establish any causal relationship between work environment factors and resident or care worker outcomes, these might be promising points of intervention to improve both quality of care and care worker outcomes.

Regarding leadership development, important areas have been delineated above (cf. 9.1.4: Recruitment and retention of care workers). Teamwork includes such aspects as communication, coordination, collaboration, and shared decision-making [73, 74]. A range of specific competencies are needed to work efficiently as a team, among them shared goals, closed-loop communication, conflict management, mutual trust, and shared mental models [73]. Different training modules have been successfully applied in nursing homes, e.g., TeamSTEPPS [58] and CONNECT [57, 75], focusing on staff interactions between care workers. However, while numerous courses are available to support nursing homes to develop various aspects of teamwork, we know of no programs evaluated for the Swiss context.

To develop a productive safety climate, it is first important to introduce system-oriented thinking to the organization, removing "blame and shame" responses to errors, which hinder organizational learning [76, 77]. Numerous interventions support organizational learning for improved patient safety, such as the "learning from defects" tool [78, 79], system analysis of clinical incidents [80], or leadership walk-rounds [81]. Additionally, analyses of critical incident reporting systems can support the use of serious errors to provide learning experiences and quality improvements [82]. However, to be accepted by care workers, these interventions first require the upper and middle management to commit firmly to a positive and just safety culture.

To tackle the perception of inadequate staffing resources and high workload, it is necessary first to check the actual staffing levels, then to analyze and adjust organizational processes and work distributions as necessary. As much as possible, care workers should be relieved of administrative overload and encouraged to participate in workload-related decision-making [25, 26]. Additionally, ongoing monitoring and benchmarking of work environment characteristics, rationing of care and quality of care helps nursing homes to recognize improvements and persistent weaknesses.

Though SHURP addressed nursing homes concerning how to improve the quality of their care, attract new employees and retain existing ones, the nursing shortage is a problem that cannot be solved by the facilities alone. An overall report of SHURP's results has also been made available to the public. As the issues raised are linked to how long-term care is financed, how education of care workers is organized and what human resources are available, they need to be addressed at the policy level.

Considering the high variability between high- and low-performing nursing homes, the growing competition to attract new personnel may foster much-needed innovation. However, the development and implementation of new models of care for older persons, the promotion of new roles for nurses, such as advance practice nurses in geriatric care, the integration of new technologies, and ongoing redefinition of care workers' duties cannot be managed by each nursing home individually. Alongside governmental support at the municipal, regional and national level, the concerted effort, vision and knowledge of nursing home, professional, patient, and educational bodies will be essential to confront the challenges ahead and maintain the quality of care provided.

9.6. Conclusions

Nursing homes are responsible not only for their residents' quality of care but also for their quality of life. Therefore, person-centered care, considering residents' life choices, autonomy, privacy, intimacy, and dignity, is fundamental to their daily care practice [83]. However, they are facing complex challenges: while growing numbers of residents with chronic diseases and complex psychosocial conditions demand top-quality care, many of their most experienced care workers are retiring, and recruitment of qualified staff is increasingly difficult. Recognizing the seriousness of these issues, SHURP provided a first comprehensive examination of how staffing, work environment, and rationing of care are related to resident and care worker outcomes.

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Among its many findings, SHURP showed that under time constraints, rationing is applied first to the relational aspects of care, hindering person-centered care. Although an adequate overall staffing level is essential, higher staff numbers do not correlate with improved patient outcomes. In fact, assuming adequate staffing resources, patient outcomes correlate strongly with manageable workloads and positive work environment factors, particularly positive teamwork and safety climate. Another work environment factor, supportive leadership, is related to successful recruitment and retention. Overall, then, improvement of the work environment holds considerable potential to tackle many of nursing homes' most prominent problems.

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9.7. References

1. Sermeus, W., Aiken, L., Van den Heede, K., Rafferty, A., Griffiths, P., Moreno-Casbas, M., Busse, R., Lindqvist, R., Scott, A., Bruyneel, L., Brzostek, T., Kinnunen, J., Schubert, M., Schoonhoven, L., Zikos, D. and RN4CAST consortium. (2011). Nurse forecasting in Europe (RN4CAST): Rationale, design and methodology. *BMC Nursing*, *10*(1), 6.

2. Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. and De Geest, S. (2013). Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. *Journal of Advanced Nursing*, *70*(4), 915-26.

3. Center for California Health Workforce Studies (2006). *An aging U.S. population and the health care workforce: Factors affecting the need for geriatric care workers*. Retrieved from http://futurehealth.ucsf.edu/Content/8877/2006_02_An_Aging_US_Population_and_the_Health_Care_Workforce_Factors_Affecting_the_Need_for_Geriatric_Care_Workers.pdf

4. Estabrooks, C. A., Morgan, D. G., Squires, J. E., Bostrom, A. M., Slaughter, S. E., Cummings, G. G. and Norton, P. G. (2011). The care unit in nursing home research: Evidence in support of a definition. *BMC Medical Research Methodology*, *11*, 46.

5. Thoma-Lürken, T., Bleijlevens, M. H., Lexis, M. A., Hamers, J. P. and de Witte, L. P. (2015). An overview of potential labor-saving and quality-improving innovations in long-term care for older people. *Journal of the American Medical Directors Association*, *16*(6), 482-9.

6. Corazzini, K. N., Anderson, R. A., Mueller, C., Thorpe, J. M. and McConnell, E. S. (2013). Licensed practical nurse scope of practice and quality of nursing home care. *Nursing Research*, *62*(5), 315-24.

7. Bettger, J. P., Sochalski, J. A., Foust, J. B., Zubritsky, C. D., Hirschman, K. B., Abbott, K. M. and Naylor, M. D. (2012). Measuring nursing care time and tasks in long-term services and supports: One size does not fit all. *The Journal of Nursing Research*, *20*(3), 159-68.

8. Gagnon, M. P., Attieh, R., Ghandour el, K., Legare, F., Ouimet, M., Estabrooks, C. A. and Grimshaw, J. (2014). A systematic review of instruments to assess organizational readiness for knowledge translation in health care. *PloS one*, *9*(12), e114338.

9. Bostick, J. E., Rantz, M. J., Flesner, M. K. and Riggs, C. J. (2006). Systematic review of studies of staffing and quality in nursing homes. *Journal of the American Medical Directors Association*, *7*(6), 366-376.

10. Cowan, D. T., Roberts, J. D., Fitzpatrick, J. M., While, A. E. and Baldwin, J. (2004). Nutritional status of older people in long term care settings: Current status and future directions. *International Journal of Nursing Studies*, *41*(3), 225-237.

11. Volkert, D., Bauer, J. M., Frühwald, T., Gehrke, I., Lechleitner, M., Lenzen-Großimlinghaus, R., Wirth, R., Sieber, C. and DGEM Steering Committee. (2013). Leitlinie der Deutschen Gesellschaft für Ernährungsmedizin (DGEM) in Zusammenarbeit mit der GESKES, der AKE und der DGG. Klinische Ernährung in der Geriatrie. Teil des laufenden S3-Leitlinienprojekts Klinische Ernährung. *Aktuelle Ernährungsmedizin*, *38*(03), e1-e48.

12. Schreier, M. M., Volkert, D. and Bartholomeyczik, S. (2009). Instrumente zur Erfassung der Ernährungssituation in der stationären Altenpflege: PEMU. In Bartholomeyczik, S. and Halek, M. (Eds.), *Assessmentinstrumente in der Pflege. Möglichkeiten und Grenzen* (2. aktual. Auflage ed.). Witten: Schlütersche.

13. DNQP (Deutsches Netzwerk für Qualitätsentwicklung in der Pflege) (Eds). (2009). *Expertenstandard Ernährungsmanagement zur Sicherstellung und Förderung der oralen Ernährung in der Pflege*. Osnabrück: Fachhochschule Osnabrück.

14. DiMaria-Ghalili, R. A. (2008). Nutrition. In Capezuti, E., Zwicker, D., Mezey, M. and Fulmer, T. (Eds.), *Evidence-based geriatric nursing protocols for best practice* (3rd ed.). New York: Springer.

15. Volkert, D. (2004). Leitlinie Enterale Ernährung der DGEM und DGG. *Aktuelle Ernährungsmedizin*, *29*, 190-197.

16. Sloane, P. D., Ivey, J., Helton, M., Barrick, A. and Cerna, A. (2008). Nutritional issues in long-term care. *Journal of the American Medical Directors Association*, *9*(7), 476-485.

17. Tamura, B. K., Bell, C. L., Masaki, K. H. and Amella, E. J. (2013). Factors associated with weight loss, low BMI, and malnutrition among nursing home patients: A systematic review of the literature. *Journal of the American Medical Directors Association*, *14*(9), 649-55.

18. Löser, C., Lübbers, H., Mahlke, R. and P., L. (2007). Der ungewollte Gewichtsverlust des alten Menschen. *Deutsches Ärzteblatt*, *104*, 3411 – 3420.

19. Backhaus, R., Verbeek, H., van Rossum, E., Capezuti, E. and Hamers, J. P. (2014). Nurse staffing impact on quality of care in nursing homes: A systematic review of longitudinal studies. *Journal of the American Medical Directors Association*, *15*(6), 383-393.

20. Spilsbury, K., Hewitt, C., Stirk, L. and Bowman, C. (2011). The relationship between nurse staffing and quality of care in nursing homes: A systematic review. *International Journal of Nursing Studies*, *48*(6), 732-750.

21. Shin, J. H. and Bae, S. H. (2012). Nurse staffing, quality of care, and quality of life in US nursing homes, 1996-2011: An integrative review. *Journal of Gerontological Nursing*, *38*(12), 46-53.

22. Castle, N. G. (2008). Nursing home caregiver staffing levels and quality of care: A literature review. *Journal of Applied Gerontology*, *27*(4), 375-405.

23. Aiken, L. H., Cimiotti, J. P., Sloane, D. M., Smith, H. L., Flynn, L. and Neff, D. F. (2011). Effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Medical Care*, *49*(12), 1047-53.

24. Rantz, M. J., Hicks, L., Grando, V., Petroski, G. F., Madsen, R. W., Mehr, D. R., Conn, V., Zwygart-Staffacher, M., Scott, J., Flesner, M., Bostick, J., Porter, R. and Maas, M. (2004). Nursing home quality, cost, staffing, and staff mix. *Gerontologist*, *44*(1), 24-38.

25. van Oostveen, C. J., Mathijssen, E. and Vermeulen, H. (2015). Nurse staffing issues are just the tip of the iceberg: A qualitative study about nurses' perceptions of nurse staffing. *International Journal of Nursing Studies*, *52*(8), 1300-1309.

26. Kramer, M. and Schmalenberg, C. (2005). Revising the Essentials of Magnetism tool: There is more to adequate staffing than numbers. *Journal of Nursing Administration*, *35*(4), 188-98.

27. Custers, A. F., Westerhof, G. J., Kuin, Y. and Riksen-Walraven, M. (2010). Need fulfillment in caring relationships: Its relation with well-being of residents in somatic nursing homes. *Aging & Mental Health*, *14*(6), 731-9.

28. Sjogren, K., Lindkvist, M., Sandman, P. O., Zingmark, K. and Edvardsson, D. (2013). Person-centredness and its association with resident well-being in dementia care units. *Journal of Advanced Nursing*, *69*(10), 2196-205.

29.   Siegel, E. O., Anderson, R. A., Calkin, J., Chu, C. H., Corazzini, K. N., Dellefield, M. E. and Goodman, C. (2012). Supporting and promoting personhood in long term care settings: Contextual factors. *International Journal of Older People Nursing*, *7*(4), 295-302.

30.   Jones, T. L., Hamilton, P. and Murry, N. (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *International Journal of Nursing Studies*, *52*(6), 1121-1137.

31.   Kalisch, B. J., Tschannen, D. and Lee, K. H. (2012). Missed nursing care, staffing, and patient falls. *Journal of Nursing Care Quality*, *27*(1), 6-12.

32.   Nelson, S. T. and Flynn, L. (2015). Relationship between missed care and urinary tract infections in nursing homes. *Geriatric Nursing*, *36*(2), 126-130.

33.   Zúñiga, F., Ausserhofer, D., Serdaly, C., Bassal, C., De Geest, S. and Schwendimann, R. (2013). *[Survey of care workers in Swiss nursing homes - final report]* Basel: Universität Basel. Retrieved from http://nursing.unibas.ch/shurp

34.   Jaccard Ruedin, H. and Widmer, M. (2010). *Ausländisches Gesundheitspersonal in der Schweiz (Obsan Bericht 39)*. Neuchâtel: Schweizerisches Gesundheitsobservatorium.

35.   Schweizerisches Gesundheitsobservatorium. (2009). *Gesundheitspersonal in der Schweiz - Bestandesaufnahme und Perspektiven bis 2020*. Neuchâtel: Schweizerisches Gesundheitsobservatorium, Bundesamt für Statistik.

36.   Cowden, T., Cummings, G. and Profetto-McGrath, J. (2011). Leadership practices and staff nurses' intent to stay: A systematic review. *Journal of Nursing Management*, *19*(4), 461-77.

37.   Jeon, Y.-H., Merlyn, T. and Chenoweth, L. (2010). Leadership and management in the aged care sector: A narrative synthesis. *Australasian Journal on Ageing*, *29*(2), 54-60.

38.   Choi, J. and Johantgen, M. (2012). The importance of supervision in retention of CNAs. *Research in Nursing & Health*, *35*(2), 187-99.

39.   McGilton, K. S., Tourangeau, A., Kavcic, C. and Wodchis, W. P. (2013). Determinants of regulated nurses' intention to stay in long-term care homes. *Journal of Nursing Management*, *21*(5), 771-781.

40.   Karantzas, G. C., Mellor, D., McCabe, M. P., Davison, T. E., Beaton, P. and Mrkic, D. (2012). Intentions to quit work among care staff working in the aged care sector. *Gerontologist*, *52*(4), 506-516.

41.   Anderson, R. A., Corazzini, K. N. and McDaniel Jr, R. R. (2004). Complexity science and the dynamics of climate and communication: Reducing nursing home turnover. *Gerontologist*, *44*(3), 378-88.

42.   Harvath, T. A., Swafford, K., Smith, K., Miller, L. L., Volpin, M., Sexson, K., White, D. and Young, H. A. (2008). Enhancing nursing leadership in long-term care. A review of the literature. *Research in Gerontological Nursing*, *1*(3), 187-96.

43.   Donabedian, A. (1988). The quality of care: How can it be assessed? *Journal of the American Medical Association*, *260*(12), 1743-1748.

44.   Mitchell, P. H., Ferketich, S. and Jennings, B. M. (1998). Quality health outcomes model. American Academy of Nursing Expert Panel on Quality Health Care. *Image: Journal of Nursing Scholarship*, *30*(1), 43-6.

45.   Mitchell, P. H. and Lang, N. M. (2004). Framing the problem of measuring and improving healthcare quality: Has the Quality Health Outcomes Model been useful? *Medical Care*, *42*(2 Suppl), II4-11.

46.   Meadows, D. H. (2008). *Thinking in systems. A primer*. White River Junction, VT: Chelsea Green Publishing.

47.   Cilliers, P. (1998). *Complexity & postmodernism. Understanding complex systems*. London: Routledge.

48.   Maguire, S., McKelvey, B., Mirabeau, L. and Öztas, N. (2006). Complexity science and organization studies. In Clegg, S. R., Hardy, C., Lawrence, T. B. and Nord, W. R. (Eds.), *The SAGE handbook of organization studies* (2nd ed.). London: SAGE.

49.   Simpson, K. M., Porter, K., McConnell, E. S., Colon-Emeric, C., Daily, K. A., Stalzer, A. and Anderson, R. A. (2013). Tool for evaluating research implementation challenges: A sense-making protocol for addressing implementation challenges in complex research settings. *Implementation science*, *8*, 2.

50.   Anderson, R. A. and McDaniel Jr, R. R. (2008). Taking complexity science seriously: New research, new methods. In Lindberg, C., Nash, S. and Lindberg, C. (Eds.), *On the edge: Nursing in the age of complexity*. Washington, D.C.: PlexusPress.

51.   Anderson, R. A., Toles, M. P., Corazzini, K., McDaniel, R. R. and Colon-Emeric, C. (2014). Local interaction strategies and capacity for better care in nursing homes: A multiple case study. *BMC Health Services Research*, *14*, 244.

52.   Podsakoff, P. M., MacKenzie, S. B. and Podsakoff, N. P. (2012). Sources of method bias in Social Science research and recommendations on how to control it. *Annual Review of Psychology*, *63*(1), 539-569.

53.   Van Bogaert, P., Timmermans, O., Weeks, S. M., van Heusden, D., Wouters, K. and Franck, E. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events--a cross-sectional survey. *International Journal of Nursing Studies*, *51*(8), 1123-34.

54.   Harahan, M. F., Sanders, A., Stone, R. I., Bowers, B. J., Nolet, K. A., Krause, M. R. and Gilmore, A. L. (2011). Implementation and Evaluation of LVN LEAD. A leadership and supervisory training program for nursing home charge nurses. *Journal of Gerontological Nursing*, *37*(6), 26-33.

55.   Cummings, G., Mallidou, A. A., Masaoud, E., Kumbamu, A., Schalm, C., Spence Laschinger, H. K. and Estabrooks, C. A. (2014). On becoming a coach: A pilot intervention study with managers in long-term care. *Health Care Management Review*, *39*(3), 198-209.

56.   Morgan, J. C. and Konrad, T. R. (2008). A mixed-method evaluation of a workforce development intervention for nursing assistants in nursing homes: The case of WIN A STEP UP. *Gerontologist*, *48*, 71-79.

57.   Colon-Emeric, C. S., McConnell, E., Pinheiro, S. O., Corazzini, K., Porter, K., Earp, K. M., Landerman, L., Beales, J., Lipscomb, J., Hancock, K. and Anderson, R. A. (2013). CONNECT for better fall prevention in nursing homes: Results from a pilot intervention study. *Journal of the American Geriatrics Society*, *61*(12), 2150-9.

58.   Howe, E. E. (2014). Empowering certified nurse's aides to improve quality of work life through a team communication program. *Geriatric Nursing*, *35*(2), 132-6.

59.   Jeon, Y. H., Simpson, J. M., Li, Z., Cunich, M. M., Thomas, T. H., Chenoweth, L. and Kendig, H. L. (2015). Cluster randomized controlled trial of an aged care specific leadership and management program to improve work environment, staff turnover, and care quality. *Journal of the American Medical Directors Association*, *16*(7), 629 e19-629 e28.

60.   OECD/European Commission. (2013). *A good life in old age? Monitoring and improving quality in long-term care*. OECD Health Policy Studies, OECD Publishing.

61.   Brownie, S. and Nancarrow, S. (2013). Effects of person-centered care on residents and staff in aged-care facilities: A systematic review. *Clinical Interventions in Aging*, *8*, 1-10.

62.   Kolanowski, A., Van Haitsma, K., Penrod, J., Hill, N. and Yevchak, A. (2015). "Wish we would have known that!" Communication breakdown impedes person-centered care. *Gerontologist*, *55*(Suppl 1), S50-60.

63. Li, J. and Porock, D. (2014). Resident outcomes of person-centered care in long-term care: A narrative review of interventional research. *International Journal of Nursing Studies*, *51*(10), 1395-415.

64. Wallerstedt, S. M., Kindblom, J. M., Nylen, K., Samuelsson, O. and Strandell, A. (2014). Medication reviews for nursing home residents to reduce mortality and hospitalisation: Systematic review and meta-analysis. *British Journal of Clinical Pharmacology*, *78*(3), 488-97.

65. Rantz, M. J., Alexander, G., Galambos, C., Vogelsmeier, A., Popejoy, L., Flesner, M., Lueckenotte, A., Crecelius, C., Zwygart-Stauffacher, M. and Koopman, R. J. (2014). Initiative to test a multidisciplinary model with advanced practice nurses to reduce avoidable hospitalizations among nursing facility residents. *Journal of Nursing Care Quality*, *29*(1), 1-8.

66. Ouslander, J. G., Bonner, A., Herndon, L. and Shutes, J. (2014). The interventions to reduce acute care transfers (INTERACT) quality improvement program: An overview for medical directors and primary care clinicians in long term care. *Journal of the American Medical Directors Association*, *15*(3), 162-70.

67. Reid, R. C., Cummings, G. E., Cooper, S. L., Abel, S. L., Bissell, L. J., Estabrooks, C. A., Rowe, B. H., Wagg, A., Norton, P. G., Ertel, M. and Cummings, G. G. (2013). The Older Persons' Transitions in Care (OPTIC) study: Pilot testing of the transition tracking tool. *BMC Health Services Research*, *13*, 515.

68. Chhabra, P. T., Rattinger, G. B., Dutcher, S. K., Hare, M. E., Parsons, K. L. and Zuckerman, I. H. (2012). Medication reconciliation during the transition to and from long-term care settings: A systematic review. *Research in Social and Administrative Pharmacy*, *8*(1), 60-75.

69. Verbeek, H., Meyer, G., Leino-Kilpi, H., Zabalegui, A., Hallberg, I. R., Saks, K., Soto, M. E., Challis, D., Sauerland, D., Hamers, J. P. and RightTimePlaceCare, C. (2012). A European study investigating patterns of transition from home care towards institutional dementia care: The protocol of a RightTimePlaceCare study. *BMC Public Health*, *12*, 68.

70. Graf, E., Cignacco, E., Zimmermann, K. and Zúñiga, F. (2015). Affective organizational commitment in Swiss nursing homes: A cross-sectional study. *Gerontologist*, (Advance online publication).

71. Zúñiga, F., Ausserhofer, D., Hamers, J. P. H., Engberg, S., Simon, M. and Schwendimann, R. (2015). Are staffing, work environment, work stressors, and rationing of care related to care workers' perception of quality of care? A cross-sectional study. *Journal of the American Medical Directors Association*, (Advance online publication).

72. Zúñiga, F., Ausserhofer, D., Hamers, J. P. H., Engberg, S., Simon, M. and Schwendimann, R. (2015). The relationship of staffing and work environment with implicit rationing of nursing care in Swiss nursing homes – A cross-sectional study. *International Journal of Nursing Studies*, (Advance online publication).

73. Weaver, S. J., Dy, S. M. and Rosen, M. A. (2014). Team-training in healthcare: A narrative synthesis of the literature. *BMJ Quality & Safety*, *23*(5), 359-372.

74. Xyrichis, A. and Ream, E. (2008). Teamwork: A concept analysis. *Journal of Advanced Nursing*, *61*(2), 232-41.

75. Anderson, R. A., Corazzini, K., Porter, K., Daily, K., McDaniel, R. R., Jr. and Colon-Emeric, C. (2012). CONNECT for quality: Protocol of a cluster randomized controlled trial to improve fall prevention in nursing homes. *Implementation Science*, *7*, 11.

76. Vogelsmeier, A. and Scott-Cawiezell, J. (2007). A just culture: The role of nursing leadership. *Journal of Nursing Care Quality*, *22*(3), 210-212.

77. Winsvold Prang, I. and Jelsness-Jorgensen, L. P. (2014). Should I report? A qualitative study of barriers to incident reporting among nurses working in nursing homes. *Geriatric Nursing*, *35*(6), 441-7.

78. Zúñiga, F., Ausserhofer, D. and Schwendimann, R. (2013). [Learning from critical incidents in nursing homes]. *Krankenpflege. Soins Infirmiers*, *106*(5), 30-1.

79. Pronovost, P. J., Holzmueller, C. G., Martinez, E., Cafeo, C. L., Hunt, D., Dickson, C., Awad, M. and Makary, M. A. (2006). A practical tool to learn from defects in patient care. *Joint Commission Journal on Quality and Patient Safety*, *32*(2), 102-8.

80. Taylor-Adams, S. and Vincent, C. (2007). *Systemanalyse klinischer Zwischenfälle. Das London-Protokoll*. Zürich: Stiftung für Patientensicherheit. Retrieved from http://www.patientensicherheit.ch/de/themen/Aus-Fehlern-lernen---Meldesysteme/ERA.html

81. Frankel, A., Grillo, S. P., Pittman, M., Thomas, E. J., Horowitz, L., Page, M. and Sexton, B. (2008). Revealing and resolving patient safety defects: The impact of leadership WalkRounds on frontline caregiver assessments of patient safety. *Health Services Research*, *43*(6), 2050-66.

82. Greene, S. B., Williams, C. E., Pierson, S., Hansen, R. A. and Carey, T. S. (2010). Medication error reporting in nursing homes: Identifying targets for patient safety improvement. *Quality and Safety in Health Care*, *19*(3), 218-22.

83. Nies, H., Leichsenring, K. and Mak, S. (2013). The emerging identity of long-term care systems in Europe. In Leichsenring, K., Billings, J. and Nies, H. (Eds.), *Long-term care in Europe. Improving policy and practice*. Basingstoke, UK: Palgrave Macmillan.