University of Basel

Faculty of Medicine
Department of Public Health

Pflegewissenschaft
Nursing Science

THE SIGNIFICANCE OF THE PSYCHOSOCIAL WORK ENVIRONMENT FOR CARE WORKERS` PERCEIVED HEALTH, PRESENTEEISM, RATIONING OF CARE, AND JOB SATISFACTION: A SUB-STUDY OF THE SWISS NURSING HOME HUMAN RESOURCES PROJECT (SHURP)

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LIST OF ABBREVIATIONS

ADL	Activities of Daily Living
BBF	Blood and Body Fluid
BERNCA-NH	Basel Extent of Rationing of Nursing Care - Nursing Home Version
β	Beta Coefficient
CNA	Certified Nursing Assistant
COBB	Fragebogen zur Erfassung von affektiven, kalkulatorischem und normativem, **C**ommitment`gegenüber der **O**rganisation, dem **B**eruf/der Tätigkeit und der **B**eschäftigungsform
CI	Confidence Interval
DRG	Diagnostic Related Group
EU-OSHA	European Agency for Safety and Health at Work
GEE	Generalized estimation equations
HPSI	health Professions Stress Inventory
I-CVI	Item Content Validity Index
IOM	Institute of Medicine
LPN	Licensed Practical Nurse
MBI	Maslach Burnout Inventory
NA	Nurse Aide
OR	Odds Ratio
OSHA	Occupational Safety and Health Administration
PES-NWI	Practice Environment Scale-Nursing Work Index
RN	Registered Nurse
SAQ	Safety Attitude Questionnaire
S-CVI	Scale Content Validity Index
SHURP	Swiss Nursing Home Human Resources Project
WHO	World Health Organization

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PREFACE

This dissertation thesis is imbedded in the multicenter cross-sectional Swiss Nursing Homes Human Resources Project (SHURP) using care workers and organizational survey data. SHURP is a research project that proposed to bring a better understanding of the structural and organizational conditions, care workers characteristics, and that of residents, in the Swiss nursing homes. The SHURP project with focus on institutional long-term care is in the tradition of nurse outcomes studies such as the international Nurse Forecasting: Human Resources Planning in Nursing (RN4CAST) project. SHURP was led by the Institute of Nursing Science (INS) at the University of Basel and has focused on care workers in Swiss nursing homes.

The demographic development of Switzerland, with high life expectancy and a growing number of older people, will increase future demands for support and care services. It is projected that the number of elderly placed in nursing homes will further increase {Bayer-Oglesby L, 2010 #269}. So far, research in the last decade was devoted to the field of institutional care with different issues such as quality of care, work environment, and costs. Despite existing studies, the complex relationships and interactions between these different factors that determine ultimately the quality of care in nursing homes have not been studied comprehensively, particularly in Switzerland.

Of the 1,600 nursing homes across Switzerland, a representative sample of 163 nursing homes stratified according to the German, French, and Italian speaking regions and facility size have participated in the SHURP study conducted from 2011-2013 by the University of Basel's Institute of Nursing Science. To date, SHURP represents one of the largest nursing home workforce studies conducted in Switzerland, and internationally. It helped to gain an extended knowledge of the relationships between organizational structures, profiles of institutions, characteristics of care workers, and resident outcomes, to respond to pressing questions in long-term care.

By care worker surveys, as well as nursing home administrative and resident data, the SHURP team assembled and analysed data on a set of care worker-related organizational factors, including work environment (e.g. leadership, staffing adequacy, collaboration, workload, work stressors), care worker characteristics (e.g. educational level, professional nursing experience), self-reported care workers` outcomes (e.g. presenteeism, absenteeism, work related health, job satisfaction), perceived rationing of care, and residents outcomes (e.g. adverse events, hospitalizations), in addition to organizational characteristics (e.g. ownership status, staffing, occupancy rate). The resulting data enables modelling of work environment aspects to analyse how modifications might promote safety at the workplace in order to improve care workers outcomes and help meeting residents' needs through ensuring the provision of appropriate care. Subsequent studies not only enabled this dissertation project, but also added value to the SHURP project, as it allowed us to illuminate this important issue on a national level for the first time.

SUMMARY

Healthcare is a high-risk industry, not only for patients, but also for staff, whose health and wellbeing can be affected. While research has extensively examined the health of care workers in hospital settings [1-3], nursing homes have been less researched in this regard. Nursing homes are an important sector of the care system that is becoming increasingly complex with the growing elderly population. In Switzerland, with the introduction of Diagnostic Related Group (DRG) with reduced length of hospital stay and accelerated patient discharge [4], nursing homes are delivering more sub-acute care to residents with complex medical conditions. More than half of residents in Swiss nursing homes are diagnosed with dementia or show signs of dementia, and require assistance to meet basic needs in activities of daily living [5]. Consequently, nursing home care workers often perform nursing activities such as patient handling and positioning, and communicating with challenging residents that put them at risk of physical injuries and compromised mental health. A particular concern is presenteeism, which refers to attending to work while ill, and which showed to be common among care workers [6].

Workplace environments in health care settings have shown to be with risks for staff health, e.g. for musculoskeletal injuries [7] and needle stick injuries [8]. Researchers also found increased rates of emotional exhaustion [9] and musculoskeletal pain among direct care providers [10]. Job demands at work were found strong factors in contributing to increased injury rates [11]. Mental health outcomes were positively influenced by social support at work [9]. While the magnitude of the problem of care workers working through illness and its ramification on the provision of care in nursing homes has not been fully identified so far, researchers recognize its effect on the quality of care [12].

This dissertation aims to explore care workers` reported physical and mental health in Swiss nursing homes, analysed relationships with contributing factors (e.g. psychosocial work environment factors) and outcomes (e.g. rationing of residents care and job satisfaction) in four studies. These studies analyse data from the Swiss Nursing Homes Human Resource Project (SHURP), including survey responses from a survey of 5,323 care workers in 162 Swiss nursing homes, across the three language speaking regions (German, French, and Italian) [13].

The dissertation is organized in six **chapters:**

Chapter 1 is an overall literature-based introduction to the topic. It explores the association of the work environment and care worker's health. Emphasis is placed on nursing home care workers, and the importance of their perception of work environment factors, including, but not limited to, leadership, staffing adequacy, work stressors, and autonomy at work, and how they influence care workers related behaviour (e.g. presenteeism, absenteeism). The influence of care workers` health on rationing of care, and the relationship between health and work environment with care

workers` job satisfaction, are also discussed. An overview of the state of research on care workers` health in nursing homes and the conceptual framework of this dissertation is presented. In the final part of the introduction, gaps in the literature are summarized, along with the contribution of this dissertation to address those gaps. Aims and rationale of the dissertation are described. Findings addressed in four component studies are reported (**Chapter 2** to **Chapter 5**).

Chapter 2 reports on our study describing care workers` perceived health, exploring relationships between selected perceived work environment factors and self-reported physical and mental health outcomes. In this sample of 3,471 care workers from 155 nursing homes across Switzerland, 38% reported at least one compromised physical health outcome, and 27.4% reported at least one mental health outcome. Back pain (19.0 %, n=655), and joint pain (13.5%, n=464) were reported physical health outcomes. Emotional exhaustion (24.2%, n=834), tiredness (14.4%, n=494), sleeplessness (12.6%, n=432) were the most prevalent self-reported mental health outcomes. After controlling for major organizational variables and care workers` characteristics, percentage of residents with dementia, physical violence and participation in decision-making were not predictors of health outcomes in our regression models. However, back pain and joint pain were associated with increased workload, conflict with other professionals and lack of recognition, frequent verbal aggression by residents, and perceived poor staffing adequacy. Sleeplessness, tiredness, headache, and emotional exhaustion from work, were associated with stress related to increased workload and conflict with other professionals and lack of recognition. Perceptions of strong leadership were associated with low-reported emotional exhaustion. Overall, our findings confirmed that poor psychosocial work environmental factors in nursing homes were related to the perceived physical and mental health of care workers. Modifying psychosocial work environment factors in Swiss nursing homes is a promising strategy to improve the health of their staff.

Chapter 3 presents the results of our explorative study of the prevalence of presenteeism and absenteeism in Swiss nursing homes, and their associations with care worker-reported selected psychosocial work environment factors. Of the studied 3,176 care workers in 162 nursing homes, prevalence of presenteeism (32.9%) was higher than absenteeism (14.6%). Although self-reported absenteeism showed no significant association with any of the psychosocial work environment factors investigated in this study, low reported presenteeism was associated with perceptions of supportive leadership (OR 1.22, CI 1.01-1.48), and adequate staffing resources (OR 1.18, CI 1.02-1.38) only. The findings suggest that presenteeism is an area that has been overlooked in nursing homes. Hence, it is reasonable to focus on presenteeism in order to promote care workers` health and to promote productivity and sustain the organization. Future analysis is needed to investigate the influence of presenteeism on the provision of residents care.

Chapter 4 presents study findings on the association between care workers-reported health, presenteeism and perceived implicit rationing of care. Studies showed that the exposure to an

unhealthy workplace can compromise care workers physical and mental health. As the WHO Model for Healthy Workplace suggests, ill employees who work through illness have reduced work performance. Work performance can be assessed through omission rates in relation to required tasks. Care providers often reported implicit rationing of care (i.e. omission of care) due to various limitations. Of the 3,239 participating care workers in 162 nursing homes, physical and mental health issues, and presenteeism were of concern, and rationing of care was reported as rare. Our findings give support to the sensitivity of rationing of care to health issues: For rationing of activities of daily living, our regression model showed a positive association with perceived health: joint pain (β 0.04, CI 0.001-0.07), emotional exhaustion (β 0.11, CI 0.07-0.15), and presenteeism (β 0.05, CI 0.004-0.09). For rationing of caring, rehabilitation, and monitoring, results were similar: joint pain (β 0.05, CI 0.01-0.09), and emotional exhaustion (β 0.2, CI 1.16-0.24). Health organizations should be aware of health-related issues at the workplace to promote and maintain care workers` health, in order to ensure resident safety and appropriate provision of care. Further observational studies are needed to gain a deeper understanding of the individual decision of care workers for presenteeism and its' impact on work performance, which may ultimately impact quality of care.

Chapter 5 presents major findings on care workers` job satisfaction and its association with work environment factors and perceived health. Recruiting and retaining care workers to meet the challenges of a growing elder population are connected to the satisfaction of care workers in the workplace. The conceptual analysis of job satisfaction showed that this affective response behaviour is not only linked to personal characteristics but also to one`s desired and expected outcomes. Hence, this study investigated the influence of work environmental aspects and perceived health on 4,145 care workers in 162 Swiss nursing homes. Results showed that high job satisfaction was associated with perceived supportive leadership (OR 3.76; CI 2.83-5.00), enhanced teamwork and resident safety climate (OR 2.60; CI 2.01-3.33), the availability of nursing home director (OR 2.30; CI 1.67-2.97), and staffing adequacy (OR 1.40; CI 1.15-1.70). However, it was reduced in the presence of workplace conflict (OR 0.61; CI .49-.76), compromised physical health (OR 0.91; CI 0.87-0.97), and emotional strain (OR 0.88; CI 0.83-0.93). To retain care workers and recruit new ones, nursing homes should modify substantial work environment (e.g. leadership and staffing adequacy) aspects in order to promote job satisfaction among their staff. Future longitudinal research is needed to confirm the observations made in this cross-sectional study design.

Finally, in **Chapter 6** major findings of the individual studies are synthesized and discussed, substantive theoretical findings are stressed, and methodological strengths and limitations of this dissertation are presented. Moreover, implications for further research and clinical practice are recommended. The findings of this dissertation add to the existing literature the first evidence regarding the impact of health and presenteeism on rationing of care. Our findings confirm the underlying theoretical assumption that safer work environment is a protective aspect of care workers`

health and wellbeing. Although these findings suggest the need to improve work environment and care workers` health in Swiss nursing homes to ensure better provision of resident care, it remains unclear whether improving care workers` health will lead to improved quality of care. This dissertation will contribute to the further development of healthy workplaces and their relationship to job performance and quality of care, and raises methodological issues that will require considerations in future studies.

References

1. Stefanati, A., et al., [A survey on injuries among nurses and nursing students: a descriptive epidemiologic analysis between 2002 and 2012 at a University Hospital]. Med Lav, 2015. 106(3): p. 216-29.
2. Sezgin, D. and M.N. Esin, Predisposing factors for musculoskeletal symptoms in intensive care unit nurses. Int Nurs Rev, 2015. 62(1): p. 92-101.
3. Taghinejad, H., et al., Occupational mental health: A study of work-related mental health among clinical nurses. J Clin Diagn Res, 2014. 8(9): p. Wc01-3.
4. Widmer, R., INTERIM RESULT : HOW DOES THE INTRODUCTION OF SwissDRG TO LONG-TERM CARE OFF. 2013, CURAVIVA: Switzerland.
5. Zuniga F, et al., Rapport final de l`enquete relative au personnel de soins et d`accompagnement dans les établissments-médico-sociaux en Suisse. 2013, Institute of Nursing Science-University of Basel: Basel.
6. Szymczak, J.E., et al., Reasons Why Physicians and Advanced Practice Clinicians Work While Sick: A Mixed-Methods Analysis. JAMA Pediatr, 2015.
7. Bernal, D., et al., Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: A systematic review and meta-analysis. Int J Nurs Stud, 2015. 52(2): p. 635-648.
8. Rohde, K.A., et al., Minimizing nurses' risks for needlestick injuries in the hospital setting. Workplace Health Saf, 2013. 61(5): p. 197-202.
9. Willemse, B.M., et al., The moderating role of decision authority and coworker- and supervisor support on the impact of job demands in nursing homes: a cross-sectional study. Int J Nurs Stud, 2012. 49(7): p. 822-33.
10. D'Arcy, L.P., Y. Sasai, and S.C. Stearns, Do assistive devices, training, and workload affect injury incidence? Prevention efforts by nursing homes and back injuries among nursing assistants. Journal of Advanced Nursing, 2012. 68(4): p. 836-845.
11. Qin, J., Kurowski, A., Gore, R., & Punnett, L. (2014). The impact of workplace factors on filing of workers' compensation claims among nursing home workers. BMC Musculoskelet Disord, 15(29), 2-9. doi: 10.1186/1471-2474-15-29
12. Letvak, S. and C.J. Ruhm, The impact of worker health on long term care: implications for nursing managers. Geriatr Nurs, 2010. 31(3): p. 165-9.
13. Schwendimann, R., et al., Swiss Nursing Homes Human Resources Project (SHURP) protocol of an observational study. J Adv Nurs, 2013. 70(4): p. 915-926.

CHAPTER 1

INTRODUCTION

Health care is one of the high-risk industries for its employees. In 2014, the European Agency for Safety and Health at Work (EU-OSHA) confirmed that healthcare workers having the fourth highest rate of work-related health problems, just behind Manufacturing and Construction [1]. In the same line, the US healthcare sector is ranking with Transportation and Construction in non-fatal injury rates among its workforce [2]. With no exception, Switzerland (2012) reported similar rates of work related injuries per 100 full-time workers in Transportation (3.1), Construction (3.3), and Health sector (3.1) [3]. In the health sector, more than half of the workforce is employed in hospitals and nursing homes [4].

Nursing homes are a major component of long-term care provision in developed countries. They operate 24 hours a day, 7 days a week, and 365 days a year, and often deal with issues of life and death. Nursing homes face challenges, with the growing number of older people and the introduction of DRG, as the length of hospital stay for patients has diminished and the discharge accelerated [5]. Furthermore, according to the WHO (2012), approximately one third to one half of all people who develop dementia will live in nursing homes [6]. In Switzerland, over 50% of residents living in nursing homes are diagnosed with dementia or show the respective symptoms, and require assistance to meet their basic needs [7]. Consequently, nursing homes deliver sub-acute care that previously would have been provided in the hospital setting. Care services include rehabilitative and palliative care to residents who can no longer sustain safely the basic activities of daily living in their homes. As a result, professional care in nursing homes has become demanding due to high physical workloads [8] and constant mental judgment to manage the needs of complex and fragile people [1]. Nursing home care workers (e.g. registered nurses, licensed practical nurses, certified nursing assistants, nurse aides) perform various physical tasks that are particularly strenuous, such as lifting, positioning, transferring residents, and working in awkward postures, which put them at risk for injuries [9, 10]. In addition to physical strain and injuries, nurses are also at risk of mental health problems, such as burnout and symptoms of depression [11] concomitant with the intensive nature of labor and patient care. Although substantial research showed that emotional stress and mental health illness are common problems among hospital care workers [12], little is known about the magnitude of the problem in nursing homes.

Over the past two decades, care workers` safety has become a major area of interest in the occupational health community. Several national and international organizations such as the Institute of Medicine (IOM) [13], the World health Organization [14], the European Agency for Safety and Health at Work (EU-OSHA) [1], the Occupational Safety and Health Administration [10], and the National Institute for Occupational Safety and Health (NIOSH) [15] have provided evidence that implementation of prevention programs, education, and strengthening the inspection bodies can significantly reduce work-related injuries based on continuous research initiatives. There are ongoing discussions on how to achieve a safer healthcare system not only for patients, but also for its

workforce too in order to reach a better quality care [1]. Accordingly, the focus on care workers health has increased tremendously [16-18].

Despite these focused research and initiatives, the question remains whether the new guidelines and programs implementation have also increased the ability to reduce work related injuries and mental health illnesses. We have learned that despite many investments and improvements [19, 20], the healthcare system is a complex and dynamic environment, which makes it hard to sustain a high level of safety and injury-free environment. The promotion of care workers` health is multidimensional and includes several factors such as physical and psychosocial work environment conditions, personal health resources, and physical and social environment of the broader community [14]. Reducing the incidents of injuries requires more than just the implementation of an isolated program, as it may have ramifications on care workers, as well as on the provision of care, and eventually on quality care [21]. In this sense, this dissertation sheds the light on several gaps in the research of nursing home care workers` health, and offers one course of many in the direction of increasing their safety and wellbeing.

1.1 Work related health among care workers: the magnitude of the problem

Working in the health sector and providing bed-side care entails dealing with a wide range of activities and environments that pose a threat to care workers` health and puts them at risk of work-related injuries and illnesses. Healthcare workers are exposed to a large number of concomitant risks such as biological hazards (e.g. infections caused by needle stick injuries), chemical hazards (e.g. toxic drug agents), ergonomic hazards (e.g. manual handling of patients), and psychosocial hazards (e.g. violence against care workers) [1, 14]. The literature has identified physical and mental health illnesses related to workplaces as follows.

Physical health

"*The adult human form is an awkward burden to lift or carry. Weighing up to 100kg or more, it has no handles, it is not rigid, and it is liable to severe damage if mishandled or dropped. In bed a patient is placed inconveniently for lifting, and the placing of a load in such a situation would be tolerated by few industrial workers"* [22].

The substance of this quote has not changed fifty years later; nurses still handle patients in beds and thus, continue to suffer from musculoskeletal injuries [23]. Work related musculoskeletal injuries include problems in, but not limited to, the muscles, tendons, and joint nerves, with or without tissue degeneration [24]. They are characterized by the feeling of pain, numbness, and/or heaviness. These injuries could affect different areas of the body, such as superior and inferior limbs, back, shoulder, and cervical region [24]. In nursing homes, elder residents depend on the healthcare

provider in meeting their daily needs such as bathing, toileting, and repositioning [19]. As a result, movements including manual handling of residents (e.g. heavy lifting, frequent repositioning), awkward body postures in performing daily tasks (e.g. bending, kneeling), transferring residents from one place to another, and applying excessive forces while moving objects. In addition to lack of time for recovery and speed of movement, were all associated with musculoskeletal disorders [1, 25, 26]. Several countries have ranked nursing home care workers, particularly frontline providers, among workers with the highest incidence of back injuries [27] [28] [23] [29].

Moreover, care workers are at risk of sharp object injuries (e.g. needle stick injuries) while performing their routine tasks, which were recognized as work-related health hazards [1, 30]. Sharp object injuries place the nursing personnel at serious risk when exposed to blood and body fluids (BBF) [30]. With exposure to BBF, approximately sixty pathogens are at risk to be transmitted, including viruses, bacteria, parasites and yeasts, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency viruses (HIV) [1, 30, 31]. Most reported needle stick injuries occurred in the hospital settings [32-34]. Less is known about exposures in long-term facilities [35]. For example, during the parenteral exposure with a contaminated sharp object, the risk of infection with HIV, HCV, and HBV, is 0.3%, 1.8%, and 30%, respectively [36]. Although research on sharp object injuries focus on nursing personnel, most investigations on needle stick injury rates and trends are not generalizable to other healthcare settings like nursing homes [30].

Some needle stick injuries go unreported by nurses [32, 35], which likely means that previous research underestimated the magnitude of the problem. Not reporting injuries was linked to embarrassment, lack of time, hesitancy to admit lack of knowledge on how to handle instruments, and not knowing how and where to report [31].

Mental Health

In connection to dealing with highly care dependent residents, nursing home healthcare workers face many difficult and potentially stressful situations [37]. With the increasing number of aged people with dementia, elder care will continue to pose a challenge on industrialized countries in the upcoming years. Researchers observed that nursing care, including managing challenging behaviours and cognitively impaired residents, can induce psychological stress [38, 39], emotional fatigue [1], and increases the risk for burnout [40]. In addition to physical strain, care situations often requires high psychological demands, which includes frequent advanced communication skills, and time dedication [17]. Feeling angry, tense, nervous, stressed, not able to cope, not able to sleep, feeling tired and emotionally and/or physically exhausted, were all reported by nursing home care workers to describe their psychological stress and mental health in the provision of care [38, 40]. Psychological stress can take the form of emotional exhaustion or burnout. Maslach (2001) defined

burnout as "*a response to chronic interpersonal stressors on the job*" and comprised emotional exhaustion- the depletion of one's emotional and physical resources [41].

A recent study in France revealed that over 30% of nurses working in nursing homes reported compromised mental health [37]. Trends show that work-related mental health issues among nursing home care workers is on the rise [37, 38, 42]. Compromised mental health among care workers poses a number of problems for the professionals, the patients/residents, and the organization in which they work, such as absenteeism [43], lower patient/resident safety [44], intention to leave [45], and higher turnover rates [46]. The problem of staff turnover and shortage causes additional challenges beside patient safety, such as the economic costs in recruiting and training new personnel [46].

It is an ethical, moral, and legal obligation for employers to provide safe workplaces that do not cause any type of harm to their staff, and to prevent burnout and emotional exhaustion, among other health illnesses, from happening [47]. Consequently, the prevention of work related health problems should be the focus of risk management in healthcare settings [46]. However, this requires knowledge of the contributing factors. To date no comprehensive analysis of the situation in Swiss nursing homes is available.

1.2 Presenteeism: an emerging problem

The term presenteeism emerged in the 1990s by Professor Cary Cooper, Professor of Organizational Psychology and Health at Manchester University in the United Kingdom [48]. He used the term to describe over-work and feelings of job insecurity that result from corporate downsizing and restructuring. He did not initially link the term to going to work while ill. However, he indicated that those individuals who consistently worked long hours would eventually become sick. Presenteeism describes the loss of productivity from workers with legitimate health related problems, such as headaches, colds, and allergies [48]. Fifteen years ago, the definition of presenteeism evolved to describe the behavior of attending to work despite illness [49]. More recently in healthcare, presenteeism referred to *decreased job performance* [50] or *decreased work productivity* [21] due to illness, as a second indicator of productivity measurement [50], after absenteeism.

While absenteeism related to physical and mental illness gained a major emphasis in occupational health research due to its associated cost [51], presenteeism has begun to garner more interest from healthcare directors [50, 52]. Awareness to the subject relatively increased, when organizations realized that not only absenteeism drains productivity, but also presenteeism [53]. Empirical studies showed that presenteeism is common among healthcare workers regardless of the work setting [54, 55]. For example, in 2011, 49% of the Swedish public health sector workers (including hospitals and primary care) reported frequent presenteeism [56]. Internationally, the

prevalence of presenteeism ranged from 22% to 62% among European and US hospital workers [57-59].

Though in absenteeism, loss of productivity is 100% since workers` contribution is null, direct and indirect loss of productivity costs in presenteeism are not easy to estimate [60]. Attempts to quantify presenteeism rely solely on self-reports where respondents note when they had to turn up to work while ill. As a result, measuring the impact of presenteeism on productivity was complex, which made presenteeism a non-palpable phenomenon [61]. Subsequently, costs of presenteeism were associated with low work ability [62], errors on the job, reduced work output, and failure to meeting the organization standards and work expectations [63]. Productivity is an essential element for the sustainability of the organization [47]. Shedding the light on this measure is crucial especially when involving health professionals, due to the complex work obligations and the ramifications on interpersonal relationships and care delivery [64]. As a consequence, presenteeism can have a serious impact meeting residents` needs, since a nurse who remains on the job despite sick health may not entirely meet its exigencies [59].

Another issue is that presenteeism involves a two-fold behaviour: one comprises the legitimate sickness and the right to call in sick, and the second involves the decision to turn up to work despite being ill [57]. In this sense, the question arises as to what make(s) care workers attend to work despite illness. Although the increasing awareness of presenteeism losses are spiraling the demand for health promotion programs [65], existing studies to promote care workers` health and wellbeing in Europe and elsewhere [58, 66, 67] failed to explore comprehensively the second fold of presenteeism, particularly in nursing homes.

1.3 Determinants of work-related health and presenteeism

Traditionally, studies on risk factors for work-related physical injuries (e.g. musculoskeletal injuries) have focused on routine nursing tasks which involve manual resident handling and working long hours or working shiftwork [20, 25, 68-70]. However, the benefits from prevention programs such as training and accessibility to mechanical aides to reduce physical demands were not optimal in reducing musculoskeletal injuries [71-73]. More recently, mounting evidence showed that organizational factors play a role in the occurrence of work-related physical injuries [74-76].

Excessive use of the musculoskeletal system is influenced by inadequate work conditions: a mismatch between the requirement of the task and care workers` ability to perform these tasks are influenced by the characteristics of the work organization [24]. In nursing homes, positive and supportive organizational culture promoted a safe work environment with reduced injury rates. Psychosocial organizational factors included feeling supported, respected and valued by peers, and collaborating with colleagues [72]. Other factors, which increased self-reported injuries, were limited professional experience, poor training and job preparation, working overtime and doing shift work

[72]. Graham (2012) found that in an unfavourable work environment, care workers who suffered from musculoskeletal injuries reported poor interpersonal relationships and negative job perception [23]. The high prevalence of back injury is the major cause of absenteeism [77], and is reflected in nurses' placement among the highest of any professional healthcare group in their rates of manual handling injuries [78]. Job demands, low job control, and low social support have explained the high incidence of low back pain in hospital nurses [75].

Despite the fact that the relationship between psychosocial organizational factors and musculoskeletal injuries has been widely examined, most of these findings are not generalizable to all nursing home care workers, as they were limited to nurse aides [23, 72] and hospital care workers [75]. Furthermore, associations between those factors and work-related musculoskeletal injuries are confusing. The confusion lies to some extent in the lack of a standard definition of the psychosocial aspects of the job [9]. For example work stressors (e.g. job demands, role conflict, lack of control) and job strain (e.g. job dissatisfaction) were often pooled together [79], which make it difficult to evaluate their impact on reported injuries [9].

In addition to the risk of musculoskeletal injuries due to handling patients, the risk of cutting and piercing is high with handling sharp objects during patient care [31]. Empirical evidence showed similarities between some organizational determinants of musculoskeletal injuries and sharp injuries such as poor job training and little clinical skills [31, 32]. Sub-optimal compliance with safety standards (e.g. recapping) [31, 32] and cleaning instruments after usage were also incidents in which nurses reported injuries with sharp objects [80]. However, existing studies focused on hospital care workers and nursing students, and did not account for the risk among nursing home care workers.

On top of work-related physical injuries, healthcare workers are also at risk of compromised mental health. In particular, the nursing profession has long been known to be inherently demanding, causing emotional exhaustion and burnout [81]. Psychosomatic symptoms, such as sleeplessness and fatigue, were reported along with emotional exhaustion and burnout among care workers [82]. Previous research into professional emotional stress and burnout has shown that work environment aspects influence mental health [83]. The identification of protective factors became the centre of attention in emotional stress research due to their implications for personnel education and job restructure [81].

Although few studies have examined the relationship between the work environment aspects and emotional exhaustion in the nursing home setting, evidence has shown that high job demands, work autonomy [84], and job dissatisfaction [82] were contributing factors. In the provision of care for complex and challenging residents, the management has the influence on care workers` job satisfaction through greater leadership support and reduced occupational stress [38]. According to the Demand-Control-Support Model, the effect of job demands on one`s mental health is buffered when job control and social support at work are optimal [85]. For instance, in a German study on

nursing home care workers, an interaction between job control and job demands in relation to physical health complaints and emotional exhaustion was observed [86].

Apart from the job psychosocial characteristics and its potential impact on the health of care workers, several investigators found that resident violence toward healthcare workers resulted in high level of work-related stress and burnout [87]. The National Institute for Occupational Safety and Health defines workplace violence as "*violent acts, which include physical assaults and threats of assaults, directed toward persons at work or on duty"* [88]. Empirical research reveals that the prevalence rates of resident violent acts against care workers in US nursing homes are high [89]. Not enough time to assist residents with activities of daily living was reported as a trigger for the assault. Nurses who reported experiencing the assault, described feeling of emotional stress [89]. In an attempt to raise awareness and promote care workers safety and wellbeing, special guidelines for handling challenging behaviour for residents with dementia in nursing homes were published in 2007, entitled "*Guidelines for the Care of People with Dementia and Challenging Behavior*". However, violence against care workers is still high in nursing homes, and was linked to compromised physical and mental health [87].

As it relates to health, the importance of presenteeism relies primarily in its loss of productivity, which may exceed that of absenteeism [59]. Similar to physical and mental health, unfavourable psychosocial work environments were also linked to presenteeism [58]. Job demands [53] and ease of replacement [90] were correlates of presenteeism. The ability to work through illness depends on the person`s perception that fellow colleagues will not be able to compensate for his/her absence [58]. However, a previous study on hospital care workers showed that time pressure, and the inability to find a substitute, were not related to the decision to come to work while ill [91].

To date, results regarding organizational factors in relation to presenteeism do not explain its magnitude due to their low explanatory power [90]. This suggests that the field of presenteeism warrants further investigations. Other than studies examining the prevalence and circumstances of injuries, there is little research examining risk factors associated with injuries experienced by nursing home care workers, and knowledge about the impact of organizational factors on nursing home staff injuries is limited. There is a mounting body of evidence that endorses the creation of a "healthy" workplace environment in order to support healthcare providers, retain qualified personnel, and ultimately guarantee the delivery of optimal and safe quality of care [16, 47, 72]. Hence, knowing the contributors of presenteeism comprehensively help nursing directors and managers observe symptoms of presenteeism and modify working conditions in order to avoid any repercussions on job performance (e.g. rationing of care), and eventually quality of care.

1.4 Effect of health and presenteeism on rationing of care

Care workers` compromised health has a direct impact on the organization through loss of productivity [37]. For decades, productivity was measured by workplace absences due to illness [92]. However, with the emergence of presenteeism, there has been little research into how nurses' health and the level of productivity might relate to their ability to provide care [59]. Previously, Michie (2003) observed that care workers` poor health impact patients, in that both the quantity and the quality of care may be reduced [93]. More recently, nursing home staff who reported highest burnout and lowest general health, scored lowest on their ability to work [40]. Nursing productivity is often viewed as "*doing one`s work as carefully as usual, as measured by self-report"* [59], and assessed in relation to reduced work output, errors on the job, and failure to meet organization production standards [50]. In a study on physical and mental fatigue among nurses in relation to their performance [94], the survey assessed the frequency of nurses following existing organizational work standards in patient handling, modifying standards to get the work done, performing physical tasks (e.g. handling patients), patient monitoring, documentation, and/or communicating with patients or family members, and taking short-cuts in patient care. Findings showed that the higher the physical and the emotional fatigue, the lower the nursing performance [94]. In that, based on their assessments, nurses often make important decisions to leave certain tasks undone [95]. There have been previously numerous studies on the omission of nursing care, and three concepts were identified: 1) nursing care left undone [96], 2) missed nursing care [97], and 3) implicit rationing of care [98]. Despite the difference in operationalization, these three concepts refer to care workers` attempts in omitting partially or fully nursing activities during scarce resources (e.g. time pressure, shortage of staff) [95, 97] and physical and emotional fatigue [94].

Consequently, in a demanding work environment like the nursing home, it is important to know the most critical factor(s) that affect the decision of omission of care and subsequent nursing performance. As such, the role of compromised health of care workers and presenteeism in relation to implicit rationing of care must be clarified because nurses' role in providing the majority of direct patient care is closely tied to the quality and safety of care [99], and because studies have stressed that rationing of care is a correlate measure of nursing care quality [100].

1.5 The effect of work environment and health on job satisfaction

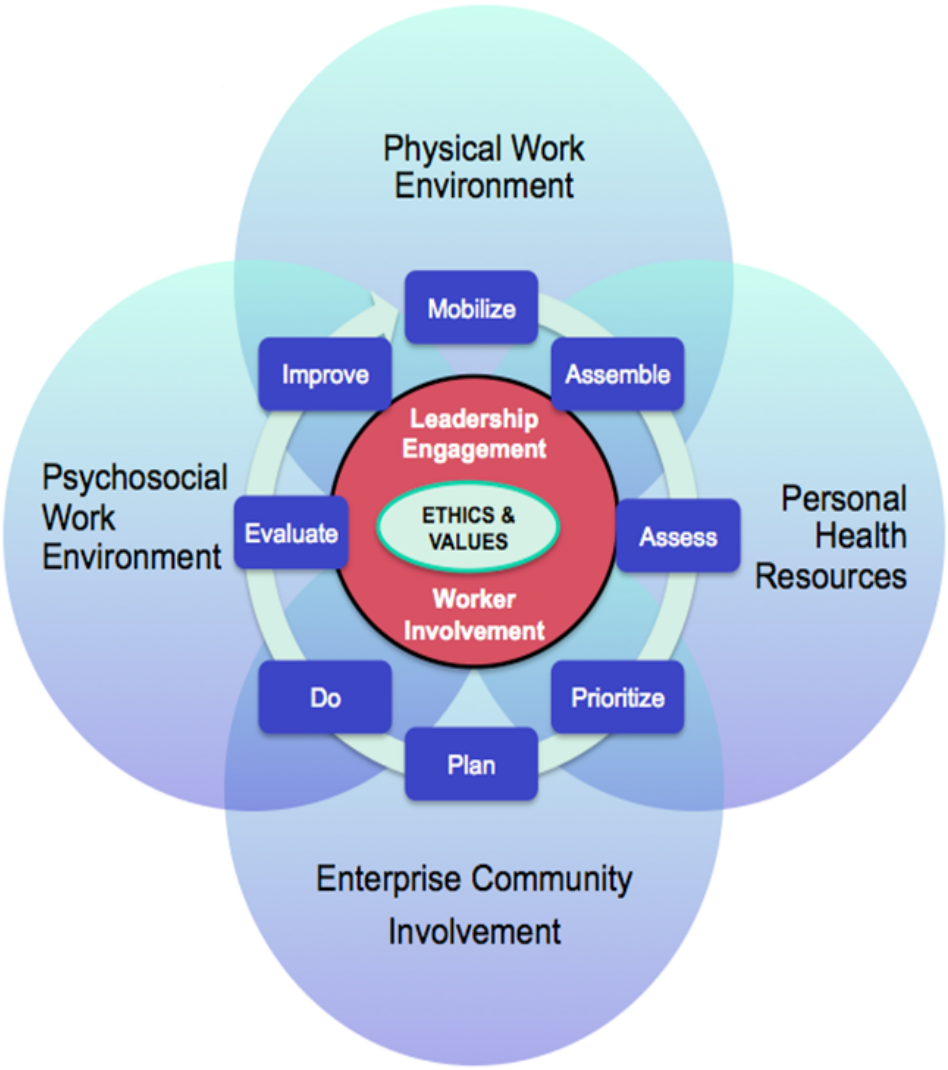
In the first half of the 21st century, the global population 60 years and over is expected to expand threefold to nearly two billions [101]. With this dramatic increase in elder population come the sharp increases in dementia [102, 103], and subsequently the upsurge need for dementia care. Hence the demand for nursing home care workers will amplify. Recruitment and retention are among the challenges that face long -term facilities to keep up with the pressing demands [104]. Numerous

factors have been linked to care workers` turnover; yet, job satisfaction is by far the most cited [105]. It is an affective reaction describing a *pleasure or emotional state resulting from the appraisal of one`s job experiences* [106]. Although several nursing homes offered some combination of retention programs, the majority of strategies did not have a significant association with the level of nursing retention [107]. Furthermore, not all dissatisfied care workers leave their work, but they might exhibit unreliable work ethic [108] and impact the quality of resident care delivered [109]. The determinants of job satisfaction for care workers may vary across health care systems [108]. Hence factors influencing hospital care workers` job satisfaction might not be generalizable to nursing home care workers. Despite the significance of job satisfaction, studies examining determinants of job satisfaction comprehensively are lacking in nursing homes [108].

1.6 The WHO Model for Healthy Workplace

For this dissertation thesis, we used the World Health Organisation Model for Healthy Workplace to guide our empirical examination (fig.1). The model represents the structure, content, processes and system of the healthy workplace concept. It includes both the content of the issues that should be addressed in a healthy workplace, grouped into four large “avenues of influence”, as well as the process for continual improvement that will ensure sustainability of healthy workplace initiatives [47]. Critical process aspects of the model include a step-by-step continual process of work environment involvement around a shared set of ethics and values [14].

Figure 1. The WHO Model of Healthy Workplace



As described by the model, the four key areas that can be influenced in healthy workplace initiatives are 1) the physical work environment hazards typically include chemicals, biological, and ergonomic hazards (e.g. processes requiring excessive force). These factors can affect workers` physical and mental health; 2) the psychosocial work environment refers to the organisational culture and daily practices that affect the mental and physical health of the workers. Workplace stressors are factors that might cause emotional or mental stress. Psychosocial hazards include poor work organization (e.g. time pressure, poor leadership support and communication), organisational culture (e.g. bullying), and control management (e.g. lack of consultation and constructive feedback, and disrespectful performance management; 3) personal health resources are the health services and supportive environment an organization provides to workers to monitor and improve physical and mental health; and 4) enterprise involvement in the community refers to the activities in which an organization might provide to support the social and physical wellbeing of a community in which it operates.

Besides the ethical and moral legal principle of doing no harm, workplaces require workers in order to attain their objectives, and there is a strong business case to be made for ensuring that workers are mentally and physical healthy through health protection and promotion. Unhealthy and unsafe workplace impact on employees` stress can induce different outcomes, such as accidents and injuries, burnout and depression. Those factors in turn have a negative impact on workers, such as increased absenteeism and presenteeism, and reduced job satisfaction. Consequently, costs and productivity losses are increased with a decline in quality of customer service.

1.7 Identified research gaps and dissertation rationales

In summary, the following gaps in the scientific literature on care workers` health guided the development and implementation of this dissertation.

First, previous nursing home research has addressed some issues on work-related injuries of care workers in the nursing home setting. However, most related studies have focused on musculoskeletal injuries or burnout and emotional exhaustion. Very few taped into alerting symptoms that could be an early indication of emotional exhaustion. Furthermore, needle stick injuries and other health problems such as allergies were not investigated in nursing homes. Existing studies have not comprehensively examined the various risk factors affecting the health of the care workers including psychosocial work environment aspects.

Second, even less research has been conducted on care workers presenteeism in comparison to absenteeism. Additionally, there are no Swiss nursing home studies in this regard. Trends and rates of presenteeism were mostly investigated in hospital settings. Related studies focused on very few aspects of the work environment rather than a comprehensive assessment of underlying risk factors.

Third, absenteeism has been widely investigated in association to its costs. However, presenteeism and its impact of care workers` job performance were less researched in nursing homes internationally, as well in Switzerland. Our understanding is that compromised health and presenteeism reduce job performance in that care workers will not follow organization guidelines in the provision of care and apply short cuts in the care [94], hence rationing of care might occur.

Fourth, care workers` job satisfaction is a significant factor in reducing care workers` turnover and retaining qualified staff. We learned from the literature that job satisfaction does not rely solely on individual characteristics, but also on one`s expectations and the nature of the job. Hence the need arises to investigate the most crucial factors in the nursing home work environment, which reduce or promote job satisfaction.

Given the knowledge gaps remaining to be filled, the following rationales apply for this dissertation.

First, a study is necessary to explore the prevalence of physical and mental health issues, and comprehensively investigate the underlying influential factors regarding care workers` s health in nursing homes that link between psychosocial work environment aspects and compromised physical and mental health. Empirical evidence on the relationship between work environment factors and compromised care workers` health is critical to the planning and implementation of measures reflecting on work environment modification, and will be necessary to justify initiatives and mobilization of efforts that aim to improve overall care workers health by improving the work environment aspects.

Second, the emerging of presenteeism and its effects on loss of productivity makes it crucial to explore the trends of such behaviour among nursing home care workers, in comparison to absenteeism. Examining the underlying risk factors that may influence the decision of nurses to turn up to work despite illness help managers and nursing directors better understand this phenomenon in order to validate initiatives that detect such behaviour. Reduce presenteeism implies promoting productivity and job performance to eventually ensure quality of care.

Third, understanding the impact of compromised health and presenteeism among nursing home care workers on rationing of care is a crucial element to ensure nursing adequate job performance and eventually quality of care.

Fourth, with the growing number of older people and the pressing need for long-term care in an era of care workers` shortage, identifying the influential factors on care workers` job satisfaction could be promising strategies to ensure care workers retention and adequate provision of safe care to residents.

Thus, the proposed dissertation will contribute to the international scientific literature, as well as expanding the existing knowledge and care workers` health in Swiss nursing homes.

1.8 Study aims

Given the identified gaps in the literature regarding care workers health in nursing homes, this research project includes the following aims:

- To explore the prevalence of physical and mental health outcomes among care workers in Swiss nursing homes (**Chapter 2**)

- To examine the association between selected factors in the psychosocial work environment and health outcomes of care workers (**Chapter 2**)

- To determine the prevalence of absenteeism and presenteeism among professional care workers in Swiss nursing homes (**Chapter 3**)

- To explore psychosocial work environment factors' associations with absenteeism and presenteeism (**Chapter 3**)

- To examine the prevalence of nursing home care worker-reported rationing of care (**Chapter 4**)

- To explore the relationships between care workers` health, presenteeism and rationing of care in nursing homes (**Chapter 4**)

- To determine job satisfaction among nursing home health care workers **(Chapter 5)**

- To examine the association between work environment factors and care workers' health issues in a representative national sample of nursing homes **(Chapter 5).**

1.9 References

1. De Jong T, B.E., Pawlowska-Cyprysiak K, Hildt-Ciupińska K, Malińska M, Nicolescu G, Trifu A, *Current and emerging issues in the healthcare sector, including home and community care: european Risk Observatory Report*. 2014.
2. BLS, *Bureau of Statistics: News release. Employer reported workplace Injuries and illnesses-2012*. 2013, US Department of Labor.
3. OFS. *Absence rate due to illness / accident of employees employed full-time by sex, nationality and occupancy rate*. 2012 [cited 21.03.2014; Available from: http://www.bfs.admin.ch/bfs/portal/fr/index/themen/03/02/blank/data/06.Document.169536.xls.
4. Alamgir, H., et al., *Work-related injury among direct care occupations in British Columbia, Canada.* Occup Environ Med, 2007. **64**(11): p. 769-75.
5. Widmer, R., *INTERIM RESULT : HOW DOES THE INTRODUCTION OF SwissDRG TO LONG-TERM CARE OFF*. 2013, CURAVIVA: Switzerland.
6. WHO, *Dementia a public health priority*. 2012, World Health Organization: Geneva, Switzerland.
7. Zuniga F, et al., *Rapport final de l`enquete relative au personnel de soins et d`accompagnement dans les établissments-médico-sociaux en Suisse*. 2013, Institute of Nursing Science-University of Basel: Basel.
8. Fjelltun AM, H.N., Norberg A, Gilje F, Normann HK, *Functional levels and nurse workload of elderly awaiting nursing home placement and nursing home residents: a comparative study. .* Scand J Caring Sci, 2009. **23**(4): p. 736e747.
9. Eatough, E.M., J.D. Way, and C.H. Chang, *Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints.* Appl Ergon, 2012. **43**(3): p. 554-63.
10. OSHA, *Ergonomics for the prevention of musculoskeletal disorders*, in *Healthcare Risk Management*. 2009, Occupational Safety and Health Administration: U.S. p. 1-40.
11. Taghinejad, H., et al., *Occupational mental health: A study of work-related mental health among clinical nurses.* J Clin Diagn Res, 2014. **8**(9): p. Wc01-3.
12. Zandi A, S.R., Ebadi A, Sanainasab H, *Frequency of depression, anxiety and stress in military Nurses.* Iranian Jounral of Military Medicine, 2011. **13**(2): p. 103-108.
13. IOM, *Nursing staff in hospitals and nursing homes: is it adequate?... excerpt below taken from IOM summary*, in *Maryland Nurse*. 1996. p. 6-8.
14. Neira, M., *Healthy workplaces: a model for action. For employers, workers, policy-makers and practitioners*. 2010, Wolrd Health Organization: Geneva, Switzerland.

15. Bell JL, C.J., Dalsey E, Sublet V *Slip, trip, and fall prevention for healthcare workers*. 2010, DHHS [NIOSH].
16. McCaughey, D., et al., *The relationship of positive work environments and workplace injury: evidence from the National Nursing Assistant Survey.* Health Care Manage Rev, 2014. **39**(1): p. 75-88.
17. Schmidt, S.G., et al., *The satisfaction with the quality of dementia care and the health, burnout and work ability of nurses: a longitudinal analysis of 50 German nursing homes.* Geriatr Nurs, 2014. **35**(1): p. 42-6.
18. Schoenfisch, A.L., et al., *Objective measures of adoption of patient lift and transfer devices to reduce nursing staff injuries in the hospital setting.* Am J Ind Med, 2011. **54**(12): p. 935-45.
19. D'Arcy, L.P., Y. Sasai, and S.C. Stearns, *Do assistive devices, training, and workload affect injury incidence? Prevention efforts by nursing homes and back injuries among nursing assistants.* Journal of Advanced Nursing, 2012. **68**(4): p. 836-845.
20. Miller, A., et al., *Evaluation of the effectiveness of portable ceiling lifts in a new long-term care facility.* Appl Ergon, 2006. **37**(3): p. 377-85.
21. Letvak, S. and C.J. Ruhm, *The impact of worker health on long term care: implications for nursing managers.* Geriatr Nurs, 2010. **31**(3): p. 165-9.
22. Tsolakas, T.C., J.P. Davies, and S. Oram, *THE NURSE'S LOAD.* Lancet, 1965. **2**(7409): p. 422-3.
23. Graham, P. and J.P. Dougherty, *Oh, their aching backs!: occupational injuries in nursing assistants.* Orthopaedic Nursing, 2012. **31**(4): p. 218-223.
24. Lelis CM, B.B.M., Taubert de Freitas FC, Rossi Rosa FL, Palucci Marziale MH, Cruz Robazzi ML, *Work-related musculoskeletal disorders in nursing professionals: an integrative literature review.* Acta Paulista de Enfermagem, 2012. **25**(3).
25. Park, R.M., et al., *Impact of publicly sponsored interventions on musculoskeletal injury claims in nursing homes.* Am J Ind Med, 2009. **52**(9): p. 683-97.
26. Ribeiro, S.B., M.C. Càrdia, and L.C. Almeida, *Biomechanical and organizational risk and prevalence of low back pain in the old adults caregivers of a nursing home in Joao Pessoa/PB.* Work, 2012. **41**(Suppl 1): p. 1933-1939.
27. EU-OSHA, *European survey of enterprises on new and emerging risks (ESENER): managing safety and health at work.* 2010, European Union: Luxembourg, Publications Office of the European Union.
28. Kamioka, H. and T. Honda, *Low back pain in female caregivers in nursing homes.*, in *Low Back Pain*. 2012, InTech.

29. Feng, C.K., Chen, M.L., and Mao, I.F. *Prevalence of and risk factors for different measures of low back pain among female nursing aides in Taiwanese nursing homes.* BMC Musculoskelet Disord, 2007. **8**: p. 52.
30. Alamgir, H., et al., *Needlestick and other potential blood and body fluid exposures among health care workers in British Columbia, Canada.* Am J Infect Control, 2008. **36**(1): p. 12-21.
31. Souza-Borges, F.R., L.A. Ribeiro, and L.C. Oliveira, *Occupational exposures to body fluids and behaviors regarding their prevention and post-exposure among medical and nursing students at a Brazilian public university.* Rev Inst Med Trop Sao Paulo, 2014. **56**(2): p. 157-63.
32. Stefanati, A., et al., *[A survey on injuries among nurses and nursing students: a descriptive epidemiologic analysis between 2002 and 2012 at a University Hospital].* Med Lav, 2015. **106**(3): p. 216-29.
33. Voide C., E.A.K., Darlinga, Kenfak-Foguenaa A., Erarda V., Cavassinia M., & Lazor-Blanchetb C., *Underreporting of needlestick and sharps injuries among healthcare workers in a Swiss University Hospital.* Swiss Medical Weekly, 2012. **142**(w13523).
34. Clarke, S.P., M. Schubert, and Ko¨rner T., *Sharp-device injuries to hospital staff nurses in 4 countries.* Infect Control Hosp Epidemiol, 2007. **28**(4): p. 473-478.
35. Kiss, P., M. De Meester, and L. Braeckman, *Needlestick injuries in nursing homes: the prominent role of insulin pens.* Infect Control Hosp Epidemiol, 2008. **29**(12): p. 1192-4.
36. CDC, *Updated U.S. Public Health Service: guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis.* , in *MMWR Recomm Rep*. 2001, U.S. Public Health Service: U.S. p. 1-42.
37. Pelissier, C., et al., *Impaired mental well-being and psychosocial risk: a cross-sectional study in female nursing home direct staff.* BMJ Open, 2015. **5**(3): p. e007190.
38. Testad I, M.A., Ballard C,, *Health and well-being in care staff and their relations to organizational and psychosocial factors, care staff and resident factors in nursing homes.* Int J Geriatr Psychiatry, 2010. **25**: p. 789-97.
39. Overshott R, B.A., *Treatment of dementia.* J Neurol Neurosurg Psychiatry, 2005**. 76(Suppl 5)**(v53-v59).
40. Schmidt, S.G., et al., *Distress experienced by nurses in response to the challenging behaviour of residents - evidence from German nursing homes.* J Clin Nurs, 2012. **21**(21-22): p. 3134-42.
41. Maslach, C., W.B. Schaufeli, and M.P. Leiter, *Job burnout.* Annual Review of Psychology, 2001. **52**(1): p. 397-422.

42. McHugh, M.D., et al., *Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care.* Health Aff (Millwood), 2011. **30**(2): p. 202-10.
43. Davey, M.M., et al., *Predictors of nurse absenteeism in hospitals: a systematic review.* J Nurs Manag, 2009. **17**(3): p. 312-30.
44. Halbesleben JR, W.B., Wakefield DS, & Cooper LB, *Nurse burnout and patient safety outcomes: nurse safety perception versus reporting behavior.* Western Journal of Nursing Research, 2008. **30**(560-577).
45. Flinkman, M., et al., *Explaining young registered Finnish nurses' intention to leave the profession: a questionnaire survey.* Int J Nurs Stud, 2008. **45**(5): p. 727-39.
46. Kowalski, C., et al., *Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities.* Res Dev Disabil, 2010. **31**(2): p. 470-9.
47. Burton, J., *WHO health workplace framework and model: background and supporting literature and practice*. 2010, WHO Headquarters: Geneva, Switzerland.
48. Hooper, P.D., *Presenteeism*. 2011, Cid Management: USA.
49. Aronsson, G., K. Gustafsson, and M. Dallner, *Sick but yet at work. An empirical study of sickness presenteeism.* J Epidemiol Community Health, 2000. **54**(7): p. 502-9.
50. Schultz, A.B. and D.W. Edington, *Employee health and presenteeism: a systematic review.* J Occup Rehabil, 2007. **17**(3): p. 547-79.
51. Catalina-Romeroa C, S.J., , Pastrana-Jiméneza JI, García-Diégueza N., Irízar-Muñoza I, Aleixandre-Chivab JL, Gonzalez-Quintelac A, & Calvo-Bonachoa E, *The impact of poor psychosocial work environment on non-work-related sickness absence.* Soc Sci Med, 2015. **138**: p. 210-216.
52. John, G., *Presenteeism in the workplace: A review and research agenda.* Journal of Organizational Behavior, 2010. **31**: p. 519-542.
53. Demerouti, E. and M.P. Le Blanc, *Present but sick: a three-wave study on job demands, presenteeism and burnout.* Career Development International, 2009. **14**(1): p. 50-68.
54. Elstad, J.I. and M. Vabo, *Job stress, sickness absence and sickness presenteeism in Nordic elderly care.* Scand J Public Health, 2008. **36**(5): p. 467-74.
55. Aronsson, G. and K. Gustafsson, *Sickness presenteeism: prevalence, attendance-pressure factors, and an outline of a model for research.* J Occup Environ Med, 2005. **47**(9): p. 958-66.
56. Dellve, L., E. Hadzibajramovic, and G. Ahlborg, Jr., *Work attendance among healthcare workers: prevalence, incentives, and long-term consequences for health and performance.* J Adv Nurs, 2011. **67**(9): p. 1918-29.

57. Szymczak, J.E., et al., *Reasons Why Physicians and Advanced Practice Clinicians Work While Sick: A Mixed-Methods Analysis.* JAMA Pediatr, 2015.
58. d'Errico, A., et al., *Low back pain and associated presenteeism among hospital nursing staff.* J Occup Health, 2013. **55**(4): p. 276-83.
59. Letvak, S.A., C.J. Ruhm, and S.N. Gupta, *Nurses' presenteeism and its effects on self-reported quality of care and costs.* Am J Nurs, 2012. **112**(2): p. 30-38; quiz 48, 39.
60. Bockerman, P. and E. Laukkanen, *What makes you work while you are sick? Evidence from a survey of workers.* Eur J Public Health, 2010. **20**(1): p. 43-6.
61. Dew, K. and T. Taupo, *The moral regulation of the workplace: presenteeism and public health.* Sociol Health Illn, 2009. **31**(7): p. 994-1010.
62. Gustafsson, K. and S. Marklund, *Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study.* Int J Occup Med Environ Health, 2011. **24**(2): p. 153-65.
63. Schultz, A.B., C.Y. Chen, and D.W. Edington, *The cost and impact of health conditions on presenteeism to employers: a review of the literature.* Pharmacoeconomics, 2009. **27**(5): p. 365-78.
64. Umann, J., L. De Azevedo Guido, and E. Da SIlva Grazziano, *Presenteeism in hospital nurses.* Rev Latino-Am. Enferm, 2012. **20**(1): p. 159-66.
65. Cancelliere, C., et al., *Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature.* BMC Public Health, 2011. **11**: p. 395.
66. Letvak, S., C. Ruhm, and S. Gupta, *Differences in health, productivity and quality of care in younger and older nurses.* Journal of Nursing Management, 2013. **21**: p. 914-921.
67. Callen, B.L., L.C. Lindley, and V.P. Niederhauser, *Health risk factors associated with presenteeism in the workplace.* J Occup Environ Med, 2013. **55**(11): p. 1312-7.
68. Collins, J.W., et al., *An evaluation of a "best practices" musculoskeletal injury prevention program in nursing homes.* Inj Prev, 2004. **10**(4): p. 206-11.
69. Waters, T., et al., *NIOSH research efforts to prevent musculoskeletal disorders in the healthcare industry.* Orthopaedic Nursing, 2006. **25**(6): p. 380-389.
70. Weber, S., *Ergonomics for healthcare providers.* J Am Acad Nurse Pract, 2006. **18**(1): p. 6-7.
71. Bailer, A.J., et al., *Worker Injuries and Safety Equipment in Ohio Nursing Homes.* Journal of Gerontological Nursing, 2012. **38**(6): p. 47-56.
72. Khatutsky, G., Wiener, J.M., Wayne L. A., & Porell, F.W, *Work-related injuries among certified nursing assistants working in US nursing homes*. 2012, Research Triangle Park: NC. p. 18.

73. Verbeek, J.H., et al., *Manual material handling advice and assistive devices for preventing and treating back pain in workers.* Cochrane Database Syst Rev, 2011(6): p. Cd005958.
74. Sezgin, D. and M.N. Esin, *Predisposing factors for musculoskeletal symptoms in intensive care unit nurses.* Int Nurs Rev, 2015. **62**(1): p. 92-101.
75. Bernal, D., et al., *Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: A systematic review and meta-analysis.* Int J Nurs Stud, 2015. **52**(2): p. 635-648.
76. Castle, N.G., et al., *A national view of workplace injuries in nursing homes.* Health Care Manage Rev, 2009. **34**(1): p. 92-103.
77. Simon, M., et al., *Back or neck-pain-related disability of nursing staff in hospitals, nursing homes and home care in seven countries--results from the European NEXT-study.* Int J Nurs Stud, 2008. **45**(1): p. 24-34.
78. NelsonA, B., AS, *Evidence-based practices for safe patient handling and movement.* Orthopaedic Nursing, 2006. **25**(6): p. 366-379.
79. Yip YB, *The association between psychosocial work factors and future low back pain among nurses in Hong Kong: a prospective study.* Psychol Health Med, 2002. **7**: p. 223-233.
80. Markovic-Denic, L., et al., *Occupational exposure to blood and body fluids among health-care workers in Serbia.* Med Princ Pract, 2014. **24**(1): p. 36-41.
81. Schmidt, K.H. and S. Diestel, *Job demands and personal resources in their relations to indicators of job strain among nurses for older people.* J Adv Nurs, 2013. **69**(10): p. 2185-95.
82. Piko, B.F., *Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: a questionnaire survey.* Int J Nurs Stud, 2006. **43**(3): p. 311-8.
83. Aiken LH, C.S., Sloane DM, Lake ET, Cheney T,, *Effects of hospital care environment on patient mortality and nurse outcomes.* The Journal of Nursing Administration, 2009. **39**(7-8 Suppl.): p. S45-S51.
84. Willemse, B.M., et al., *The moderating role of decision authority and coworker- and supervisor support on the impact of job demands in nursing homes: a cross-sectional study.* Int J Nurs Stud, 2012. **49**(7): p. 822-33.
85. Johnson, J.V. and E.M. Hall, *Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population.* Am J Public Health, 1988. **78**(10): p. 1336-42.
86. Schmidt, K.H. and S. Diestel, *Differential effects of decision latitude and control on the job demands-strain relationship: a cross-sectional survey study among elderly care nursing staff.* Int J Nurs Stud, 2011. **48**(3): p. 307-17.
87. Pai, D.D., et al., *Violence, Burnout and Minor Psychiatric Disorders in Hospital Work.* Rev Esc Enferm USP, 2015. **49**(3): p. 457-64.

88. NIOSH. *Violence: Occupational Hazards in Hospitals*. 2002, Centers for Disease Control and Prevention/NIOSH: Cincinnati, OH.
89. Tak, S., et al., *Workplace assaults on nursing assistants in US nursing homes: a multilevel analysis.* Am J Public Health, 2010. **100**(10): p. 1938-45.
90. Hansen, C.D. and J.H. Anderson, *Going ill to work : what personal circumstances, attitudes and work-related factors are associated with sickness presenteeism?* Social Science & Medicine, 2008. **67**: p. 956-964.
91. Rantanen, I. and R. Tuominen, *Relative magnitude of presenteeism and absenteeism and work-related factors affecting them among health care professionals.* Int Arch Occup Environ Health, 2011. **84**(2): p. 225-30.
92. Castle, N.G. and J.C. Ferguson-Rome, *Influence of Nurse Aide Absenteeism on Nursing Home Quality.* Gerontologist, 2014.
93. Michie, S. and S. Williams, *Reducing work related psychological ill health and sickness absence: a systematic literature review.* Occup Environ Med, 2003. **60**(1): p. 3-9.
94. Barker, L.M. and M.A. Nussbaum, *Fatigue, performance and the work environment: a survey of registered nurses.* J Adv Nurs, 2011. **67**(6): p. 1370-82.
95. Ausserhofer, D., et al., *Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study.* BMJ Qual Saf, 2014. **23**(2): p. 126-35.
96. Lucero, R., E. Lake, and L. Aiken, *Variations in nursing care quality across hospitals.* J Adv Nurs, 2009. **65**(11): p. 2299-310.
97. Kalisch BJ, L. G, and W. RA., *Missed nursing care: errors of omission.* Nurs Outlook 2009. **57**(1): p. 3-9.
98. Schubert, M., et al., *Validation of the Basel Extent of Rationing of Nursing Care instrument.* Nurs Res, 2007. **56**(6): p. 416-24.
99. Tourangeau, A.E., L.A. Cranley, and L. Jeffs, *Impact of nursing on hospital patient mortality: a focused review and related policy implications.* Qual Saf Health Care, 2006. **15**(1): p. 4-8.
100. Ball JE, et al., *'Care left undone' during nursing shifts: associations with workload and perceived quality of care.* BMJ Qual Saf, 2014. **23**: p. 116-125.
101. Division, U.N.P., *World population ageing 1950–2050,* 2002. United Nations Population Division.
102. WHO. *Alzheimer's disease international. Dementia: a public health priority*. 2012, WHO: WHO Press, Geneva, Switzerland.
103. Association, A.s., *2013 Alzheimer's disease facts and figures.* Alzheimer's & Dementia, 2013. **6**(2): p. 208-245.

104. Fujisawa R and C. F, *The Long-Term Care Workforce: Overview and Strategies to Adapt Supply to a Growing Demand in OECD Health Working Papers*. 2009, OECD.
105. Hayes L.J., e.a., *Nurse turnover: a literature review.* Int J Nurs Stud, 2006. **42**(2): p. 237-263.
106. Locke EA, *What is job satisfaction?* Organizational Behavior and Human Performance, 1969. **4**(4): p. 309-336.
107. Hunt, S.R., et al., *Registered nurse retention strategies in nursing homes: a two-factor perspective.* Health Care Manage Rev, 2012. **37**(3): p. 246-56.
108. Castle, N.G., H. Degenholtz, and J. Rosen, *Determinants of staff job satisfaction of caregivers in two nursing homes in Pennsylvania.* BMC Health Serv Res, 2006. **6**: p. 60.
109. Squires, J.E., et al., *Job Satisfaction among Care Aides in Residential Long-Term Care: A Systematic Review of Contributing Factors, Both Individual and Organizational.* Nurs Res Pract, 2015. **2015**: p. 157924.

CHAPTER 2

CARE WORKERS HEALTH IN SWISS NURSING HOMES AND ITS ASSOCIATION WITH PSYCHOSOCIAL WORK ENVIRONMENT

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2.1 Abstract

Background: Previous studies have demonstrated poor health of care workers in nursing homes. Yet, little is known about the prevalence of physical and mental health outcomes, and their associations with the psychosocial work environment in nursing homes.

Objectives: (1) To explore the prevalence of physical and mental health outcomes of care workers in Swiss nursing homes, (2) their association with psychosocial work environment.

Methods: This is a secondary data analysis of the cross-sectional Swiss Nursing Home Human Resources Project (SHURP). We used survey data on socio-demographic characteristics and work environment factors from care workers (N=3,471) working in Swiss nursing homes (N=155), collected between May 2012 and April 2013. GEE logistic regression models were used to estimate the relationship between psychosocial work environment and physical and mental health outcomes, taking into account care workers` age.

Results: Back pain (19.0%) and emotional exhaustion (24.2%) were the most frequent self-reported physical and mental health. Back pain was associated with increased workload (OR 1.52, CI 1.29-1.79), conflict with other health professionals and lack of recognition (OR 1.72, CI 1.40-2.11), and frequent verbal aggression by residents (OR 1.36, CI 1.06-1.74), and inversely associated with staffing adequacy (OR 0.69, CI 0.56-0.84); emotional exhaustion was associated with increased workload (OR 1.96, CI 1.65-2.34), lack of job preparation (OR 1.41, CI 1.14-1.73), and conflict with other health professionals and lack of recognition (OR 1.68, CI 1.37-2.06), and inversely associated with leadership (OR 0.70, CI 0.56-0.87).

Conclusions: Physical and mental health among care workers in Swiss nursing homes is of concern. Modifying psychosocial work environment factors offer promising strategies to improve health. Longitudinal studies are needed to conduct targeted assessments of care workers health status, taking into account their age, along with the exposure to all four domains of the proposed WHO model.

2.2 Introduction

The WHO defines a healthy workplace as a place that *"(…) provides all members of the workforce with physical, psychological, social and organizational conditions that protect and promote health (…)"* [1]. Care workers in health services are at substantial risk for compromised health, both physically and mentally [1]. In 2012, Switzerland reported 3.1 injuries per 100 full-time workers in the health sector [2], similar to those reported in the U.S. health sector [3]. Physical health includes not only diagnosed illnesses, but also conditions in which the person has no specific disease, yet is not at optimal health. Similarly, mental health may not always reach the level of a diagnosable disorder, yet it can still make the worker suffer [1].

While recent studies have extensively examined the physical and mental health of hospital care workers [4-7], the nursing home setting has been less researched internationally. For example, in Switzerland, the introduction of Diagnostic Related Group (DRG) [8] has set the trend for nursing homes to deliver sub-acute care to residents with complex medical conditions. The majority of residents is diagnosed with dementia or demonstrates the symptoms, and requires assistance in the activities of daily living. Despite the availability of some ergonomic tools for lifting, care workers do not use them consistently, and they participate in some high risk nursing tasks (e.g. injections of medications and capillary/venous blood sampling). As a result, nursing home care workers perform many physically & emotionally straining activities that put them at risk of injuries.

Musculoskeletal injuries (e.g. back pain) have been reported as one of the most predominant physical health outcomes among care workers in nursing homes [9, 10], where job demands require frequent handling of patients in bed. Consequently, care workers often complain of back pain [11, 12]. Several of the studies that have examined musculoskeletal injuries, found that a positive work environment, including social support at work [13], good relationship with colleagues [14], and the availability of ergonomic equipment and training programs, was associated with a decrease in the rate of compensation claims for injuries [15-17]. However, most of these findings are not generalizable to all nursing home care workers, as they were limited to nurse aides [18].

Another risk for compromised physical health condition is the exposure to needle stick injuries [19] and skin diseases [20, 21]. Previous studies found that the lack of training might explain the occurrence of these injuries [22] and dermatitis [21]. Despite the mounting risk, only few studies have examined the risk of needle stick injuries in nursing homes [19].

In addition to the physical strain and injuries, nurses are at risk of fatigue and emotional stress [23]. The transactional theory suggests that work environment and its stressors cause psychological strain responses in the person [24], which has an impact on the worker emotional health, such as feeling overwhelmed with work situations [25]. Some studies have identified work environment stressors as incompatible role expectations from the supervisor, interpersonal conflict, leadership styles and abusive supervision [25]. Nonetheless, few studies have examined the

relationship between the work environment and emotional exhaustion in the nursing home setting. Evidence has shown that the work environment, specifically high job demands [26, 27], high workload, and low job autonomy [27] are associated with emotional exhaustion. Furthermore, a recent study on hospital nurse aides found that workplace violence was associated with minor emotional disorders [28].

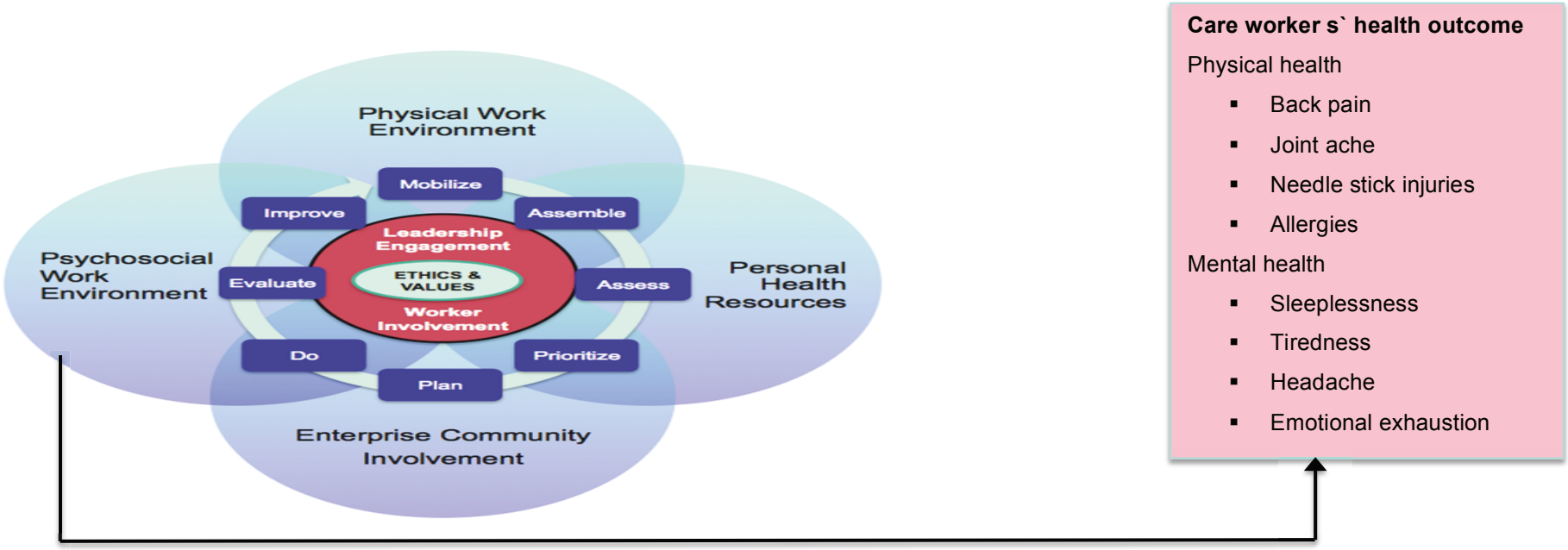
2.3 Conceptual Framework

The WHO Model of Healthy Workplace [1, 29] was proposed to describe the key components of a healthy workplace. The model focuses on four fundamental domains, specifically 1) the physical work environment, 2) the psychosocial work environment, 3) personal health resources, and 4) the enterprise community involvement to provide guidance for employers to explore worker`s health and to intervene, in order to sustain the organization. Our goal in this study is to examine to what extent selected factors (based on data available through the SHURP study) within one of the model domains, the psychosocial work environment, exist and related to care worker physical and mental health outcomes **(Figure1)**. The psychosocial work environment includes the organizational culture and daily practices, which can affect both physical and emotional health, and may include work stressors, percentage of residents with dementia, staffing resources inadequacy, poor leadership, lack of workers` participation in decision making, poor collaboration with the management and among colleagues, low job autonomy, and workplace violence.

To date, there is a lack of international as well as Swiss studies about the health of nursing home care workers (including registered nurses, licensed practical nurses, certified nursing assistants, and nurse aides) and the impact of the work environment as a risk factor. Accordingly, the purpose of this study was to

1. Explore the prevalence of physical and mental health outcomes among care workers in Swiss nursing homes.
2. Explore the association between selected factors in the psychosocial work environment and health outcomes of care workers.

Figure 1. The WHO Model of Healthy Workplace



Adopted from Burton (2010) [1] & Neira (2010) [29]

2.4 Methods

2.4.1 Study design, setting, and sample

This is a secondary data analysis of the multi-center, cross-sectional study Swiss Nursing Homes Human Resources Project (SHURP). Sampling and survey methods of the SHURP study are described in detail elsewhere [30].

The SHURP study included a representative random sample of 162 nursing homes across Switzerland, stratified according to language region, size, and profit status of the nursing home. Nursing homes smaller than 20 beds, residential homes, and rehabilitation clinics for geriatrics were excluded. After excluding facilities and units that did not provide data on unit level characteristics, a sub-sample of 155 facilities was included in the current study.

In the parent study, 6,947 questionnaires were distributed and 5,323 were returned resulting in an overall 76.6% response rate. Care workers of all educational levels who provided direct care to the nursing home residents, in addition to managers of the nursing home facilities, were invited to complete the questionnaire survey. Care workers who had worked less than 8 hours weekly, less than 1 month on the unit, or who were students were excluded. In the current study, we excluded respondents with leadership positions (middle and upper management n=805) regardless of their professional category (registered nurses and licensed practical nurses), and units with missing responses from the total sample, resulting in a sub-sample of 3,471 care workers (including registered nurses, licensed practical nurses, certified nursing assistants, and nurse aides).

2.4.2 Data sources, variables and measurements

Socio-demographic and professional data on care workers, including their perception of their work environment, work stressors, workplace violence, and physical and mental health outcomes, were collected using the Care worker Personnel Questionnaire of the SHURP study.

The nursing home facility characteristics and the number of residents with dementia present on the unit were captured from the administration SHURP Facility Profile and Unit Profile questionnaires, respectively.

The SHURP study has established the content validity of each of the scales used by testing the relevance of each variable and scale separately, and obtaining item content validity index (I-CVI) and scale content validity index (S-CVI), respectively. Further information related to the development of the questionnaire and the survey validity pre-testing are described elsewhere [30]. In the current study, we used the following variables:

Care worker and facility characteristics

Care workers and facility characteristics are used as control variables (except for care workers` age, treated a risk factor) to describe the study sample, as they are major in this topic. The socio-demographic data included: age; gender; professional category (i.e. registered nurses, licensed practical nurses/certified nursing assistants, nurses aides); professional experience in nursing in years; percentage of time employed corresponding to number of hours worked per week (ranging from 8hrs/week=20% to 42hrs/week=100% employment); usual work shifts (days/evenings/nights, days/evenings, or night shifts); overtime frequency (1 to 4 ranging from1=almost every shift, 2=every 2-4 working days, 3= every 5-7 working days, to 4=less frequently). The professional categories of the care workers were based on their nursing education level, as follows: registered nurses with three to six years of education holding a diploma in nursing, bachelor degree (BSc.N. or equivalent) or higher; licensed practical nurses (LPN)/certified nursing assistants (CNA) with three and two years of education respectively; and nurse aides with short courses or on-the-job training. Care workers` age (in years); 1=18-30; 2=31-40; 3=41-50; 4=older than 50) was treated as a risk factor as it may have an impact on different health outcomes.

Facility characteristics included nursing home size (ranging from small: 20-49 beds, medium: 50-99 beds, to large: ≥100 beds), language region (German-, French-, Italian speaking area), and ownership status (private, private subsidized, public).

Physical and mental health outcomes

Four physical health outcomes were examined: self-reported back pain, joint pain, needle stick injuries, and work-related allergies. The occurrence of back pain and joint pain during the 4 weeks prior to the survey was measured on a 3-point Likert scale (1=not at all, 2=a little bit, 3=strongly) by two items from the Swiss Health Survey for [31]. For needle stick injuries, an item from the RICH-Nursing study questionnaire [32] was used to ask care workers if they had injured themselves during the last 6 months with a needle stick or a sharp tool that was used on a resident in their nursing home (0=no injury, 1=yes). An investigator-developed item with a 3-point Likert-type response option (=not at all, 2=a little bit, 3=strongly) was used to ask about work-related allergies such as dermatitis and asthma during the past 4 weeks.

Four mental health outcomes were measured: self-reported tiredness, sleeplessness, headache, and emotional exhaustion related to work. The presence of tiredness, sleeplessness, and headache during the past 4 weeks was measured on a 3-point Likert scale (1=not at all, 2=a little bit, 3=strongly) using items from the Swiss Health Survey [31]. The feeling of exhaustion from work was measured on a 7-point Likert scale (ranging from 0=never, to 6=daily) using an item from the Maslach Burnout Inventory (MBI) [33].

Psychosocial work environment factors

Work stressors items were selected from the Health Professions Stress Inventory (HPSI) [34, 35] to measure the frequency of several work-related stressors measured by a 5-point Likert scale (0=never, 1=seldom, 2=sometimes, 3=often, 4=very often). To reduce the survey burden, we asked experts (holding at least a Certificate of Advanced Studies up to a Master's degree with experience in nursing home care) from the gerontological field concerning the relevance of each question. Each item was rated for its understandability for nursing home personnel (yes/no), and for its relevance concerning resident safety on a 4-pont scale (1=not relevant, 2=somewhat relevant, 3=quite relevant, 4=very relevant). The item content validity (I-CVI) was calculated for each item as the percentage of experts who rated it 3 or 4. The average scale content validity (S-CVI/Ave) was calculated as the mean of all I-CVI. Reducing the items from 30 to 12, the psychometric analysis of the remaining items produced 3 sub-scales tested for internal consistency (Cronbach`s alpha) and measuring stress-producing factors: stress due to (1) workload (Cronbach alpha 0.73), (2) a lack of job preparation (Cronbach alpha 0.63), and (3) conflict and lack of recognition (Cronbach alpha 0.76). Stress due to workload was measured by three items that asked about dealing with difficult situations, having too much work to do, and there not being enough people working. Stress due to lack of job preparation was measured by three items asking about fear of committing mistake, being overwhelmed when caring for terminally ill residents, and not being prepared to meet the residents' needs. Conflict and lack of recognition was measured by six items that asked about disagreement with other professionals, conflicts with superiors, lack of information, not being asked about one's opinion, low pay, and underuse of skills. "Conflict" and "lack of recognition" were combined based on Exploratory Factor Analysis. The SHURP team did a multiple group EFA (three language region groups), and all factor loadings of the subscale conflict and lack of recognition were significant and above 0.3 (range 0.371-0.734; 90% CI 0.043-0.050).

The percentage of residents with dementia was calculated in reference to the total number of residents present on the units at the time of the survey. Residents diagnosed with dementia or manifested symptoms of dementia were included. This factor is included since it often involves complex labor working with cognitively impaired residents and can induce stress among nursing home care workers.

Care worker perceptions about nursing home leadership and staffing adequacy were measured by items adapted for nursing home use from two subscales of the Practice Environment Scale of the Nursing Work Index (PES-NWI) questionnaire [36]*:* "Nurse manager ability, leadership, and support of care workers" (Cronbach alpha 0.843) and "Staffing and resources adequacy" (Cronbach alpha 0.743), respectively. Leadership included whether unit supervisor was perceived as supportive and as a competent leader, whether mistakes are used as a learning opportunity, an whether care workers receive reward and recognition for a job well done, and back up in decision

making. Staffing adequacy included enough staff to get the work done, to provide quality care, and to discuss resident problems. Additionally, a single item assessing participation in decision-making was used. Items were rated on a 4-point Likert scale (1=strongly disagree, 2=slightly disagree, 3=slightly agree, 4=strongly agree).

Collaboration with the nursing director and collaboration with colleagues were adopted from the Safety Attitude Questionnaire (SAQ) [37], rated on a 4-point Likert scale (1=very low, 2=rather low, 3=rather high, 4=very high), allowing the answer option "don't know". In small sized nursing homes, the nursing director can hold managerial responsibilities such as nursing supervisor duties. As a result, all care workers can have collaboration with the nursing director. To measure autonomy at work, one investigator-developed item was used to ask care workers to rated the extent to which they agreed that they decided on their own how to go about doing their work. The item was rated on a 4-point Likert scale (1=strongly disagree, 2=slightly disagree, 3=slightly agree, 4=strongly agree).

Workplace violence was measured by the residents' verbal and physical aggressive behaviours toward care workers. The descriptions of verbal or physical aggression were derived from the Ryden`s Aggression Scale [38]. Care workers were asked about the frequency of resident physical and verbal aggressive behaviour towards them during the past 4 weeks on a 6-point Likert scale (0=never, 1=less than once a week, 2=approximately once a week, 3= several times a week, 4=daily, 5=several times a day).

2.4.3 Data collection and analysis

The SHURP survey was administered between May 2012 and April 2013. Further information related to data collection is described elsewhere in detail [30].

To address aim 1, we calculated descriptive statistics (frequencies, percentages, means, standard deviations). For aim 2, we first used a bivariate logistic regression to explore associations between facilities and care workers characteristics and each physical and mental health outcome. We used generalized estimation equation (GEE) multiple regression models to take the clustering of care workers in nursing home units into account. In a second step, we used multiple logistic GEE regression models to estimate odds ratios (ORs) and 95% Confidence Intervals (CI) for risk factors (psychosocial work environment), adjusted for facility and care workers characteristics. We dichotomized all health outcomes in order to capture care workers with self-reported compromised health: back pain, joint ache, allergies, sleeplessness, tiredness, headache: 0= not at all and a little bit, 1=strongly; needle stick injuries: 0=no, 1=yes; emotional exhaustion: 0= never, several times a year or less, once a month or less, and several times a month, 1= once a week, several times a week, and daily. We also assessed multi-collinearity of all work environment factors with the variance inflation factor (VIF). Based on the VIF, all variables were kept because all values remained below the threshold of 5 [39]. To explore the robustness of the analysis to the model specifications we run

the same regression equations with dependent variables specified as ordinal variables, indicating similar results as in the binary logistic regression models. The maximum of missing responses per variable was 5%. We therefore applied list wise deletion to deal with missing data. All data analyses were conducted with IBM/SPSS for Mac Statistics 21.0.We report adjusted results of our GEE logistic regression models analysis.

2.4.4 Ethical approval

The study aims are covered by the SHURP study, for which the ethic committee of the state of 'Beider Basel' (Ref. Nr. granted ethical approval. EK:02/12) gave approval. All participating nursing home administrators and nursing directors gave written consent for the SHURP study. The return of the care worker SHURP questionnaires was treated as an informed consent.

2.5 Results

2.5.1 Description of sample

Overall, 155 nursing homes, and 3,471 care workers participated in the study. **Table 1** summarizes the characteristics of the facilities and the participants, as well as the work environment factors**.** Across all facilities, the majority of care workers were females (92.4%) and one third (33%) were older than 50 years. One fourth of the participants were registered nurses (23.6%), while the largest professional category was licensed practical nurses /certified nursing assistant (42.9%). As for employment percentage, less than one third were employed either full time (23.2%) or up to 50% (21.7%), with more than 20 years of nursing experience (23.9%). The majority of the respondents (75.0%) reported overtime less than once a week and only 2% reported doing overtime every shift. The majority of respondents worked day/evening shifts (56.3%). The care workers experienced a high degree of participation in decision-making (86.4%), collaboration (88.5%), and autonomy (80.8%) at work, all measures of psychosocial work environment. In terms of workplace violence, 25.3% of the respondents experienced verbal aggressiveness by residents several times a week or more often in the past four weeks.

Table 1. Characteristics of nursing home facilities, care workers, and work environment factors

Nursing home characteristics (N=155 facilities)	**n (%)**	**Means (SD)**
Language speaking region		
German	117 (75.5)	
French	29 (18.7)	
Italian	9 (5.8)	
Profit status		
Public	68 (37.4)	
Private subsidized	40 (25.8)	
Private	57 (36.8)	
Nursing home size		
Small (20-49beds)	60 (38.7)	
Medium (50-99 beds)	73 (47.1)	
Large (≥100 beds)	22 (14.2)	
Care worker characteristics (N=3,471)		
Gender (n= 3456)		
Females	3192 (92.4)	
Age groups (years)(n=3402)		
18-30	751 (22.1)	
31-40	600 (17.6)	
41-50	929 (27.3)	
>50	1122(33.0)	
[1]*Nursing job category (n=3471)*		
Registered Nurse	912 (26.3)	
LPN/CNA	1488 (42.9)	
Nurse Aide	1071 (30.9)	

Employment percentage (n=3430)		
Up to 50%	745 (21.7)	
51%-90%	1889 (55.1)	
>90%	796 (23.2)	
Professional experience in nursing (years) (n=3360)		
Up to 5	720 (21.4)	
6-10	803 (23.9)	
11-15	613 (18.2)	
16-20	420 (12.5)	
>20	804 (23.9)	
Overtime Frequency (n=3450)		
Almost every shift	65 (1.9)	
Every 2-4 working days	285(8.3)	
Every 5-7 working days	511 (14.8)	
Less frequently	2589 (75.0)	
Usual shifts (n=3446)		
Regular change of shift	1294 (37.6)	
Day/evening only	1939 (56.3)	
Night only	213 (6.2)	
Psychosocial Work Environment		
Leadership (n=3471)		3.14 (0.60)
Work stressors		
Workload (n=3467)		1.56 (0.83)
Lack of job preparation (n=3464)		0.68 (0.59)
Conflict & lack of recognition (n=3467)		0.91 (0.67)
Residents (%) with dementia (n=401 units)		61.85 (24.41)

Staffing adequacy (n=3468)		2.82 (0.67)
[2]*Workplace Violence towards care worker*		
(Several times a week to several times a day)		
Verbal aggression (n=3456)	873 (25.3)	
Physical aggression (n=3455)	394 (11.4)	
[3]*Participation in decision making (n=3455)*	2985 (86.4)	
[4]*Collaboration with*		
Nursing Director (n=3271)	2894 (88.5)	
Colleagues *(n=3429)*	3281 (95.7)	
[3]*Autonomy (n=3450)*	2786 (80.8)	

[1] Registered nurses or higher received 3-6 years of education; licensed practical nurses (LPN)/certified nursing assistant (CNA) received 2-3 years of education; nurse aides received on the job training.
[2]Workplace violence: 0=never, less than once a week, approximately once a week; 1= several times a week, daily, several times a day; [3]Participation& autonomy: 0=strongly disagree, slightly disagree, 1=slightly agree, strongly agree; [4]collaboration: 0=very low, rather low; 1=rather high, very high; 2= Don't know. Group "1" is being reported.

2.5.2 Prevalence of Care workers health outcomes

Of the care workers, 38% and 27.4% reported at least one compromised physical health and one mental health outcome, respectively. Back pain (19.0%) and joint pain (13.5%) were more frequent in comparison to needle stick injuries (2.1%) and allergies (1.0%) (**Table 2)**. Mental health outcomes were more prevalent than physical health outcomes. Emotional exhaustion from work (24.2%) was more common than tiredness (14.4%), sleeplessness (12.6%), and headaches (9.9%).

Table2. Prevalence of workplace physical and mental health outcomes	
Physical health outcomes (care worker-reported)	**n (%)**
*Needle stick injuries (n=3457)	71 (2.1)
**Allergies (n=3459)	36(1.0)
**Back pain (n=3450)	655 (19.0)
**Joint pain (n=3446)	464 (13.5)
Total physical health outcomes (n=3410)	
≥ 1 Physical health reported outcomes	1296 (38)
Mental health outcomes (care worker-reported)	**n (%)**
**Sleeplessness (n=3442)	432 (12.6)
**Tiredness (n=3442)	494 (14.4)
**Headache (n=3430)	339 (9.9)
***Emotional Exhaustion (n=3442)	834 (24.2)
Total mental health outcomes (n=3433)	
≥ 1 Mental health reported outcomes	939 (27.4)

*Needle stick injuries: 0= no, 1=yes;
**Allergies, Back pain, joint ache, headache, tiredness, sleeplessness: 0=never & a little bit; 1=strongly;
***Emotional exhaustion: 0= never, several times a year or less, once a month or less, and several times a month, 1= once a week, several times a week, and daily. Group "1" is being reported.

2.5.3 Association between work environment and care workers` health

In the development of the model, the analysis showed no differences among professional categories in relation to health outcomes. However, along with age, psychosocial work environment factors were correlated with care worker reported physical and mental health outcomes **(Table 3)**. Back pain was associated with increased workload stress (OR 1.52, CI 1.29-1.79), stress due to conflict with other health professionals and lack of recognition (OR 1.72, CI 1.40-2.11), and frequent verbal aggression by residents towards care workers (OR 1.36, CI 1.06-1.74), and inversely associated with staffing adequacy (OR 0.69, CI 0.56-0.84), lack of job preparation (OR 0.70, CI 0.57-0.85), and all age groups (31 to 40 years: OR 0.70, CI 0.51-0.97; 41-50 years: OR 0.54, CI 0.38-0.77; older than 50 years: OR 0.46, CI 0.33-0.66). Joint pain was associated with increased perceptions of workload (OR 1.57, CI 1.28-1.92), conflict with other health professionals and recognition stress (OR 2.06, CI 1.62-2.63), frequent verbal aggression by residents (OR 1.50, CI 1.12-2.02), care workers older than 50 years (OR 1.93, CI 1.28-2.91), and inversely associated with perceived staffing adequacy (OR 0.75, CI 0.58-0.95). There were no significant associations between the psychosocial work environmental factors and age groups measured and needle stick injuries or work-related allergies.

We also found several associations between the psychosocial work environment, and age groups and mental health outcomes. Sleeplessness was associated with increased workload stress (OR 1.52, CI 1.26-1.84), conflict with other health professionals and lack of recognition stress (OR 1.92, CI 1.52-2.41), and care workers older than 50 years (OR 1.52, CI 1.03-2.24). Tiredness was associated with increased workload stress (OR 2.11, CI 1.74-2.58) and conflict with other health professionals and lack of recognition stress (OR 2.06, CI 1.66-2.55), and was inversely associated with perceptions of staffing adequacy (OR 0.68, CI 0.54-0.86), self-reported autonomy (OR 0.66, CI 0.50-0.87), and care workers older than 40 years (41-50: OR 0.44, CI 0.30-0.65; older than 50: OR 0.37, CI 0.23-0.57). Headache was associated with increased workload stress (OR 1.27, CI 1.04-1.55) and conflict with other health professionals and lack of recognition stress (OR 2.11, CI 1.65-2.70), and inversely associated with collaboration with the nursing director (OR 0.68, CI 0.47-0.99), and care workers older than 40 years (41-50: OR 0.55, CI 0.36-0.86; older than 50: OR 0.42, CI 0.27-0.66). Emotional exhaustion was associated with increased workload stress (OR 1.96, CI 1.65-2.34), lack of job preparation stress (OR 1.41, CI 1.14-1.73), and conflict and lack of recognition stress (OR 1.68, CI 1.37-2.06), and was inversely associated with care workers' perceptions about leadership (OR 0.70, CI 0.56-0.87), and care workers of all age groups (31-40: 0.65, CI 0.48-0.89; 41-50: OR 0.55, CI 0.40-0.76; older than 50: OR 0.58, CI 0.41-0.81).

Table 3. Associations between age, work environment and mental and physical health outcomes[‡]

Explanatory variables	**Physical health outcomes**			
	Back pain	**Joint pain**	**Needle stick injuries**	**Allergies**
	OR (95%CI)	**OR (95%CI)**	**OR (95%CI)**	**OR (95%CI)**
[1]*Age groups (years)*				
▪ 31-40	0.70 (0.51-0.97)*	1.19 (0.78-1.81)	1.27 (0.51-3.13)	2.59 (0.76-8.86)
▪ 41-50	0.54 (0.38-0.77)**	1.41 (0.93-2.15)	1.06 (0.39-2.87)	0.75 (0.18-3.10)
▪ >50	0.46 (0.33-0.66)**	1.93 (1.28-2.91)**	0.89 (0.37-2.16)	0.47 (0.10-1.24)
Psychosocial work environment				
Leadership	1.11(0.87-1.42)	1.11(0.84-1.46)	0.68(0.38-1.22)	0.42(0.14-1.31)
Work stressors				
▪ Workload	1.52(1.29-1.79)**	1.57(1.28-1.92)**	0.77(0.51-1.16)	1.33(0.69-2.56)
▪ Lack of job preparation	0.70(0.57-0.85)**	0.91(0.71-1.16)	1.66(0.97-2.85)	1.61(0.83-3.10)
▪ Conflict & lack of recognition	1.72(1.40-2.11)**	2.06(1.62-2.63)**	1.36(0.81-2.30)	2.01(0.94-4.33)
▪ Percentage of residents with dementia	0.99(0.99-1.0)	0.99(0.99-1.0)	1.00(0.99-1.02)	0.99(0.97-1.01)
Staffing adequacy	0.69(0.56-0.84)**	0.75(0.58-0.95)*	0.66(0.40-1.10)	1.06(0.48-2.33)

[2]*Workplace Violence towards care worker*				
▪ Verbal Aggression	1.36(1.06-1.74)*	1.50(1.12-2.02)**	0.99(0.48-2.08)	2.17(0.94-5.0)
Physical Aggression	1.02(0.74-1.40)	0.91(0.64-1.33)	0.91(0.33-2.53)	0.47(0.15-1.46)
[3]*Participation in decision making*	1.11(0.79-1.58)	1.30(0.91-1.86)	1.30(0.57-2.94)	1.99(0.60-6.55)
[4]*Collaboration*				
▪ Nursing Director	0.90(0.66-1.23)	0.80(0.57-1.13)	1.23(0.53-2.85)	1.56(0.48-5.10)
▪ Colleagues	1.25(0.78-1.99)	1.73(0.95-3.13)	1.27(0.40-4.09)	0.94(0.21-4.05)
[3]*Autonomy*	0.97(0.74-1.26)	1.10(0.81-1.44)	1.18(0.65-2.12)	0.75(0.38-1.46)
Explanatory variables		**Mental health outcomes**		
	Sleeplessness OR (95%CI)	**Tiredness OR (95%CI)**	**Headache OR (95%CI)**	**Emotional Exhaustion OR (95%CI)**
[1]*Age groups (years)*				
▪ 31-40	0.84 (0.55-1.30)	0.67 (0.43-1.04)	1.08 (0.71-1.66)	0.65 (0.48-0-89)**
▪ 41-50	1.02 (0.67-1.56)	0.44 (0.30-0.65)**	0.55 (0.36-0.86)**	0.55 (0.40-0.76)**
▪ >50	1.52 (1.03-2.24)*	0.37 (0.23-0.57)**	0.42 (0.27-0.66)**	0.58 (0.41-0.81)**
Psychosocial work environment				
Leadership	0.75(0.56-1.0)	1.12(0.84-1.49)	1.04(0.79-1.40)	0.70(0.56-0.87)**

Work stressors				
▪ Workload	1.52(1.56-1.84)**	2.11(1.74-2.58)**	1.27(1.04-1.55)*	1.96(1.65-2.34)**
▪ Lack of job preparation	0.98(0.78-1.22)	0.8(0.64-1.0)	0.87(0.68-1.11)	1.41(1.14-1.73)**
▪ Conflict & lack of recognition	1.92(1.52-2.41)**	2.06(1.66-2.55)**	2.11(1.65-2.70)**	1.68(1.37-2.06)**
▪ Percentage of residents with dementia	0.99(0.99-1.0)	0.99(0.99-1.00)	0.99(0.99-1.0)	1.00(0.99-1.01)
Staffing adequacy	0.92(0.73-1.17)	0.68(0.54-0.86)**	0.86(0.65-1.14)	0.84(0.68-1.03)
[2]*Workplace Violence towards care worker*				
▪ Verbal Aggression	1.27(0.94-1.72)	1.03(0.77-1.37)	0.98(0.67-1.37)	1.24(0.97-1.60)
▪ Physical Aggression	1.28(0.87-1.87)	0.97(0.64-1.47)	1.14(0.77-1.71)	1.05(0.75-1.47)
▪				
[3]*Participation in decision making*	0.98(0.69-1.39)	1.31(0.89-1.95)	1.18(0.78-1.79)	1.30(0.94-1.80)
[4]*Collaboration*				
▪ Nursing Director	0.79(0.55-1.14)	0.73(0.51-1.04)	0.68(0.47-0.99)*	0.99(0.74-1.34)
▪ Colleagues	0.65(0.41-1.04)	0.96(0.57-1.62)	1.67(0.89-3.14)	1.22(0.76-1.97)
[3]*Autonomy*	0.92(0.70-1.21)	0.66(0.50-0.87)**	0.95(0.68-1.31)	0.93(0.72-1.20)

[‡]Multiple regression models included all variables. The adjusted models were controlled for facility characteristics (language region, profit status, size) and care worker characteristics (gender, nursing job category, overtime frequency, employment percentage, professional experience in nursing in years, & shift work).
[1]Age groups (years)**:** 1=18 to 30; 2=31 to 40; 3=41 to 50; 4= older than 50. Groups 2, 3 and 4 are reported in comparison to group "1".
[2]Workplace violence: 0=never, less than once a week, approximately once a week; 1= several times a week, daily, several times a day; [3]Participation& autonomy: 0=strongly disagree, slightly disagree, 1=slightly agree, strongly agree; [4]collaboration: 0=very low, rather low; 1=rather high, very high; 2=Don't know. Group "1" is reported in comparison to group "0" (reference group). *p-value<0.05; **p<0.01

2.6 Discussion

This Swiss nursing home study reports on compromised physical and mental health outcomes among professional care workers in relation to selected psychosocial work environment factors. The most prevalent physical and mental outcomes were back pain and joint pain, and emotional exhaustion, tiredness, sleeplessness, and headache. Along with age, the psychosocial work environment factors such as work stressors and staffing adequacy showed a relationship with the physical and mental health care worker outcomes measured. Other factors that may be perceived as potential risk factors (e.g. percentage of residents with dementia, physical violence) or potential protective factors (e.g. participation in decision making) were not associated with the health of care worker outcomes examined.

The study findings about back pain and joint pain confirmed that musculoskeletal injuries rank high in nursing homes, in agreement with previous studies [11-13, 40]. In nursing homes, older people depend on the care provider to meet their daily needs such as bathing, toileting, eating, lifting, repositioning, and transferring [41]. The low prevalence rate of work-related allergies, including dermatitis, was inconsistent with a European study which revealed skin diseases are a prevalent problem in nursing homes [20], but confirmed results from a study conducted in Southern Taiwan [21] where dermatitis occurred less frequently in nursing home care workers. Although we found relatively few needle stick injuries they could still pose a serious hazard for nursing home care workers [22]. Furthermore, evidence showed that care workers underreport needle stick injuries [42] due to either lack of time [43] or due to their belief that needles were not contaminated [22]. We speculate that care workers may have underestimated both needle stick injuries and skin allergies. However, our assumption warrants further research for validation.

In addition to physical health, our study examined adverse mental health outcomes and showed that nearly one fourth of our sample reported emotional exhaustion, and between 10% and 14% tiredness, sleeplessness, and headaches, which is in line with other study findings [23, 26, 44]. It might appear plausible that the intensive nature of the labour and resident care in nursing homes can place care workers at risk of general fatigue, headaches, emotional and social dysfunction, and sleeplessness [44].

Psychosocial work environment factors showed an association with physical health outcomes. Specifically, high workload stress, conflict with other health professionals and lack of recognition stress, and perceptions of inadequate staffing were associated with back pain and joint pain. Consistent with our findings, in another study, care workers who experienced high workload were exposed to major risks for musculoskeletal injuries [11]. Some daily work processes that might explain include care workers experiencing conflict with colleagues, time pressure, and increased mechanical workload to meet resident care demands, which could increase awkward posturing and repetitive movement at work [45].

Verbal aggression of nursing homes residents towards care workers was also associated with back pain and joint pain, in agreement with a recent study [46]. Despite limited research investigating the association between workplace residents' verbal aggressiveness and physical injuries, there is some evidence showing that musculoskeletal pain/inflammation are more common among care workers exposed to verbal violence [46]. Other studies reported that verbal aggression against care workers can provoke considerable stress [46, 47]. A possible explanation for the association between verbal aggression and physical injuries is a muscle tension [46]. Our study precludes making any causal inferences in this regard, but indicates the need for further exploration.

Counter intuitively, we found that stress related to poor preparation for the job was associated with reduced self-reported back pain. A plausible explanation might be that those who have not received appropriate training in ergonomics might have low self-confidence in their skills, which may explain their lack of involvement in strain producing tasks, compared to those prepared. Yet, further investigation is necessary to validate these results, as no previous studies have examined this relationship to our knowledge.

Previous studies on geriatric care workers [48] found that the prevalence of back pain and other musculoskeletal pain increased with age, which was confirmed in our study for joint pain but not back pain. Contradictory results for the effect of age on care workers` health also exist and suggest that age is a poor predictor for back pain [49]. A plausible explanation of this inconsistency could be either that those who suffer from back pain tend to leave their work, or that care workers with older age have accumulated ergonomic skills, which protect them from back pain. This interpretation warrants further investigation.

Moreover, our findings suggested an association between stress related to workload and conflict with other health professionals and lack of recognition and mental health outcomes (sleeplessness, tiredness, headache, and emotional exhaustion). In addition, perceptions of greater staffing adequacy were associated with reduced odds of reporting tiredness. Similarly, while perceptions of strong leadership were associated with low-reported emotional exhaustion, high autonomy at work was associated with lower odds of reporting tiredness, and high collaboration with the nursing director was associated with lower odds of headache. In alignment with our findings, earlier studies have found that exposure to work stressors, including high workload and high job demands [27, 50, 51], lack of coworker [27, 51] and management [27] support, and low job autonomy [27, 51] were associated with poor mental health outcomes. This imbalance can be explained by Cannon`s Stress Theory [52], where prolonged exposure to stressors induce a disruptive biological system with the disruption preventing coping with changes, resulting in poor mental health outcomes such as sleeplessness, fatigue, headaches, and social and emotional dysfunction [44].

We also found that stress due to lack of job preparation was associated with an increased likelihood of reporting emotional exhaustion. Previous research has shown that on-the-job training

and mastery of skills can help manage demanding situations [53]. However, the reason for this finding in relation to reports of emotional exhaustion in our sample is unclear.

Finally, results showed that age is correlated to mental health outcomes. Sleeplessness was positively related to age, which may be explained by the slow down of the circadian rhythm with increased age, causing sleeping disorders [54]. However, tiredness, headache and emotional exhaustion were inversely related to increased age, which was supported by a previous US study on nursing mental health [55]. This may reflect the fact that older care workers have built confidence and professional skills that help them deal with difficult situations at work.

2.7 Strengths and limitations

The SHURP study is the first national representative survey to comprehensively survey health of care workers in Swiss nursing homes and to comprehensively examine the association between different factors of their work environment and physical and mental health outcomes. The findings of this study should, however, be interpreted in light of some limitations. First, the cross-sectional design did not allow us to make causal inferences about the relationships that were found. Nevertheless, our findings will inform stakeholders and future prospective studies about system factors associated with care workers health outcomes. Second, the secondary data analysis limited our ability to fully evaluate the impact of all domains of the proposed model (cf. Figure 1) on care workers` health. Third, the outcome variables used in this study were exclusively self-reported, which could be a source of bias. Yet, self-reported care workers' perception of health has been shown empirically to be a good indicator of health status [56]. For future research, the collection of more objective data or observer reported data are recommended, such as observation or medical examination of the physical and mental health of care workers. Fourth, the lack of a comparison group from the normal population does not allow contextual interpretation of the health findings. Finally, our cross sectional study prevented us from tracking care workers who have left their nursing home workplace due to worse health conditions, which may have led to an underestimation of reported poor care workers` health.

2.7 Conclusions

In conclusion, along with age, poor psychosocial work environmental factors in nursing homes were related to the physical and mental health of care workers. Modifying psychosocial work environment factors in Swiss nursing homes is a promising strategy to improve the health of their care workers. Longitudinal studies are needed to conduct targeted assessments of care workers health status, taking into account their age, along with the exposure to all four domains of the proposed model.

2.8 Funding/ Potential competing interests

No conflicts of interest declared. The Swiss Health Observatory, the Nursing Science Foundation Switzerland, the University of Basel Research fund 2012, and the Swiss Alzheimer Association funded The SHURP study. Additionally, the PhD Program in Health Sciences, University of Basel had granted the Start Stipend Award.

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2.10 References

1. Burton, J., WHO health workplace framework and model: background and supporting literature and practice. 2010, WHO Headquarters: Geneva, Switzerland.
2. OFS. Absence rate due to illness / accident of employees employed full-time by sex, nationality and occupancy rate. 2012 [cited 21.03.2014; Available from: http://www.bfs.admin.ch/bfs/portal/fr/index/themen/03/02/blank/data/06.Document.169536.xls.
3. BLS, Bureau of Statistics: News release. Employer reported workplace Injuries and illnesses-2012. 2013, US Department of Labor.
4. Cvejanov-Kezunovic, L., et al., Occupational exposure to blood among hospital workers in Montenegro. Archives of Industrial Hygiene and Toxicology, 2014. 65(3): p. 273-80.
5. Markovic-Denic, L., et al., Occupational exposure to blood and body fluids among health-care workers in Serbia. Med Princ Pract, 2014. 24(1): p. 36-41.
6. Sezgin, D. and M.N. Esin, Predisposing factors for musculoskeletal symptoms in intensive care unit nurses. Int Nurs Rev, 2015. 62(1): p. 92-101.
7. Taghinejad, H., et al., Occupational mental health: A study of work-related mental health among clinical nurses. J Clin Diagn Res, 2014. 8(9): p. Wc01-3.
8. Widmer, R., INTERIM RESULT : HOW DOES THE INTRODUCTION OF SwissDRG TO LONG-TERM CARE OFF. 2013, CURAVIVA: Switzerland.
9. Miller, A., et al., Evaluation of the effectiveness of portable ceiling lifts in a new long-term care facility. Appl Ergon, 2006. 37(3): p. 377-85.
10. Trinkoff, A.M., et al., Staffing and worker injury in nursing homes. Am J Public Health, 2005. 95(7): p. 1220-5.
11. Graham, P. and J.P. Dougherty, Oh, their aching backs!: occupational injuries in nursing assistants. Orthopaedic Nursing, 2012. 31(4): p. 218-223.
12. OSHA, Ergonomics for the prevention of musculoskeletal disorders, in Healthcare Risk Management. 2009, Occupational Safety and Health Administration: U.S. p. 1-40.
13. Qin, J., Kurowski, A., Gore, R., & Punnett, L. (2014). The impact of workplace factors on filing of workers' compensation claims among nursing home workers. *BMC Musculoskelet Disord, 15*(29), 2-9. doi: 10.1186/1471-2474-15-29.
14. Engels, J.A., A.J. van der Beek, and J.W. van der Gulden, A LISREL analysis of work-related risk factors and health complaints in the nursing profession. Int Arch Occup Environ Health, 1998. 71(8): p. 537-42.
15. Kamioka, H. and T. Honda, Low back pain in female caregivers in nursing homes., in Low Back Pain. 2012, InTech.
16. Park, R.M., et al., Impact of publicly sponsored interventions on musculoskeletal injury claims in nursing homes. Am J Ind Med, 2009. 52(9): p. 683-97.

17. Ribeiro, S.B., M.C. Càrdia, and L.C. Almeida, Biomechanical and organizational risk and prevalence of low back pain in the old adults caregivers of a nursing home in Joao Pessoa/PB. Work, 2012. 41(Suppl 1): p. 1933-1939.
18. Khatutsky, G., Wiener, J.M., Wayne L. A., & Porell, F.W, Work-related injuries among certified nursing assistants working in US nursing homes. 2012, Research Triangle Park: NC. p. 18.
19. Clarke, S.P., M. Schubert, and Ko¨rner T., Sharp-device injuries to hospital staff nurses in 4 countries. Infect Control Hosp Epidemiol, 2007. 28(4): p. 473-478.
20. Hasselhorn, H.M., et al., Prevalence of skin disease in the nursing profession - results from the European NEXT-study. Ergonomia, 2008. 30(4): p. 271-283.
21. Smith, D.R., et al., Prevalence of skin disease among nursing home staff in southern Taiwan. Ind Health, 2002. 40(1): p. 54-8.
22. Alamgir, H., et al., Needlestick and other potential blood and body fluid exposures among health care workers in British Columbia, Canada. Am J Infect Control, 2008. 36(1): p. 12-21.
23. McCaughey, D., et al., The relationship of positive work environments and workplace injury: evidence from the National Nursing Assistant Survey. Health Care Manage Rev, 2014. 39(1): p. 75-88.
24. Lazarus, R.S., Progress on a cognitive-motivational-relational theory of emotion. Am Psychol, 1991. 46(8): p. 819-34.
25. Eatough, E.M., J.D. Way, and C.H. Chang, Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints. Appl Ergon, 2012. 43(3): p. 554-63.
26. Peters, V.P., A.E. de Rijk, and N.P. Boumans, Nurses' satisfaction with shiftwork and associations with work, home and health characteristics: a survey in the Netherlands. J Adv Nurs, 2009. 65(12): p. 2689-700.
27. Willemse, B.M., et al., The moderating role of decision authority and coworker- and supervisor support on the impact of job demands in nursing homes: a cross-sectional study. Int J Nurs Stud, 2012. 49(7): p. 822-33.
28. Pai, D.D., et al., Violence, Burnout and Minor Psychiatric Disorders in Hospital Work. Rev Esc Enferm USP, 2015. 49(3): p. 457-64.
29. Neira, M., Healthy workplaces: a model for action. For employers, workers, policy-makers and practitioners. 2010, Wolrd Health Organization: Geneva, Switzerland.
30. Schwendimann, R., et al., Swiss Nursing Homes Human Resources Project (SHURP) protocol of an observational study. J Adv Nurs, 2013. 70(4): p. 915-926.
31. OFS, Swiss Health Survey 2012. 2012, Federal Department of Home Affairs: Switzerland.
32. Schubert, M., et al., RICH Nursing Study. 2009, Basel: Institut für Pflegewissenschaft, Universität Basel: Switzerland.

33. Maslach, C., W.B. Schaufeli, and M.P. Leiter, Job burnout. Annual Review of Psychology, 2001. 52(1): p. 397-422.
34. Akhtar, S., Lee, J.S., Confirmatory factor analysis and job burnout correlates of the Health Professions Stress Inventory. Psychological Reports 2002. 90(1): p. 243-250.
35. Wolfgang, A.P., The Health Professions Stress Inventory. Psychological Reports, 1988. 62(1): p. 220-222.
36. Lake, E.T., The nursing practice environment: measurement and evidence. Med Care Res Rev, 2007. 64(2(suppl)): p. 104S-22S.
37. Sexton, J.B., et al., The Safety Attitude Questionnaire: psychometric properties, benchmarking data, and emerging research. BMC Healh Services Reasearch, 2006. 6(44).
38. Oh, H., M. Eom, and Y. Kwon, A study on aggressive behavior among nursing home residents with cognitive impairment. Journal of Korean Academy of Nursing, 2004. 34(8): p. 1451-1459.
39. Field, A., Discovering Statistics Using SPSS. Third Edition ed. 2009, London: SAGE.
40. Alamgir, H., et al., Efficiency of overhead ceiling lifts in reducing musculoskeletal injury among carers working in long-term care institutions. Injury, 2008. 39(5): p. 570-7.
41. Simon, M., et al., Back or neck-pain-related disability of nursing staff in hospitals, nursing homes and home care in seven countries--results from the European NEXT-study. Int J Nurs Stud, 2008. 45(1): p. 24-34.
42. Kiss, P., M. De Meester, and L. Braeckman, Needlestick injuries in nursing homes: the prominent role of insulin pens. Infect Control Hosp Epidemiol, 2008. 29(12): p. 1192-4.
43. Shiao, J.S., et al., Prevalence of nonreporting behavior of sharps injuries in Taiwanese health care workers. Am J Infect Control, 1999. 27(3): p. 254-7.
44. Khamisa, N., et al., Work related stress, burnout, job satisfaction and general health of nurses. Int J Environ Res Public Health, 2015. 12(1): p. 652-66.
45. Ando, S., et al., Associations of self estimated workloads with musculoskeletal symptoms among hospital nurses. Occup Environ Med, 2000. 57(3): p. 211-216.
46. Sabbath, E.L., et al., Occupational injury among hospital patient-care workers: what is the association with workplace verbal abuse? Am J Ind Med, 2014. 57(2): p. 222-32.
47. Rodwell, J. and D. Demir, Addressing workplace violence among nurses who care for the elderly. J Nurs Adm, 2014. 44(3): p. 152-7.
48. Dulon, M., et al., Prevalence of skin and back diseases in geriatric care nurses. Int Arch Occup Environ Health, 2008. 81(8): p. 983-92.
49. Yip, Y., A study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. J Adv Nurs, 2001. 36(6): p. 794-804.

50. Piko, B.F., Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: a questionnaire survey. Int J Nurs Stud, 2006. 43(3): p. 311-8.
51. Malinauskiene, V., P. Leisyte, and R. Malinauskas, Psychosocial job characteristics, social support, and sense of coherence as determinants of mental health among nurses. Medicina (Kaunas), 2009. 45(11): p. 910-7.
52. Cannon, W.B., A law of denervation. Amer. J. Med. Sci, 1939. 198: p. 737–749.
53. Rudman, A. and J.P. Gustavsson, Early-career burnout among new graduate nurses: a prospective observational study of intra-individual change trajectories. Int J Nurs Stud, 2011. 48(3): p. 292-306.
54. Harma, M.I. and J.E. Ilmarinen, Towards the 24-hour society--new approaches for aging shift workers? Scand J Work Environ Health, 1999. 25(6): p. 610-5.
55. Letvak, S., Health and safety of older nurses. Nurs Outlook, 2005. 53(2): p. 66-72.
56. Palmer, K.T., et al., Population-based cohort study of incident and persistent arm pain: role of mental health, self-rated health and health beliefs. Pain, 2008. 136(1-2): p. 20-37.

CHAPTER 3

ABSENTEEISM AND PRESENTEEISM AMONG CARE WORKERS IN SWISS NURSING HOMES AND THEIR ASSOCIATION WITH PSYCHOSOCIAL WORK ENVIRONMENT: A MULTISITE CROSS-SECTIONAL STUDY

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3.1 Abstract

Background: Worker productivity is central to the success of an organization such as health care institutions. However, both absenteeism and presenteeism impair that productivity. While various hospital studies have examined the prevalence of presenteeism and absenteeism and its associated factors among care workers, evidence from nursing home settings is scarce.

Objective*:* To explore care workers' self-reported absenteeism and presenteeism in relation to nursing homes' psychosocial work environment factors.

Methods: A cross-sectional study utilized survey data of 3,176 professional care workers in 162 Swiss nursing homes collected between May 2012 and April 2013. A GEE ordinal logistic regression model was used to explore associations between psychosocial work environment factors (leadership, staffing resources, work stressors, affective organizational commitment, collaboration with colleagues and supervisor, support from other personnel, job satisfaction, job autonomy) and self-reported absenteeism and presenteeism.

Results: Absenteeism and presenteeism were observed in 15.6% and 32.9% of care workers, respectively. While absenteeism showed no relationship with the work environment, low presenteeism correlated with high leadership ratings (OR 1.22, CI 1.01-1.48) and adequate staffing resources (OR 1.18, CI 1.02-1.38).

Conclusion: Self-reported presenteeism is more common than absenteeism in Swiss nursing homes, and leadership and staffing resource adequacy are significantly associated with presenteeism, but not with absenteeism.

3.2 Introduction

Worker productivity is central to the success of any organization [1]. However, both absenteeism, i.e., missing shifts because of feeling unwell or unfit to work, and presenteeism, i.e., working despite feeling unwell or unfit to work, impair that productivity. With absenteeism, as employees contribute nothing to the organization's operation, productivity loss per absent employee is 100% [2]. Presenteeism is considered the opposite of absenteeism [3] but it decreases productivity making illness at work a costly affair [1, 4]. The two concepts are closely linked: frequent presenteeism is associated with subsequent long-term absenteeism [5].

The concept of presenteeism first appeared in empirical literature in the 1990s, [6] when employers noticed that not only absenteeism but also presenteeism drains productivity [7]. Since then, studies on the general population have indicated that both absenteeism and presenteeism are strong predictors of future poor health, physical complaints, low mental well-being, and low work ability [8].

In healthcare, previous studies have shown that high rates of presenteeism are common among nursing care workers, regardless of their work setting [9-11]. For example, in 2011, 49% of the Swedish public health sector workers (including hospitals and primary care workers) reported frequent presenteeism in the preceding year [12].

Research [9, 11, 13] has suggested that the ability to work through illness depends on work demands, workload, and perceived job stress. Hence, if the ill person perceives that co-workers will not be able to compensate for their absence, they commonly work despite illness [9, 13]. For example, care workers' daily responsibilities involve providing service and responding to patients' needs. If the ill persons perceive that the care workers present will not be able to compensate for their absence, they commonly work despite illness [9, 14]. In nursing homes, residents who can no longer reliably perform the basic activities of daily living in their homes require 24/7 direct care. As a result, nursing home care workers need to perform many physically and emotionally straining activities that risk compromising their health [15].

Several studies on the general population have indicated relationships between absenteeism and presenteeism [13, 16]. Workers who reported calling in sick also tended to report working while ill [13]. Individual characteristics such as occupation and gender [10], and work related factors including a strong commitment to work [13] were found to influence both absenteeism and presenteeism [17]. Recent studies have linked negative perceptions of the work environment [18] – e.g., poor collaboration with colleagues [19] and time pressure [13, 20] with presenteeism. In a Scandinavian study on the care of older people, researchers showed that high presenteeism was associated with high workloads and elevated time pressure [11].

Compared to absenteeism, presenteeism has been relatively less researched, probably because it is harder to track associated cost [21]. Nonetheless, existing studies have highlighted the

magnitude of presenteeism not only by its cost of lost productivity, but also by negatively affecting quality patient care [21]. While various hospital studies in Europe and the U.S. have examined the prevalence of presenteeism (ranging from 21.9% to 62%), and its associating factors [14, 19, 21], evidence from nursing home settings is scarce. Although the relationships between absenteeism and presenteeism are unclear, Kristensen argued convincingly that both behaviours are outcomes of the same decision process [22]. Therefore, examining risk factors for absenteeism in nursing home care workers' psychosocial work environments (e.g., leadership, collaboration with supervisor, work stressors, staffing resources) could improve our perception of presenteeism [13]. This study adds to the body of knowledge on absenteeism, and to the growing literature on presenteesim in healthcare.

3.3 Theoretical background

The WHO Healthy Workplace Model **(figure 1)** [1] and its "Business Case" framework (**figure 2)** [1] contribute to the understanding of the work environment's relationships with absenteeism and presenteeism. All workplaces require healthy workers to sustain the organization [1]. Therefore, the WHO model ties unhealthy and unsafe workplaces to work-related physical and mental illnesses, very likely increasing the risks of both absenteeism and presenteeism. The WHO's key components of a healthy workplace correspond to four domains: 1) the physical work environment (e.g. chemical hazards and biological hazards); 2) the psychosocial work environment (e. g organization daily practices and workplace stressors); 3) personal health resources (e.g. physical inactivity from long working hours, poor diet due to lack of time); and 4) enterprise community involvement (e.g. supporting community screening and treatment, providing leadership and expertise related to workplace health and safety to other organizations). Using data from the Swiss Nursing Homes Human Resources Project (SHURP), we explored psychosocial work environment factors' associations with absenteeism and presenteeism in nursing home care workers. Rooted in organizational culture and daily practice, these factors can include, among others, work stressors, staffing resource inadequacy, poor leadership, poor co-worker support, poor collaboration with management or among colleagues, low job autonomy, low job satisfaction, and poor affective organizational commitment [1]. The variables are defined by the WHO model but operationalized to meet the study purposes.

Figure 1. The WHO Model of Healthy Workplace (own figure). Adopted from Borton (2010) [1].

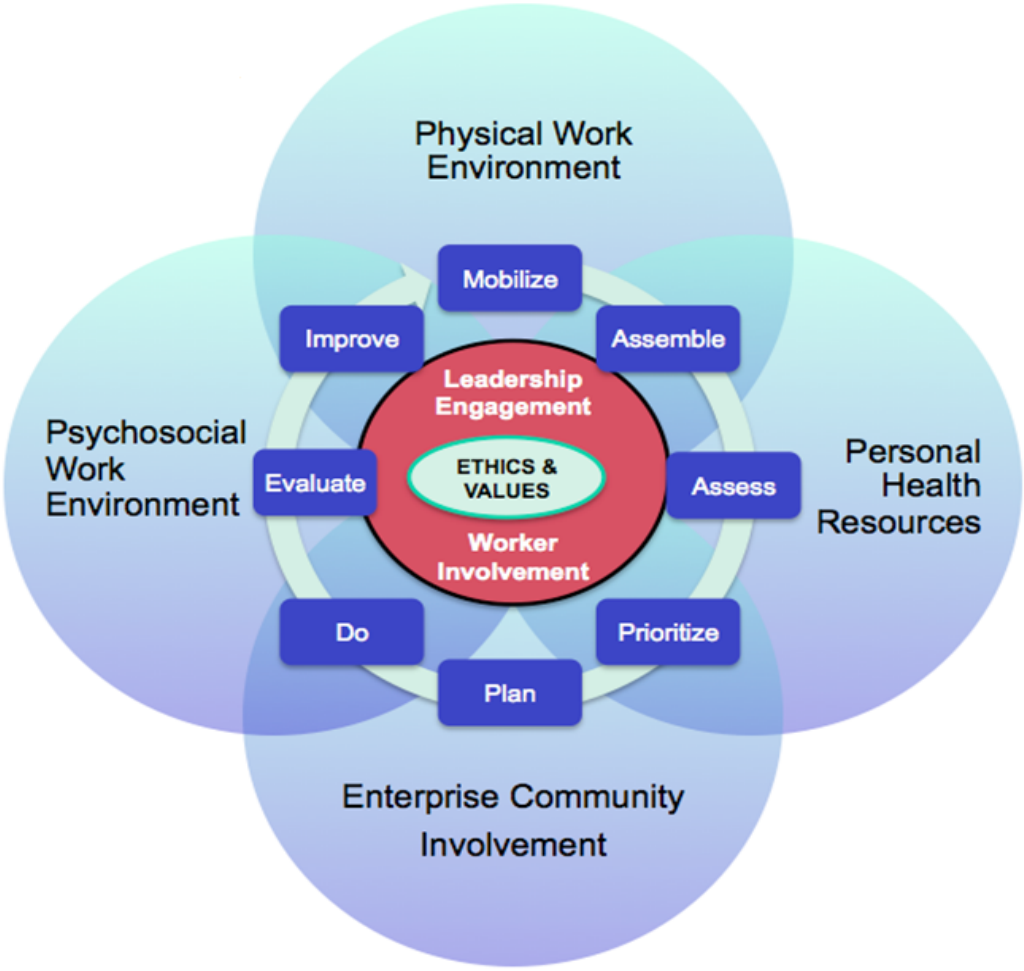
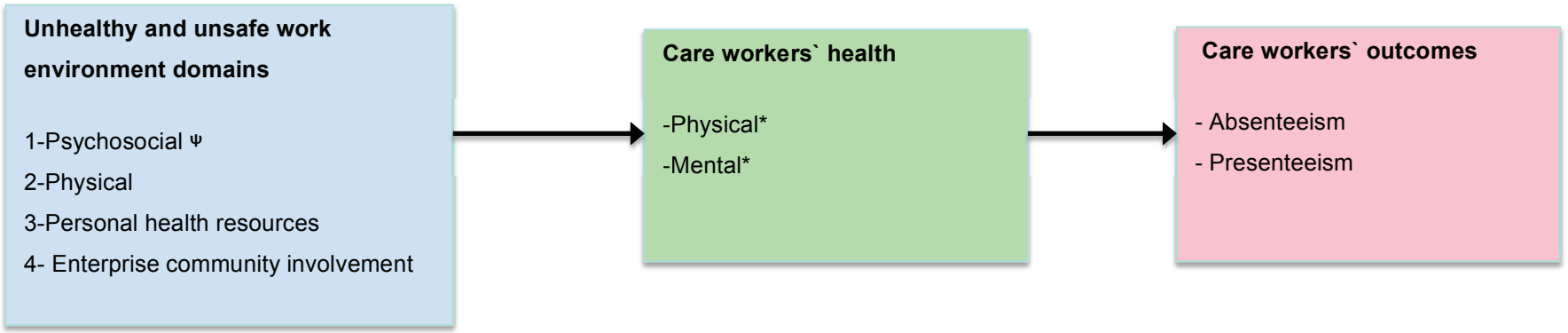


Figure 2. The WHO conceptual framework for business case, adopted from Burton (2010) [1].



Ψ Explanatory variables

***Control variables**

Exploring absenteeism and presenteeism in nursing homes serves two important purposes. First, determining the prevalence of each provides insight into their magnitude as nursing workforce outcomes in long-term care settings. Second, as work environment factors can influence employee productivity–via absenteeism and presenteeism–they also influence an organization's sustainability [1]. Accordingly, this study had two aims: 1) to determine the prevalence of absenteeism and presenteeism among professional care workers in Swiss nursing homes; and 2) to explore psychosocial work environment factors' associations with absenteeism and presenteeism.

3.4 Methods

3.4.1 Study design, setting, and sample

This is a secondary data analysis of the multi-center, cross-sectional SHURP study, which included a random sample of 162 nursing homes across Switzerland, stratified according to language region and size. Nursing homes smaller than 20 beds, residential care homes, and rehabilitation clinics for geriatric patients were excluded. Full details of the sampling and survey methods used are provided elsewhere [23].

In the parent study, 6,947 questionnaires were distributed to care workers, of which 5,323 (76.6%) were returned. Care workers of all educational levels (registered nurses, licenced practical nurses, certified nursing assistants, and nurse aides) who provided direct care to the nursing home residents were invited to complete the questionnaire survey. Care workers who worked fewer than 8 hours weekly, had been employed less than 1 month on the unit, or were students were excluded from the parent study. In the current study, only care workers without leadership positions were included, leading to a sub-sample of 3,176 professional care workers.

3.4.2 Data sources, variables and measurements

Socio-demographic and professional data on care workers, including their perceptions of their work environment, work stressors, health status, absenteeism, and presenteeism, were collected using the SHURP study's Care Worker Personnel Questionnaire. Nursing home facility characteristics were captured from the SHURP Facility Profile.

The SHURP study team established the content validity of each scale used, testing the relevance of each variable and scale separately and adjusting them as necessary until all achieved desirable item content validity index (I-CVI) or scale content validity index (S-CVI) ratings.

All items of the care worker questionnaire were translated into German, French, and Italian. Items were verified with the original language version by comparison of its back translation. Then, they were tested for relevance with gerontological experts in the field to check content validity, and

pre-tested for their comprehensibility with end-user focus group. Further information related to the development of the questionnaire and the survey validity pre-testing are described elsewhere [23].

3.4.3 Variables and measurements

The current study used the following dependent, independent and control variables.

Dependent Variables

Absenteeism

Absenteeism was measured via an investigator-developed item measuring how many days (if any) in the previous 4 weeks care workers had not attended work due to feeling ill and unfit for work. Respondents answered by number of days. Numbers were later grouped into three categories (0=0 days, 1=1-2 days, 2=3 or more days) as in presenteeism [10].

Presenteeism

Presenteeism was measured via an investigator-developed item measuring how many days (if any) in the previous 4 weeks care workers had attended work in spite of feeling ill and unfit for work. Respondents answered by number of days. Answers were later grouped into three categories (0=0 days, 1=1-2 days, 2=3 or more days)[10].

Independent Variables

Psychosocial work environment risk factors

Care workers' perceptions of their nursing homes' leadership and staffing adequacy were measured via items from two subscales of the Practice Environment Scale of the Nursing Work Index (PES-NWI) questionnaire: "Nurse manager ability, leadership, and support of care workers" (Cronbach alpha 0.84) and "Staffing and resources adequacy" (Cronbach alpha 0.74)[24]. These were adapted for nursing home use with 4-point Likert-type scale (1=strongly disagree, 2=rather disagree, 3=rather agree, 4=strongly agree). The leadership items asked about the extent to which respondents perceived their unit supervisors as supportive and competent leaders, mistakes were used as learning opportunities, care workers were rewarded or otherwise recognized for work well done, and the unit leaders supported them in decision making. Items on staffing adequacy asked about perception of enough staff on duty to complete all necessary work, to provide quality care, and to discuss resident problems.

Work stressor items were selected from the Health Professions Stress Inventory (HPSI) [25, 26] to measure the frequency of several work-related stressors. These were measured via a 5-point Likert-type scale (0=never, 1=seldom, 2=sometimes, 3=often, 4=very often). The instrument was reduced from 30 to 12 items in order to reduce the SHURP`s survey burden (time spent filling out questionnaires). The reduction was based on the ratings of experts from the gerontological field (holding at least a Certificate of Advanced Studies up to a Master's degree with experience in nursing home care) with regards to the relevance of each question. The SHURP team asked the experts to rate each item for its understandability for nursing home personnel (yes/no), and for its relevance concerning resident safety on a 4-point scale (1=not relevant, 2=somewhat relevant, 3=quite relevant, 4=very relevant). The item content validity index (I-CVI) was calculated for each item as percentage of experts who rated it 3 or 4. The average scale content validity (S-CVI/Ave) was calculated as the mean of all I-CVI. The SHURP group's psychometric analysis of the remaining 12 items produced 3 sub-scales tested for internal consistency (Cronbach`s alpha) and measuring stress-producing factors: (1) workload (Cronbach's alpha: 0.73), (2) lack of job preparation (Cronbach's alpha 0.63), and (3) conflict and lack of recognition (Cronbach's alpha 0.76). Stress due to workload was measured via three items on dealing with difficult situations, having too much work to do, and being understaffed. The three items measuring stress due to lack of job preparation asked about fear of making mistakes, being overwhelmed when caring for terminally ill residents, and not being prepared to meet the residents' needs. Regarding conflict and lack of recognition, six items asked about disagreements with other professionals, conflicts with superiors, lack of information, not being asked about one's opinion, being underpaid, and underuse of skills.

Affective organizational commitment was adopted from the "Questionnaire for the Assessment of Affective, Costing, and Normative Commitment to the Organization, the Profession/Activity and Employment Form" (COBB)[27], using five items from the Affective Commitment sub-scale (Cronbach`s alpha 0.86), and rated on a 5-point Likert-type scale (1=strongly disagree, 2=slightly disagree, 3=neutral, 4=slightly agree, 5=strongly agree). These items assessed respondents' feelings about the organizations employing them, including how happy they would be to spend the next years with their current organization, the strength of their sense of belonging to that organization, their level of emotional attachment to their organization, and how well their personal ideals fit with those of the organization.

Items on collaboration with colleagues and with unit supervisors were adopted from the Safety Attitude Questionnaire (SAQ)[28]. On 4-point Likert-type scales, respondents rated the quality of each level of collaboration (1=very low, 2=rather low, 3=rather high, 4=very high). A "don't know" option was also provided (treated as missing in the analysis). For conformity with the study's data on risk factors, answers were dichotomized (0=very low, rather low; 1=rather high, very high). One item on support from other personnel to care for residents was also selected from the SAQ and rated on a

5-point Likert-type scale (1=strongly disagree, 2=slightly disagree, 3=neutral, 4=slightly agree, 5=strongly agree). This also included the "don't know" answer option. As above, answers were dichotomized for data conformity (0= strongly disagree, slightly disagree, neutral; 1=slightly agree, strongly agree).

To measure autonomy at work, a single investigator-developed item asked care workers to rate the extent to which they decided independently how to perform their work. This item was rated on a 4-point Likert-type scale (1=strongly disagree, 2=slightly disagree, 3=slightly agree, 4=strongly agree). Again, responses were dichotomized (0=strongly disagree, slightly disagree; 1= slightly agree, strongly agree). Job satisfaction was measured via another investigator-developed item. On a 4-point Likert-type scale (1=very dissatisfied, 2=rather dissatisfied, 3=rather satisfied, 4=very satisfied), this assessed each care worker's overall satisfaction with his/her current job in the nursing home. As above, answers were dichotomized as positive or negative (0=very dissatisfied, rather dissatisfied; 1=rather satisfied, very satisfied).

Control Variables

Facility characteristics

Facility characteristics included size (small: 20-49 beds; medium: 50-99 beds; or large: ≥100 beds), language region (German-, French-, or Italian-speaking area), and ownership status (private, private subsidized, public).

Care worker socio-demographic and professional characteristics

Care worker socio-demographic data were collected on age (date of birth), gender, educational level (i.e., registered nurse, licensed practical nurse, certified nursing assistant, nurses aide), professional experience in nursing in years (number of years in nursing), percentage of full-time employment (corresponding to number of hours worked per week, ranging from 20% (8hrs/week) to 100% (42hrs/week)), agency staff (i.e., a temporary (vs. permanent) position), usual work shifts (days, evenings, nights, or regularly rotating shifts), and frequency of overtime (less frequently, every 5-7 working days, every 2-4 working days, almost every shift). Age (up to 30 years; 31-40; 41-50; >50 years) and professional experience in nursing (up to 5 years; 6-10 years; 11-15 years; 16-20 years; >20 years) were then categorized for analysis purposes. Professional categories were based on 5 nursing education levels: registered nurses (three to six years of education, leading to a diploma in nursing, bachelor's degree (BSc.N. or equivalent) or higher); licensed practical nurses (LPN) (three years of education); certified nursing assistants (CNA) (two years of education); and nurse aides (short courses or on-the-job training).

Care worker health status

Care workers' physical health status was assessed using a health index designed to minimize the number of health-related outcome variables. Five items were selected from the Swiss Health Survey [29] to gather self-reported data on back pain, joint pain, tiredness, sleeplessness, and headache during the preceding 4 weeks, with each measured on a 3-point Likert-type scale (1=not at all, 2=a little bit, 3=strongly). The index score was calculated as sum of item scores (range: 5-15) over number of items (n=5) minus 5 (allowing the index to start with 0 for "no health complaints"). Higher index scores (max: 10) signify more health problems. This index is based on principal component analysis of the 5 items, with one factor explaining 45% of the variance. Item loadings ranged between 0.62 and 0.74 (Cronbach`s alpha 0.69).

The care worker`s mental health status-emotional exhaustion–was measured on a 7-point Likert-type scale (ranging from 0=never, to 6=daily) using the item "feeling exhausted from work" from the Maslach Burnout Inventory (MBI)[30]. The validity of measuring emotional exhaustion with a single item is described elsewhere [31].

3.4.4 Data collection and Analysis

The SHURP survey was administered between May 2012 and April 2013. Detailed information on data collection is provided elsewhere [23].

As facility and care worker characteristics, including health status, have been extensively investigated in previous studies, showing positive relationships with absenteeism and presenteeism, they were used here as control variables [19, 32]. To address aim 1, we calculated descriptive statistics (frequencies, percentages, means, and standard deviations). For aim 2, we first analyzed the univariate associations between facility and care worker characteristics (including health status) and absenteeism and presenteeism. We used generalized estimation equation (GEE) multiple regression models to account for the clustering of care workers in nursing home units. Next, adjusting for facility characteristics and care worker characteristics (including health status), we used ordinal logistic GEE regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for psychosocial work environment risk factors. We also assessed multi-collinearity of all work environment factors with variance inflation factor (VIF). Based on this VIF with all values remaining below the threshold of 5, all variables were included in the analysis[33]. Missing values analysis showed less than 5% of responses missing per variable, with approximately 23% of respondents (n=938) omitting one or more responses. To explore any pattern of missed data, we analysed the sensitivity of the entire sample (n=4,014) against that of the subgroup who submitted complete response sets (n=3,176). To compare means of each variable examined in this study, we calculated Cohen's d. Calculated differences were small (Cohen's d<0.2)[34], with similar inferences. All data

analyses were conducted using IBM/SPSS for Mac Statistics 21.0. We report only adjusted results of our analysis.

3.4.5 Ethical approval

All participating nursing home administrators and nursing directors gave written informed consent to participate in the SHURP study. Care workers' voluntary and confidential return of their SHURP questionnaires was treated as informed consent. This study was covered by the Swiss nursing homes human resources Project (SHURP), for which the ethic committee of the state of 'Beider Basel' (Ref. Nr. EK:02/12) granted approval.

3.5. Results

3.5.1 Description of sample

Overall, this study included data supplied by 3'176 care workers in 162 nursing homes. Slightly fewer than half of participating nursing homes were medium in size (46.3%); one third had public ownership (37%). Three-quarters (75.9%) were located in Switzerland's German-speaking area. Table 1 summarizes the participants' characteristics and psychosocial work environment factors.

Across all facilities, a large majority (92.2%) of care workers were female; fewer than a third were registered nurses (27.9%). Roughly a third (32.7%) were 50 years of age or older and roughly a quarter (24.6%) had 21 or more years of nursing experience. The majority (75.3%) were employed more than 50% and not working for an agency (93.7%). Fewer than half (44.7%) reported working mostly day shifts. Slightly more than a third (37.7%) reported incidences of work-related emotional exhaustion ranging from several times a month to daily. Overall, respondents reported positive psychosocial work environments, with high levels of collaboration both among colleagues (96.0%) and with unit supervisors (90.6%), strong levels of support from other personnel (88.8%), autonomy at work (81.1%), and job satisfaction (87.5%).

Table 1. Facility and care worker characteristics and psychosocial work environment factors

Facility characteristics	**n (%)**	**Means (SD)**
Language speaking region		
German	123 (75.9)	
French	30 (18.5)	
Italian	9 (5.6)	
Profit status		
Public	60 (37.0)	
Private subsidized	43 (26.5)	
Private	59 (36.4)	
Nursing home size		
Small (20-49beds)	63 (38.9)	
Medium (50-99 beds)	75 (46.3)	
Large (≥100 beds)	24 (14.8)	
Care worker characteristics		
Gender		
Male	248 (7.8)	
Female	2928 (92.2)	
Age groups (years)		
Up to 30	680 (21.4)	
31-40	578 (18.2)	
41-50	878 (27.6)	
>50	1040 (32.7)	
Professional category		
Registered Nurse	887(27.9)	
Licensed practical nurse	744 (23.4)	
Certified nursing assistant	613 (19.3)	
Nurse Aide	932 (29.3)	

Employment percentage		
Up to 50%	784 (24.7)	
>50%	2392 (75.3)	
Agency Staff		
Yes	201 (6.3)	
No	2975 (93.7)	
Experience in nursing (years)		
Up to 5	660 (20.8)	
5 to 10	731 (23.0)	
11 to 15	593 (18.7)	
16 to 20	412 (13.0)	
>20	780 (24.6)	
Usual shift		
Days only	1421 (44.7)	
Evenings only	198 (6.2)	
Nights only	391 (12.3)	
Regular change of shifts	1166 (36.7)	
Overtime frequency		
Less frequently	2423(76.3)	
Every 2-4 working days	251 (7.9)	
Every 5-7 working days	443 (13.9)	
Almost every shift	59 (1.9)	
Care workers reported health status		
Emotional Exhaustion		
Never, several times a year or less, once a month or less,	1978 (62.3)	
Several times a month, once a week, several times a week, daily	1198 (37.7)	
Health Index1		3.47 (2.24)
Psychosocial work environment		
Leadership		3.14 (0.60)

Staffing resources		2.82 (0.66)
Work Stressors		
Workload		1.54 (0.82)
Conflict and lack of recognition		0.90 (0.66)
Lack of job preparation		0.67 (0.58)
Affective organizational commitment		3.84 (0.82)
Collaboration with colleagues		
Very low, rather low	127 (4.0)	
Rather high, very high	3049 (96.0)	
Collaboration with unit supervisor		
Very low, rather low	300 (9.4)	
Rather high, very high	2876 (90.6)	
Support from other personnel		
Strongly disagree, slightly disagree, neutral	355 (11.2)	
Slightly agree, strongly agree	2821 (88.8)	
Autonomy		
Strongly disagree, slightly disagree	601 (18.9)	
Slightly agree, strongly agree	2575 (81.1)	
Job satisfaction		
Very dissatisfied, rather dissatisfied	396 (12.5)	
Rather satisfied, very satisfied	2780 (87.5)	

[1]Health index included self reported back pain, joint pain, tiredness, sleeplessness, and headache during the past 4 weeks prior to the survey.

3.5.2 Prevalence of absenteeism and presenteeism among care workers

Of the 3,176 care workers who submitted eligible questionnaires, 14.6% reported absenteeism, with 32.9% reporting presenteeism for at least one shift during the month prior to the survey (**Table 2)**; 5.6% reported three or more days of absenteeism; and 16.8% reported three or more days of presenteeism. Conversely, 85.4% and 67% of all participants respectively reported zero days of either absenteeism or presenteeism.

Table 2**. Prevalence of absenteeism and presenteeism, n (%)**

Care worker reported	Absenteeism	Presenteeism
0 days	2713 (85.4)	2129 (67.0)
1 to 2 days	285 (9.0)	512 (16.1)
≥3 days	178 (5.6)	535 (16.8)
Total of 1 and more days	463 (14.6)	1047 (32.9)

3.5.3 Associations of psychosocial work environment factors with absenteeism and presenteeism

Absenteeism showed no significant association with any psychosocial work environment factor investigated in this study. However, presenteeism was associated with two psychosocial work environment risk factors **(Table 3)**: perceptions of supportive leadership (OR 1.22, CI 1.01-1.48) and adequate staffing resources (OR 1.18, CI 1.02-1.38) both increased the odds of low presenteeism. No other associations with psychosocial work environment factors were statistically significant.

Table 3. Association between work environment factors and absenteeism and presenteeism

Psychosocial work environment	Absenteeism[1] OR[2] (95% CI)	Presenteeism[1] OR[2] (95%CI)
Leadership	1.01 (0.78-1.31)	1.22 (1.01-1.48)*
Staffing resources	0.85 (0.69-1.04)	1.18 (1.02-1.38)*
Work Stressors		
Workload	1.03 (0.86-1.23)	1.01 (0.88-1.16)
Conflict & lack of recognition	0.98 (0.79-1.22)	0.85 (0.71-1.01)
Lack of job preparation	1.13 (0.90-1.40)	0.93 (0.79-1.09)
Affective organizational commitment	1.12 (0.94-1.34)	0.90 (0.78-1.04)
[3]Collaboration with colleagues		
Rather high, very high	1.33 (0.84-2.12)	1.06 (0.70-1.60)
[3]Collaboration with unit supervisor	0.88 (0.59-1.33)	0.75 (0.55-1.03)
[3]Support from other personnel to care for residents	0.9 (0.65-1.25)	1.02 (0.78-1.33)

[3]Autonomy at work	0.98 (0.74-1.29)	1.03 (0.84-1.26)
[3]Job satisfaction	1.26 (0.89-1.78)	1.17 (0.87-1.56)

[1]Absenteeism & presenteeism: 0=none; 1= 1 to 2 days; 2=3 & more days. The analysis models the probabilities having lower presenteeism values.
[2]The adjusted ordinal regression models were controlled for facility characteristics (language region, profit status, size) and care worker characteristics (gender, age, professional category, agency staff, employment percentage, experience in nursing, usual shift, overtime frequency; health status: health index, emotional exhaustion).
[3]Collaboration with colleagues & with supervisor: 0=very low, rather low; 1=rather high, very high; Support from other personnel: 0= strongly disagree, slightly disagree, neutral; 1=slightly agree, strongly agree; Autonomy at work: 0= strongly disagree, slightly disagree; 1= slightly agree, strongly agree; Job satisfaction:0= very dissatisfied, rather dissatisfied; 1=rather satisfied, very satisfied. Group “1” is being reported for the explanatory variable in reference to group “0”. *p-value >0.05, **p-value >0.01

3.6 Discussion

While this study found no significant associations between psychosocial work environment risk factors and self-reported absenteeism, analyses indicated that both perception of supportive leadership and staffing resource adequacy correlated with lower self-reported presenteeism. While our findings on absenteeism do not support previous research, our measured 37% prevalence of self-reported presenteeism [10] is congruent with earlier observations [10, 14].

Overall, nursing home care workers' self-reported presenteeism in the month prior to the survey was more common than similarly reported absenteeism over the same period. While the prevalence of self-reported absenteeism of three and more days was fairly low (5.6%), it was slightly higher than that self-reported for US healthcare workers in the same year (2012) (4.5%)[35]. Unfortunately, the US findings provided no nursing home-specific figures. Also, US healthcare workers may not enjoy the same protections as in the Switzerland, where missing a shift may entail losing a day`s pay.

Comparing various occupations of the general population in Sweden (e.g., care providers and school teachers), Aronsson et al. (2000) observed higher presenteeism among female healthcare workers compared with female workers in other occupations [10]. This supports Szymczak, J.E., et al.'s (2015) conclusion that the nature of a caring relationship between the care worker and the patient decreases the likelihood of absenteeism and magnifies the tendency to work while ill [14], and John's (2010) postulation that the work identity of the care worker is linked to helping the vulnerable patient [36]. Recent findings in one US hospital suggested that care workers were ambivalent both about which symptoms and illnesses constituted being too sick to work, and about whether their organizations' sickness relief systems were adequate [14].

As noted above, in contrast to previous studies on predictors of absenteeism in nursing homes [37, 38], we found no association between psychosocial work environment and self-reported absenteeism. While the perception of a supportive leadership, supportive peer relationships [37, 38], appropriate job training, job satisfaction [38], and affective organizational commitment[39] have all been linked to reduced rates of absenteeism in other European healthcare settings, this study confirmed no such relationships. However, in accordance with one study [20], we found that job satisfaction did not influence the probability of absenteeism. A plausible explanation for inconsistent study findings would be the broad range of workplace cultures, social, legal, and economic contexts involved. Varying from one country or culture to another, all these factors impact the traditions and practices of healthcare workers, potentially influencing their attitudes towards absenteeism [10].

Our findings suggest that absenteeism cannot be fully explained by care workers' work attitudes [27, 40]. For example, personal factors such as health status have been found to predict the probability of absenteeism [20] and influence the relationship between affective organizational commitment and absenteeism [27].

One novel finding was that an increase in the perception of a supportive leadership and adequate staffing resources ratings increased the odds of self-reported low presenteeism. This is very possibly because care workers confident that their perception of a supportive leadership and/or the available staffing resources are adequate to counterbalance absences are more comfortable about staying home while ill. Our findings corroborate those of a previous study on the general Danish workforce [13], indicating that work-related factors, e.g., high levels of time pressure and poor social support, were predictors of presenteeism. In a much more recent study [39] using a univariate model, affective organizational commitment was inversely related to presenteeism, which was confirmed in our simple regression model (not shown). In our multivariate model, affective organizational commitment lost its significance in combination with all other variables. As no previous studies have specifically examined presenteeism in relation to care workers` perception of a supportive leadership and staffing resource adequacy, these findings warrant further investigation.

Finally, our findings suggest that, as psychosocial work environment factors, the perception of a supportive leadership and staffing resource adequacy are important in predicting presenteeism but not absenteeism. Compared to absenteeism, there is no golden rule to describe whether presenteeism is a desired or undesired behaviour in health care. In our opinion, showing up to work while ill could be a sign of commitment as discussed earlier, and fear of loosing one`s job when being absent too often. Nevertheless, one could also see presenteeism as a risk of poor performance due to illness, as a sign of lost productivity [21].

3.7 Strengths and limitations

The SHURP study is the first comprehensive national survey health of care workers in Swiss nursing homes to gather data both on work environment factors and on absenteeism and presenteeism. The findings of this secondary analysis, however, should be interpreted in light of certain limitations. First, the definition of illness and “staffing adequacy” used in this study, relied solely on the respondents’ subjective perceptions of their health, and staffing level, with no independent evaluation of their objective health status and “adequacy” standards in staffing. Second, the cross-sectional design does not allow causal inferences about the observed relationships between variables. Nevertheless, our findings will inform stakeholders and future interventional studies about system factors associated with care workers’ presenteeism at the levels of the organization and the individual care worker. Third, quantifying presenteeism relied solely on self-report measures. Fourth, the secondary data analysis limited our ability to fully evaluate the impacts of all of the proposed model’s domains (Fig.1) on care workers’ health.

3.8 Conclusion

This is the first study in a representative sample of Swiss nursing homes to examine self-reported absenteeism and presenteeism among professional care workers in relation to selected psychosocial work environment factors. Our findings indicate that self-reported presenteeism is more common than absenteeism in Swiss nursing homes, and that the perception of a positive leadership and staffing resource adequacy are significant associations with presenteeism, but not absenteeism. Care workers` presenteeism in nursing homes is an area that has been overlooked. Focusing on presenteeism is reasonable for nurse directors and administrators who want to promote nurses` health in order to sustain the organization. Future analysis is required to assess how presenteeism might influence quality of care. Additional analysis is needed, taking into account the four work environment domains of the proposed WHO workplace model.

3.9 Fund/Conflict of interest

No conflicts of interest declared. This study was funded by the Swiss Health Observatory, Nursing Science Foundation Switzerland, University of Basel's Research fund 2012, Swiss Alzheimer Association, and an anonymous sponsor.

3.10 Acknowledgements

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3.11 References

1. Burton, J., *WHO health workplace framework and model: background and supporting literature and practice*. 2010, WHO Headquarters: Geneva, Switzerland.
2. Bockerman, P. and E. Laukkanen, *Predictors of sickness absence and presenteeism: does the pattern differ by a respondent's health?* J Occup Environ Med, 2010. **52**(3): p. 332-5.
3. Schultz, A.B. and D.W. Edington, *Employee health and presenteeism: a systematic review.* J Occup Rehabil, 2007. **17**(3): p. 547-79.
4. Hemp, P., *Presenteeism: at work--but out of it.* Harv Bus Rev, 2004. **82**(10): p. 49-58, 155.
5. Hansen, C.D. and J.H. Andersen, *Sick at work--a risk factor for long-term sickness absence at a later date?* J Epidemiol Community Health, 2009. **63**(5): p. 397-402.
6. Bockerman, P. and E. Laukkanen, *What makes you work while you are sick? Evidence from a survey of workers.* Eur J Public Health, 2010. **20**(1): p. 43-6.
7. Demerouti, E. and M.P. Le Blanc, *Present but sick: a three-wave study on job demands, presenteeism and burnout.* Career Development International, 2009. **14**(1): p. 50-68.
8. Gustafsson, K. and S. Marklund, *Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study.* Int J Occup Med Environ Health, 2011. **24**(2): p. 153-65.
9. Aronsson, G. and K. Gustafsson, *Sickness presenteeism: prevalence, attendance-pressure factors, and an outline of a model for research.* J Occup Environ Med, 2005. **47**(9): p. 958-66.
10. Aronsson, G., K. Gustafsson, and M. Dallner, *Sick but yet at work. An empirical study of sickness presenteeism.* J Epidemiol Community Health, 2000. **54**(7): p. 502-9.
11. Elstad, J.I. and M. Vabo, *Job stress, sickness absence and sickness presenteeism in Nordic elderly care.* Scand J Public Health, 2008. **36**(5): p. 467-74.
12. Dellve, L., E. Hadzibajramovic, and G. Ahlborg, Jr., *Work attendance among healthcare workers: prevalence, incentives, and long-term consequences for health and performance.* J Adv Nurs, 2011. **67**(9): p. 1918-29.
13. Hansen, C.D. and J.H. Anderson, *Going ill to work : what personal circumstances, attitudes and work-related factors are associated with sickness presenteeism?* Social Science & Medicine, 2008. **67**: p. 956-964.
14. Szymczak, J.E., et al., *Reasons Why Physicians and Advanced Practice Clinicians Work While Sick: A Mixed-Methods Analysis.* JAMA Pediatr, 2015.
15. Dhaini, S., et al. Care workers health in swiss nursing homes and its association with psychosical work environment: a cross-sectional study. IJNS. in press. Doi: http://dx.doi.org/10.1016/j.ijnurstu.2015.08.011.

16. Leineweber, C., et al., *Sickness presenteeism is more than an alternative to sickness absence: results from the population-based SLOSH study.* Int Arch Occup Environ Health, 2012. **85**(8): p. 905-14.
17. Bockerman, P. and P. Ilmakunnas, *Interaction of working conditions, job satisfaction, and sickness absences: evidence from a representative sample of employees.* Soc Sci Med, 2008. **67**(4): p. 520-8.
18. Pilette, P.C., *Presenteeism in nursing: a clear and present danger to productivity.* J Nurs Adm, 2005. **35**(6): p. 300-303.
19. d'Errico, A., et al., *Low back pain and associated presenteeism among hospital nursing staff.* J Occup Health, 2013. **55**(4): p. 276-83.
20. Rantanen, I. and R. Tuominen, *Relative magnitude of presenteeism and absenteeism and work-related factors affecting them among health care professionals.* Int Arch Occup Environ Health, 2011. **84**(2): p. 225-30.
21. Letvak, S.A., C.J. Ruhm, and S.N. Gupta, *Nurses' presenteeism and its effects on self-reported quality of care and costs.* Am J Nurs, 2012. **112**(2): p. 30-38; quiz 48, 39.
22. Kristensen, T., *Sickness absence and work strain among Danish slaughterhouse workers: an analysis of absence from work regarded as coping behaviour.* Social Science & Medicine, 1991. **32**: p. 15–27.
23. Schwendimann, R., et al., *Swiss Nursing Homes Human Resources Project (SHURP) protocol of an observational study.* J Adv Nurs, 2013. **70**(4): p. 915-926.
24. Lake, E.T., *The nursing practice environment: measurement and evidence.* Med Care Res Rev, 2007. **64**(2(suppl)): p. 104S-22S.
25. Akhtar, S., Lee, J.S., *Confirmatory factor analysis and job burnout correlates of the Health Professions Stress Inventory.* Psychological Reports 2002. **90**(1): p. 243-250.
26. Wolfgang, A.P., *The Health Professions Stress Inventory.* Psychological Reports, 1988. **62**(1): p. 220-222.
27. Felfe, J., et al., *Questionnaire for the assessment of affective, calculative and normative commitment to the organization, the profession / activity and employment form (COBB). In Glöckner-Rist, A. (Eds), compilation of social science items and scales. CIS Version 14:00*. 2010, Bonn:GESIS.
28. Sexton, J.B., et al., *The Safety Attitude Questionnaire: psychometric properties, benchmarking data, and emerging research.* BMC Healh Services Reasearch, 2006. **6**(44).
29. OFS, *Swiss Health Survey 2012*. 2012, Federal Department of Home Affairs: Switzerland.
30. Maslach, C.a.J., S.E., *The Measurement of Experienced Burnout.* Journal of Occupational Behaviour, 1981. **2**(2): p. 99-113.

31. West, C.P., et al., *Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals.* j Gen Intern Med, 2009. **24**(12): p. 1318-1321.
32. Roelen, C.A., et al., *Physical and mental fatigue as predictors of sickness absence among Norwegian nurses.* Res Nurs Health, 2013. **36**(5): p. 453-65.
33. Field, A., *Discovering Statistics Using SPSS*. Third Edition ed. 2009, London: SAGE.
34. Enders, K.E., *Applied missing data analysis*. 2010, 72 Spring Street, New York, NY 10012: The Guilford Press.
35. BLS, *Labor force statistics from the current population survey.* 2012, United States Department of Labor: Washington, DC.
36. John, G., *Presenteeism in the workplace: A review and research agenda.* Journal of Organizational Behavior, 2010. **31**: p. 519-542.
37. Clausen, T., et al., *Job demands, job resources and long-term sickness absence in the Danish eldercare services: a prospective analysis of register-based outcomes.* J Adv Nurs, 2012. **68**(1): p. 127-36.
38. Sanders, K. and A. Nauta, *Social cohesiveness and absenteeism: The relationship between characteristics of employees and short-term absenteeism within an organization.* Small Group Research, 2004. **35**(6): p. 724-741.
39. Graf, E., et al., *Affective Organizational Commitment in Swiss Nursing Homes: A Cross-Sectional Study.* The Gerontologist, 2015. **00**(00): p. 1-15.
40. Davey, M.M., et al., *Predictors of nurse absenteeism in hospitals: a systematic review.* J Nurs Manag, 2009. **17**(3): p. 312-30.

CHAPTER 4

CARE WORKERS` HEALTH, PRESENTEEISM, AND IMPLICIT RATIONING OF CARE IN NURSING HOMES: A MULTISITE CROSS-SECTIONAL STUDY

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4.1 Abstract

Aims: To explore associations between care workers' health and implicit rationing of care.

Background: Diverse studies have linked impaired health to reduced work performance–a factor measured through omission of required tasks.

Methods: This cross-sectional study gathered data from 3,239 care workers in 162 Swiss nursing homes. Data were analyzed via a linear logistic regression model using general estimating equations.

Results: Overall, rationing of care occurred "never" to "seldom". Rationing of activities of daily living was positively associated with care workers' joint pain (β 0.04, CI 0.001-0.07), emotional exhaustion (β 0.11, CI 0.07-0.15), and presenteeism (β 0.05, CI 0.004-0.09). Rationing of caring, rehabilitation, and monitoring was positively associated with care workers' joint pain (β 0.05, CI 0.01-0.09) and emotional exhaustion (β 0.2, CI 1.16-0.24).

Conclusions: Nursing home care workers' health is strongly associated with rationing of tasks directly related to resident care.

Implications for Nursing Management: Health organizations should be aware of the association between health-related issues and rationing of care and consider programs to promote care workers' health.

4.2 Background

Healthcare workers are frequently required to perform demanding tasks[1, 2] often under unhealthy working conditions,[3] which can compromise care workers' physical and mental health.[3, 4] Emphasizing the importance of a healthy workplace to organizations' sustainability, Burton (2010) and Neira (2010)[4, 5] defined four key workplace components that influence employee health and safety: the physical work environment; the psychosocial work environment; personal health resources; and enterprise community involvement. This model suggests that employees who work through illness perform below their normal capacity, which may compromise the quality of client service, i.e., patient care[4]. In the context of this study, work performance refers to the employee's cognitive performance,[6] including visuomotor, verbal, and decision-making functions.[7]

Work performance can be assessed through error and omission rates in relation to required tasks,[6] often referred to as rationing of care. Within the scope of this study, in addition to the omission of actions defined in standard operating procedures,[6] task omission was operationally defined as any reduction of standard conduct. This often includes fundamental nursing tasks directly related to patient care and safety. Kalisch et al. (2009) reported that 73% of their study's hospital nurses omitted interventions and basic care,[8] while 53% of psychosocial care related activities were left undone.[9] Depending on the cognitive processes of the involved nurses, these activities may be categorized as missed,[8] left undone,[10] or implicitly rationed;[11] however, all reflect care workers' partial or total omission of necessary tasks.[8][12]

Factors that influence work performance most noticeably have been reflected in the literature. Particularly, impaired health has been linked to performance deterioration in numerous work settings, including healthcare.[13, 14] In this context, the concept of presenteeism has attracted considerable interest in healthcare research, as it is particularly relevant among healthcare workers. Presenteeism is the practice of attending work despite illness, which has been demonstrated to reduce at-work performance.[15][14] Several studies[13, 15, 16] have attributed poor work performance to ill care workers' reduced capacities to meet their jobs' standards of quantity and quality. In the US, studies of the general population have revealed that common pain (e.g., back pain) while at work resulted in reduced work performance and loss of productive time.[17] Similarly, in Switzerland, 25% of the surveyed general population reported decreased work performance due to back pain;[18] and in the Netherlands, Alavinia et al. (2009) showed a significant association between self-reported work-related health problems and decreased performance, i.e., work volume during regular hours, among workers in various occupations.[19] Elsewhere, research on hospital nurses has demonstrated that musculoskeletal pain negatively influenced work performance.[20] In long-term care facilities, musculoskeletal pain among nursing personnel compels workers to modify work tasks or seek extra help from fellow care workers to fulfil their duties.[21] In addition to physical health, mental health (e.g., depression) could also affect care worker performance[20] by sapping

mental and physical energy and hindering concentration.[22] An investigation of their relationships between physical and mental fatigue and nursing work performance among US registered nurses (in hospital, community, and nursing home settings) measured their frequency of divergence from organizational patient safety guidelines, short cuts in patient care, and modification of organizational standards to accelerate task completion. Findings revealed that the higher the reported fatigue level, the lower the perceived work performance.[13]

There is consensus that ill direct care providers cannot fully meet their organizations' work standards.[20] However, to date, no studies have investigated the relationship between care workers' health, presenteeism and rationing of nursing care in nursing homes. To address this gap, the current study's guiding framework is an adaptation of the WHO Healthy Workplace Model[4] (fig.1**),** drawing on the relationship between unhealthy work environments, work-related physical and mental health stressors, and presenteeism vis-à-vis negative influences on employees' work performance, e.g., rationing of care**.** Previous cross-sectional studies of the Swiss Nursing Homes Human Resources Project (SHURP) indicated that work environment factors such as perceived staffing adequacy and leadership were inversely related both to care workers' health problems[3] and to presenteeism.[23] Furthermore, high-perceived staffing adequacy functioned as a predictor of lower rationing of care.[24] Accordingly, utilizing data from the SHURP study and building on previous findings, this study had two aims: 1) to assess the prevalence of implicit rationing of direct resident care, including rationing of activities of daily living and of caring, rehabilitation, and monitoring; and 2) to explore the relationship between care workers' health and presenteeism regarding implicit rationing of care

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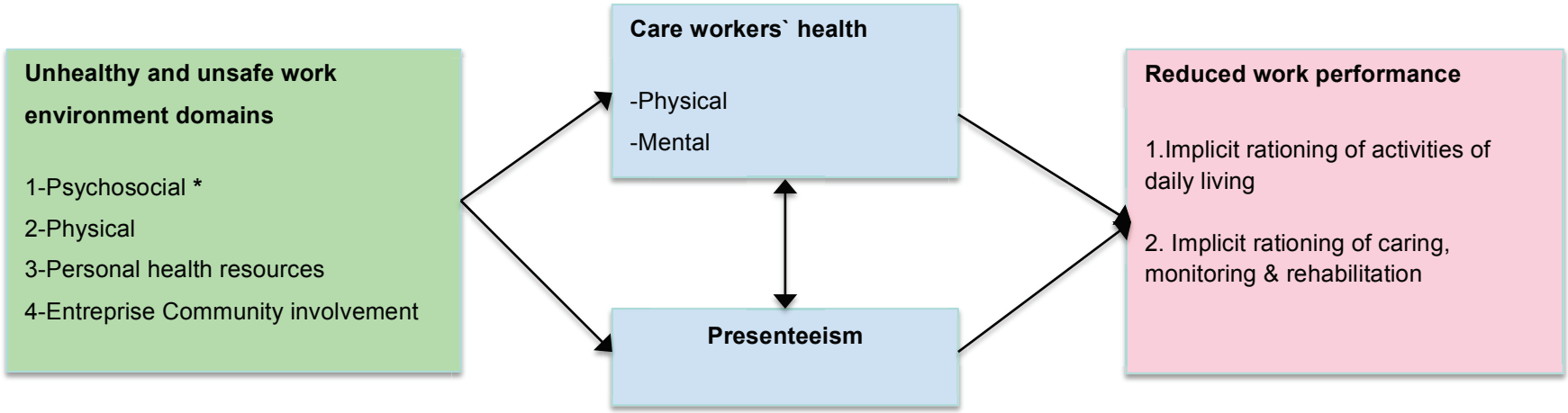
Figure 1. The WHO framework of "Effects of an Unhealthy Workplace on Employees"



***Control variables**

Adapted from Burton (2008) [41]

4.3 Methods

4.3.1 Study design, setting, and sample

This is a secondary analysis of data from the multi-center cross-sectional Swiss Nursing Homes Human Resources Project (SHURP). That SHURP study's sampling and survey methods are described in detail elsewhere.[25]

The SHURP study included a representative sample of 162 nursing homes across Switzerland, stratified according to language region, size, and ownership status. Nursing homes with fewer than 20 beds, residential homes, and geriatric rehabilitation clinics were excluded. Nursing home care workers of all educational levels, facility administrators and nursing managers were invited to complete the survey questionnaire. Care workers who worked less than 8 hours weekly, less than 1 month on the unit, or who were students were excluded. In the parent study, 5,323 care workers returned questionnaires, resulting in an overall response rate of 76.6%. In the current study, we included only staff care workers (i.e.. registered nurses, licensed practical nurses, certified assistant nurses, and nurse aides) directly involved in resident care, and excluded nursing managers and unit supervisors, resulting in a sub-sample of 3,239 care workers.

4.3.2 Data sources, variables and measurements

Socio-demographic and professional data on care workers, including their perceptions of their own health and quality of care, were collected using the SHURP study's Care Worker Personnel Questionnaire. Nursing home facility characteristics were captured from the SHURP Facility Profile questionnaire. The SHURP researchers established the content validity of each scale used by testing the relevance of each variable and scale separately to obtain an item content validity index (I-CVI) and a scale content validity index (S-CVI), respectively. Further information regarding the survey's development and validity pre-testing are described elsewhere [25].

Outcome variables

Implicit rationing of care was measured using the Basel Extent of Rationing of Nursing Care (BERNCA) instrument, adapted to the nursing home setting.[24] For the SHURP study, three questions related to rationing of social care activities were added to the original instrument. Items not relevant to nursing home settings were excluded, leaving the nineteen-item, four-subscale BERNCA–Nursing Home version. Cronbach's alphas for the four subscales ranged between 0.76 and 0.94. For analysis, the mean overall items per subscale was calculated.[24] The current study used two subscales to describe rationing of nursing activities related to direct resident care: "Implicit rationing of activities of daily living", and "Implicit rationing of caring, rehabilitation and monitoring." The survey

question addressed care interventions and therapies that were classed as necessary for specified residents, but were left unperformed or only partly performed because of lack of time or high workload over the past seven shifts workers.[11]

The rationing of activities of daily living subscale included 5 direct resident care activities: sponge bath/skin care; oral or dental hygiene; assistance eating; assistance drinking; mobilization/changing position. The rationing of caring, rehabilitation, and monitoring subscale included 8 direct resident care activities: leaving a resident in urine and/or stool longer than 30 minutes; emotional support; necessary conversations with residents and families; toileting and continence training; activation or rehabilitation activities; monitoring of residents as necessary; monitoring of cognitively impaired residents, including the application of restraints and sedatives; and keeping residents waiting following call bells. All items were measured on a 4-point Likert-type scale (0=never; 1= seldom; 2=sometimes; 3=often), with the further "activity was not necessary" option.[26] For the rationing of activities of daily living and the rationing of caring, rehabilitation, and monitoring subscales, internal consistency showed respective Cronbach's alphas of 0.78 and 0.83 [24].

Explanatory Variables

Three physical health factors were examined, including self-reported back pain, joint pain and headache. The occurrence of self-reported physical health problems during the 4 weeks prior to the survey was measured on a 3-point Likert-type scale (1=not at all, 2=a little bit, 3=strongly) using three items derived from the Swiss Health Survey.[27]

Three self-reported mental health factors were measured: tiredness, sleeplessness, and work-related emotional exhaustion. Tiredness and sleeplessness over the 4 weeks prior to the survey were measured on a 3-point Likert-type scale (1=not at all, 2=a little bit, 3=strongly) via two items derived from the Swiss Health Survey.[27] "Feeling of exhaustion from work" was measured on a 7-point Likert-type scale (ranging from 0=never, to 6=daily) using a single item from the Maslach Burnout Inventory (MBI).[28] The validity of single-item emotional exhaustion measurement is described elsewhere.[29]

For regression analysis, all explanatory variables except emotional exhaustion were dichotomized as 0=never; 1=a little bit or strongly. Emotional exhaustion was dichotomized as 0=never, several times a year or less, once a month or less; and 1=several times a month, once a week, several times a week, or daily.

Presenteeism–expressed as the number of days (if any) in the previous four weeks care workers had attended work in spite of feeling ill and unfit for work–was measured with a single investigator-developed item.[30, 31] Single-item presenteeism questions are used in studies to reduce complexity, ambiguity, cost, and respondent burden.[32] Respondents answered by providing

a number of days. For later analyses, answers were grouped into three categories (0=0 days; 1=1-2 days; 2=3 or more days) [33].

Control Variables

As control variables, we used care workers' ages, genders, professional categories (i.e., registered nurses, licensed practical nurses, certified nursing assistants, and nurse aides), years' professional nursing experience (range: 5 years - >20 years), percentage of time employed, i.e., ≤50%; >50%, (where 42 hours' working time per week corresponds to 100% employment), and usual shifts (days, evenings, nights, or regularly rotating shifts). Professional categories were based on nursing education levels as follows: registered nurses (RNs) (three to four years of education and a diploma in nursing), licensed practical nurses (LPNs) (three years' education), certified nursing assistants (CNA) (two years' education), and nurse aides (short courses and on-the-job training). Facility characteristics included nursing home size (range: small (20-49 beds), medium (50-99 beds), or large (≥100 beds)), language region (German-, French-, or Italian speaking area), and ownership status (private, private subsidized, or public).

Care worker perceptions regarding their work environment, including leadership and staffing adequacy, were also used as control variables, as they have been linked closely to their health,[3] presenteeism,[23] and rationing of care.[24] Two subscales from the Practice Environment Scale of the Nursing Work Index (PES-NWI) questionnaire were used: "Nurse manager ability, leadership, and support of care workers" and "Staffing and resource adequacy."[34] Internal consistency tests of the two subscales showed Cronbach alphas of 0.84 and 0.74, respectively[24]. The "Nurse manager ability, leadership, and support of care workers" (Leadership) subscale measured whether respondents perceived their unit supervisors as supportive and competent leaders, whether mistakes were used as learning opportunities, and whether care workers received rewards and/or recognition for work well done, as well as participation in decision-making. "Staffing and resource adequacy" subscale measured perceptions of whether available staffing levels were sufficient to complete all necessary work, to provide quality care, and to discuss resident problems. All items were rated on 4-point Likert-type scales (range: 1 (strongly disagree) - 4 (strongly agree).

4.3.3 Data collection and analysis

The SHURP survey was administered between May 2012 and April 2013. Detailed information relating to data collection is provided elsewhere.[25]

To address aim 1, we calculated descriptive statistics (frequencies, percentages, means, and standard deviations). For aim 2, we first analyzed each rationing of care outcome's bivariate associations with facility characteristics, care worker characteristics, and work environment factors.

We used generalized estimation equation (GEE) multiple regression models to adjust for the clustering of care workers in nursing home units. Next, for the two self-reported rationing of care outcome measurements, we used general linear regression models to estimate beta coefficients (β) and 95% confidence intervals (CI) for physical and mental health status, and presenteeism. We adjusted for facility and care worker related characteristics, and for work environment factors. Analysis of missing values showed fewer than 5% of responses missing per variable, with 19.3% of respondents (n=775) omitting one or more responses. To explore any pattern of omissions, we analysed the sensitivity of the entire sample (n=4,014) against that of the subgroup who submitted complete response sets (n=3,239). To compare the means of each variable examined between the two samples, we calculated Cohen's d. Calculated differences were small (Cohen's d<0.2)[33] with similar inferences. Data analysis was conducted with IBM/SPSS for Mac Statistics 21.0. We report our analyses' adjusted results.

4.4 Ethical approval

This study was covered by the SHURP project, for which the Canton of Beider Basel ethics committee granted approval (Ref. Nr. EK:02/12). Care workers' voluntary and confidential return of their questionnaires was treated as informed consent.

4.5 Results

4.5.1 Description of sample

Overall, this study included data on 3,239 care workers in 162 nursing homes. Mean scores for self-reported rationing of activities of daily living and of caring, rehabilitation and monitoring were below "seldom" (1.35 and 1.70, respectively). **Table 1** summarizes facilities' characteristics and care workers' psychosocial and work related characteristics.

Roughly one-third of participating facilities were state- owned (37.0%), and slightly fewer than half (46.3%) were medium in size (50-99 beds). Three-quarters (75.9%) were located in Switzerland's German-speaking region. A large majority of care workers were female (92.2%); one third (32.8%) were fifty years of age or older; and 28.1% were registered nurses. The majority (75.1%) were employed more than fifty percent, and 24.4% had twenty years or more of nursing experience. Fewer than half (44.8%) reported working mainly day shifts.

Generally, care workers reported physical health complaints ranging from a little bit to strongly in the previous four weeks. The majority (72.6%) reported back pain; 50.8% reported joint pain; 66.2% reported tiredness; 47.7% reported sleeplessness; and 45.3% reported headache. More than a third of respondents (37.7%) reported frequent emotional exhaustion from work, i.e., from several times a month to daily over the previous four weeks. Of the survey's 3,239 participating care

workers, 26.3% reported presenteeism for at least 2 shifts over the previous month. The mean rating of the work environment quality was high for leadership (3.13), located just above “rather agree”; for staffing adequacy the average rating was slightly below “rather agree” (2.81).

Table 1. Sample characteristics, (N=3,239)

Facility characteristics	**n (%)**	**Mean± SD**
Language speaking region		
German	123 (75.9)	
French	30 (18.5)	
Italian	9 (5.6)	
Ownership status		
State-owned	60 (37.0)	
Private subsidized	43 (26.5)	
Private	59 (36.4)	
Nursing home size		
Small (20-49beds)	63 (38.9)	
Medium (50-99 beds)	75 (46.3)	
Large (≥100 beds)	24 (14.8)	
Care workers` characteristics		
Gender		
Male	253 (7.8)	
Female	2986 (92.2)	
Age groups (years)		
Up to 30	692 (21.4)	
31-40	590 (18.2)	
41-50	893 (27.6)	
>50	1064 (32.8)	
Professional category		
Registered nurse		
Licensed practical nurse	910 (28.1)	
Certified nursing assistant	799 (24.1)	
Nurse aide	618 (19.1)	
	932 (28.8)	
Employment percentage		
Up to 50%	805 (24.9)	
>50%	2434 (75.1)	

Experience in nursing (years)		
Up to 5	667 (20.6)	
6 to 10	7481 (23.1)	
11 to 15	607 (18.7)	
16 to 20	426 (13.2)	
>20	791 (24.4)	
Usual shift		
Days only	1450 (44.8)	
Evenings only	202 (6.2)	
Nights only	397 (12.3)	
Regular change of shifts	1190 (36.7)	
Self-reported [1]physical and [2]mental health status		
Back pain	2350 (72.6)	
Joint pain	1647 (50.8)	
Tiredness	2144 (66.2)	
Sleeplessness	1544 (47.7)	
Headache	1466 (45.3)	
Emotional exhaustion	1220 (37.7)	
[3] *Self-reported presenteeism*	851 (26.3)	
Work environment factors *(scale range 1-4)*		
Leadership		3.13±0.60
Staffing adequacy		2.81±0.66
Implicit rationing of care outcomes *(scale range 0-4)*		
Activities of daily living		1.35±0.54
Caring, rehabilitation, & monitoring		1.70±0.62

[1]Back pain, joint pain, tiredness, sleeplessness, headache: 0= never; 1=a little bit, strongly. [2] Emotional exhaustion: 0=never, several times a year or less, once a month or less; 1=several times a month, once a week, several times a week, daily. [3]Presenteeism: 0=0 & 1 day; 1=2 & more days.
"Group 1" is reported for all variables.

4.5.2 Frequency of rationing of care

Overall, rationing of direct resident care activities was rare. On average, for the seven worked shifts prior to the survey, two-thirds (66.0%) of participants reported never rationing activities of daily living **(Table 2).** Most had never rationed assisting in food intake (74.1%) or drinking (77.0%); strong majorities reported never or rarely rationing bathing (never: 54.6%; seldom: 26.1%) or oral hygiene (never: 55.4%; seldom: 26.5%).

Concerning activities of caring, rehabilitation and monitoring, over one third (42.7%) reported "never" rationing care, rehabilitation, and monitoring activities. The great majority had never or seldom left a resident in urine or stool longer than thirty minutes (never: 68.2%; seldom: 23.4%). Most also reported either never or seldom rationing emotional support (never: 40.8%, seldom: 34.8%), necessary conversations with residents and families (never: 34.2%; seldom: 34.7%), or activating/rehabilitating activities (never: 34.2%; seldom: 34.7%)

Table 2. Descriptions of implicit rationing of nursing care measures

Self-reported implicit rationing of care (N=3,239)	Never (%)	Seldom (%)	Sometimes (%)	Often (%)	Not necessary (%)
Rationing of activities of daily living (ADL)					
Sponge bath/skin care	1768 (54.6)	845 (26.1)	402 (12.4)	67 (2.1)	157 (4.8)
Oral hygiene	1795 (55.4)	858 (26.5)	346 (10.7)	70 (2.2)	170 (5.2)
Assist food intake	2401 (74.1)	427 (13.2)	143 (4.4)	29 (0.9)	239 (7.4)
Assist drinking	2494 (77.0)	423 (13.1)	168 (5.2)	35 (1.1)	119 (3.7)
Mobilization/changing position	2238 (69.1)	684 (21.1)	218 (6.7)	33 (1.0)	66 (2.0)
Rationing of Caring, rehabilitation, & monitoring					
Leave a resident in urine/stool longer than 30mn	2208 (68.2)	758 (23.4)	169 (5.2)	28 (0.9)	76 (2.3)
Emotional support	1320 (40.8)	1127 (34.8)	575 (17.8)	168 (5.2)	49 (1.5)
Necessary conversation with resident/family	1107 (34.2)	1125 (34.7)	586 (18.1)	214 (6.6)	207 (6.4)
Toileting/continence training	1496 (46.2)	1044 (32.2)	390 (12.0)	85 (2.6)	224 (6.9)
Activation or rehabilitation care	1107 (34.2)	1125 (34.7)	586 (18.1)	214 (6.6)	207 (6.4)
Monitoring of residents as care workers felt necessary	1503 (46.4)	935 (28.9)	496 (15.3)	121 (3.7)	184 (5.7)
Monitoring of cognitively impaired residents: use of restraints/sedatives	1507 (46.5)	852 (26.3)	125 (3.9)	125 (3.9)	268 (8.3)
Keeping residents waiting following call bells	808 (24.9)	1297 (40.0)	800 (24.7)	297 (9.2)	37 (1.1)

4.5.3 Factors associated with rationing of care

Most of the studied self-reported health factors were positively related to rationing of care **(Table 3)**. Back pain and sleeplessness did not correlate with rationing of both activities of daily living and those of caring, rehabilitation, and monitoring. Five other physical and mental health factors were positively associated with rationing of activities of daily living: joint pain (β 0.04, CI 0.001-0.07); tiredness (β 0.04; CI 0.002-0.08); headache (β 0.04; CI 0.01-0.08); emotional exhaustion (β 0.11; CI 0.07-0.15), and presenteeism (β 0.05, CI 0.004-0.09).

Similarly, four physical and mental health factors were positively related to rationing of caring, rehabilitation, and monitoring activities: joint pain (β 0.05, CI 0.01-0.09), tiredness (β 0.07, CI 0.03-0.11), headache (β 0.04, CI 0.001-0.08), and emotional exhaustion (β 0.2, CI 1.16-0.24). However, no association was shown between presenteeism and rationing of caring, rehabilitation, and monitoring activities.

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Table 3. **Factors related to rationing of care activities, β coefficient (95% CI)**

[1]Explanatory variables	[2]Implicit rationing of care	
	Activities of daily living β coefficient 95%(CI)	**Caring, rehabilitation & monitoring β coefficient 95%(CI)**
Back pain	0.01 (-0.03-0.04)	0.01 (-0.03-0.05)
Joint pain	0.04 (0.001-0.07)*	0.05 (0.01-0.09)*
Tiredness	0.04 (0.002-0.08)*	0.07 (0.03-0.11)**
Sleeplessness	0.01 (-0.03-0.05)	0.03 (-0.01-0.07)
Headache	0.04 (0.01-0.08)*	0.04 (0.001-0.08)*
Emotional exhaustion	0.11 (0.07-0.15)**	0.2 (1.16-0.24)**
Presenteeism	0.05 (0.004-0.09)*	0.04 (-0.004-0.09)

[1]Back pain, joint pain, tiredness, sleeplessness, headache: 0=never; 1=a little bit & strongly. Emotional exhaustion: 0=never, several times a year or less, once a month or less; 1=several times a month, once a week, several times a week, daily. Presenteeism: 0=0 & 1 day; 1=2 and more days. We reported group "1" in comparison to group "0".
[2]Models were controlled for facility characteristics (language region, ownership status, size), care worker characteristics (gender, age, professional category, employment percentage, & usual shift work), and work environment factors (perceived leadership & staffing adequacy)
*p-value<0.05;**p<0.01

4.6 Discussion

This is the first study to explore nursing care workers' self-reported physical and mental health issues and presenteeism with regard to rationing of activities of daily living and of caring, rehabilitation, and monitoring. Although care workers reported some rationing of basic resident care (e.g., oral care, emotional support, toileting), rationing of care was not common. Results suggested that workers consistently provided the care vital to residents' safety (eating, drinking, basic hygiene, and managing body wastes).[24] After adjustments for care worker characteristics and work environment factors, further analysis positively related compromised physical and mental health status, as well as presenteeism, with rationing of care. While the association between presenteeism and rationing of caring, monitoring, and rehabilitation is not statistically significant, the nearness of the miss (p=0.07; CI= -0-004-0.09) may warrant further examination. The presented findings strongly suggest that health and presenteeism are related to care workers' perceived rationing of care.

In the adjusted models, rationing of care was associated with compromised physical and mental health, along with presenteeism. Care workers' joint pain and headache were related to rationing of activities both of daily living and of caring, rehabilitation, and monitoring. These findings support those of previous studies[19-21] where musculoskeletal pain was a major contributor to decreased work performance. As a general observation, by interfering with normal movement, pain impedes performance of nursing tasks, many of which demand both speed and concentration. Gucer (2009) reported that reduced work performance was manifested by decreased work volume.[21] Because neuron activity is closely intertwined with cognitive performance, changes in oxygen delivery to the cells due to pain perception can impair judgement.[6] Thus, care workers experiencing pain are more likely to omit residents' care needs.

One of our findings was that mental health, including tiredness and emotional exhaustion, was related to rationing of activities both of daily living and of caring, rehabilitation and monitoring. These findings correspond with those of previous studies linking mental illness to decreased working capacity.[36] Greater reductions in work performance occurred when mental illness was coupled with fatigue.[37] When a worker is overwhelmed by a combination of demanding work and physical and emotional fatigue, withdrawal, i.e., reducing effort and performance, has been observed as a coping strategy[38]. Furthermore, care workers who experience emotional exhaustion and tiredness have difficulty focusing their energy and concentration[13] to manage work exigencies. Therefore, as time pressure builds, they tend to prioritize residents' immediate safety, physical comfort and wellbeing (e.g., nutrition and mobilization) above social needs (e.g., communication and support of residents and families).[24]

Another novel finding was the association of increased presenteeism with increased rationing of activities of daily living. One study found that hospital and long term facility nurses who reported compromised health also showed reductions both in working speed and in care quality.[20,

39] Work related illness, pain, or exhaustion might explain common incongruities between workers' knowledge of how to carry out prescribed tasks and their actual fulfilment of those tasks according to organizational guidelines. By compromising task efficacy and impeding output, impaired health among care workers ultimately weakens the quality of the care they provide.[39]

4.7 Strengths and limitations

SHURP is the first study to assess the relationships between care workers' health, presenteeism, and rationing of care in nursing homes. However, related findings should be interpreted in light of certain limitations. First, the cross-sectional design allows no inference of causal relationships between the investigated factors and rationing of care. Second, the current study's explanatory variables were exclusively self-reported. While care workers' perceptions of their own health have been shown reliable[40] they remain a possible source of bias. Finally, as the frequency of care rationing is reported solely from the care workers' perspectives, these data might also be subject to bias.

4.8 Conclusion and Implication for nursing management

This study indicates that nursing home care workers' health is strongly associated with rationing of tasks directly related to resident care, i.e., activities of daily living and caring, and of rehabilitation and monitoring. Therefore, health organizations should be aware of health-related workplace issues and implement programs to promote and maintain care workers' health. Additionally, to reduce rationing of care, administrators should enhance monitoring of emotional distress and related symptoms. Development and testing of related interventions will require further observational studies both of care workers' individual decisions regarding presenteeism and of its impact on work performance, which may ultimately impact quality of care.

4.9 References

1. Feng, C.K., M.L. Chen, and I.F. Mao, Prevalence of and risk factors for different measures of low back pain among female nursing aides in Taiwanese nursing homes. BMC Musculoskelet Disord, 2007. **8**: p. 52.

2. Graham, P. and J.P. Dougherty, *Oh, their aching backs!: occupational injuries in nursing assistants.* Orthopaedic Nursing, 2012. **31**(4): p. 218-223.

3. Dhaini, S., et al., (2016). *Care workers health in Swiss nursing homes and its association with psychosocial work environment: A cross-sectional study*. Int J Nurs Stud, **53**:105-115. doi: 10.1016/j.ijnurstu.2015.08.011.

4. Burton, J., WHO healthy workplace framework and model: background and supporting literature and practice. 2010, WHO Headquarters: Geneva, Switzerland.

5. Neira, M., Healthy workplaces: a model for action. For employers, workers, policy-makers and practitioners. 2010, World Health Organization: Geneva, Switzerland.

6. McNeill, M., Critical Care Performance in a Simulated Military Aircraft Cabin Environment. 2006, University of Maryland, Baltimore, MD.

7. Alhola, P. and P. Polo-Kantola, *Sleep deprivation: Impact on cognitive performance.* Neuropsychiatr Dis Treat, 2007. **3**(5): p. 553-67.

8. Kalisch BJ, L. G, and W. RA., *Missed nursing care: errors of omission.* Nurs Outlook 2009. **57**(1): p. 3-9.

9. Ausserhofer, D., et al., Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study. BMJ Qual Saf, 2014. **23**(2): p. 126-35.

10. Lucero, R., E. Lake, and L. Aiken, *Variations in nursing care quality across hospitals.* J Adv Nurs, 2009. **65**(11): p. 2299-310.

11. Schubert, M., et al., Validation of the Basel Extent of Rationing of Nursing Care instrument. Nurs Res, 2007. **56**(6): p. 416-24.

12. Jones, T.L., P. Hamilton, and N. Murry, Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. Int J Nurs Stud, 2015. **52**(6): p. 1121-37.

13. Barker, L.M. and M.A. Nussbaum, Fatigue, performance and the work environment: a survey of registered nurses. J Adv Nurs, 2011. **67**(6): p. 1370-82.

14. Letvak, S. and C.J. Ruhm, The impact of worker health on long term care: implications for nursing managers. Geriatr Nurs, 2010. **31**(3): p. 165-9.

15. Lerner, D. and R.M. Henke, What does research tell us about depression, job performance, and work productivity? J Occup Environ Med, 2008. **50**(4): p. 401-10.

16. Lerner, D., et al., *The Work Limitations Questionnaire.* Med Care, 2001. **39**(1): p. 72-85.

17. Ricci, J.A., et al., Back pain exacerbations and lost productive time costs in United States workers. Spine (Phila Pa 1976), 2006. **31**(26): p. 3052-60.

18. Mannion, A.F., et al., *The association between beliefs about low back pain and work presenteeism.* J Occup Environ Med, 2009. **51**(11): p. 1256-66.

19. Alavinia, S.M., D. Molenaar, and A. Burdorf, Productivity loss in the workforce: associations with health, work demands, and individual characteristics. Am J Ind Med, 2009. **52**(1): p. 49-56.

20. Letvak, S.A., C.J. Ruhm, and S.N. Gupta, *Nurses' presenteeism and its effects on self-reported quality of care and costs.* Am J Nurs, 2012. **112**(2): p. 30-38; quiz 48, 39.

21. Gucer, P.W., et al., Work productivity impairment from musculoskeletal disorder pain in long-term caregivers. J Occup Environ Med, 2009. **51**(6): p. 672-81.

22. Pilette, P.C., Presenteeism in nursing: a clear and present danger to productivity. J Nurs Adm, 2005. **35**(6): p. 300-303.

23. Dhaini, S., et al., Absenteeism and presenteeism among care Workers in Swiss nursing homes and their association with psychosocial work environment: a multi-site cross-sectional study. The Gerontology, 2015. **in press**.

24. Zuniga, F., et al., The relationship of staffing and work environment with implicit rationing of nursing care in Swiss nursing homes--A cross-sectional study. Int J Nurs Stud, 2015. **52**(9): p. 1463-74.

25. Schwendimann, R., et al., Swiss Nursing Homes Human Resources Project (SHURP) protocol of an observational study. J Adv Nurs, 2013. **70**(4): p. 915-926.

26. Schubert, M., et al., Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals--a cross sectional study. Int J Nurs Stud, 2013. **50**(2): p. 230-9.

27. OFS, *Swiss Health Survey 2012*. 2012, Federal Department of Home Affairs: Switzerland.

28. Maslach, C.a.J., S.E., *The Measurement of Experienced Burnout.* Journal of Occupational Behaviour, 1981. **2**(2): p. 99-113.

29. West, C.P., et al., Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. j Gen Intern Med, 2009. **24**(12): p. 1318-1321.

30. Demerouti, E. and M.P. Le Blanc, *Present but sick: a three-wave study on job demands, presenteeism and burnout.* Career Development International, 2009. **14**(1): p. 50-68.

31. John, G., *Presenteeism in the workplace: A review and research agenda.* Journal of Organizational Behavior, 2010. **31**: p. 519-542.

32. Bowling, A., *Just one question: If one question works, why ask several?* J Epidemiol Community Health, 2005. **59**(5): p. 342-5.

33. Aronsson, G., K. Gustafsson, and M. Dallner, *Sick but yet at work. An empirical study of sickness presenteeism.* J Epidemiol Community Health, 2000. **54**(7): p. 502-9.

34. Lake, E.T., *The nursing practice environment: measurement and evidence.* Med Care Res Rev, 2007. **64**(2(suppl)): p. 104S-22S.

35. Enders, K.E., *Applied missing data analysis*. 2010, 72 Spring Street, New York, NY 10012: The Guilford Press.

36. Dewa, C.S., et al., How does burnout affect physician productivity? A systematic literature review. BMC Health Serv Res, 2014. **14**: p. 325.

37. Kessler, R., et al., Comparative and interactive effects of depression relative to other health problems on work performance in the workforce of a large employer. J Occup Environ Med, 2008. **50**(7): p. 809-16.

38. Janssen, O., K.C. Lam, and X. Huang, Emotional exhaustion and job performance: the moderating roles of distributive justice and positive affect. J. Organiz. Behav, 2010. **31**: p. 789-809. doi 10.1002/job/614.

39. Umann, J., L. De Azevedo Guido, and E. Da SIlva Grazziano, *Presenteeism in hospital nurses.* Rev Latino-Am. Enferm, 2012. **20**(1): p. 159-66.

40. Palmer, K.T., et al., Population-based cohort study of incident and persistent arm pain: role of mental health, self-rated health and health beliefs. Pain, 2008. **136**(1-2): p. 20-37.

41. Burton, J., *The business case for a healthy workplace*. 2008, Industrial Acident Prevention Association: Canada.

CHAPTER 5

FACTORS ASSOCIATED WITH JOB SATISFACTION AMONG CARE WORKERS IN SWISS NURSING HOMES– A CROSS SECTIONAL STUDY

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5.1 Abstract

Background: Nurses' job satisfaction is related to working conditions and work environment, while it remains unclear which factors are most influential regarding high job satisfaction in nursing home settings. The purpose of this study was to describe job satisfaction among care workers in Swiss nursing homes and to examine associated nursing-related organizational factors and health issues.

Methods: A cross-sectional study using a representative national sample of Swiss nursing homes including 4145 care workers from all educational levels (registered nurses, licensed practical nurses, nursing assistants and aides) from 162 nursing homes. Care worker-reported job satisfaction was measured with a single item; explanatory variables were assessed with established scales, e.g., the Practice Environment Scale – Nurse Working Index (adapted for nursing home use). Generalized Estimating Equation (GEE) models were used to examine job satisfaction related factors.

Results: Overall, care workers' job satisfaction was rather high: 36.2% of respondents reported high satisfaction with their workplace. Factors significantly associated with high job satisfaction were supportive leadership (OR= 3.76), improved teamwork and resident safety climate (OR=2.60), resonant nursing home administrator (OR=2.30), adequate staffing resources (OR=1.40), fewer workplace conflicts (OR=.61), less sense of depletion after work (OR=.88), and fewer physical health problems (OR=.91).

Conclusions: The quality of nursing home leadership–at both the unit supervisor and the executive administrator level–was strongly associated with care workers' job satisfaction. Therefore, recruitment strategies addressing specific profiles for nursing home leaders are needed, followed by ongoing leadership training. Future studies should examine the effects of interventions designed to improve nursing home leadership and work environments on outcomes both for care staff and for residents.

5.2 Background

Societal and demographic changes are swelling the numbers of care-dependent older people in long-term care facilities, particularly nursing homes [1, 2]. Decades of hospital-based empirical studies have linked nurses' job satisfaction closely to working conditions and work environment, job stress, role conflict and ambiguity, role perception and content, and organizational and role commitment [3]. In a recent concept analysis, job satisfaction was defined as "*an affective reaction to a job that results from the incumbent's comparison of actual outcomes with those that are desired, expected and deserved"* (p 130) [4]. Accordingly, for nurses, it remains a complex phenomenon, depending on individual feelings, personal expectations and the nature of the job [3].

5.2.1 Literature review

In nursing homes, care workers' job satisfaction varies considerably between and within countries. Still, in the US, data from the National Nursing Home Survey indicated that 82% of nursing assistants were satisfied or extremely satisfied with their jobs [5]; in a similar study in Sweden, 76% of nursing assistants reported moderate or high general job satisfaction [6]. Other international nursing home studies report high overall job satisfaction scores among care staff [7, 8], nursing assistants [9], and registered nurses [10]. Such results suggest that care workers' job satisfaction is associated with various work environment factors rather than individual (e.g., age) or facility characteristics (e.g., bed count) [11]. Higher job satisfaction among nursing home care staff is related to the opportunity to provide high-quality care [12], effective leadership [13] and teamwork, [14] as well as it is significantly related to resident satisfaction [15] and person-centered care [6]. Lower job satisfaction correlates with shortages of qualified personnel [16], inadequate supervision [17], lack of cooperation [18, 17], health complaints and absence due to illness [19, 20, 6], as well as intent to leave and turnover [21-23]. At the organizational level, a lack of opportunities for advancement and professional growth as well as insufficient compensation also appears to contribute strongly to job dissatisfaction [12, 14, 13, 16], while greater job autonomy, job control, and involvement in decision-making [24-28] are all associated with higher satisfaction.

5.2.2 Nursing homes in the Swiss healthcare system

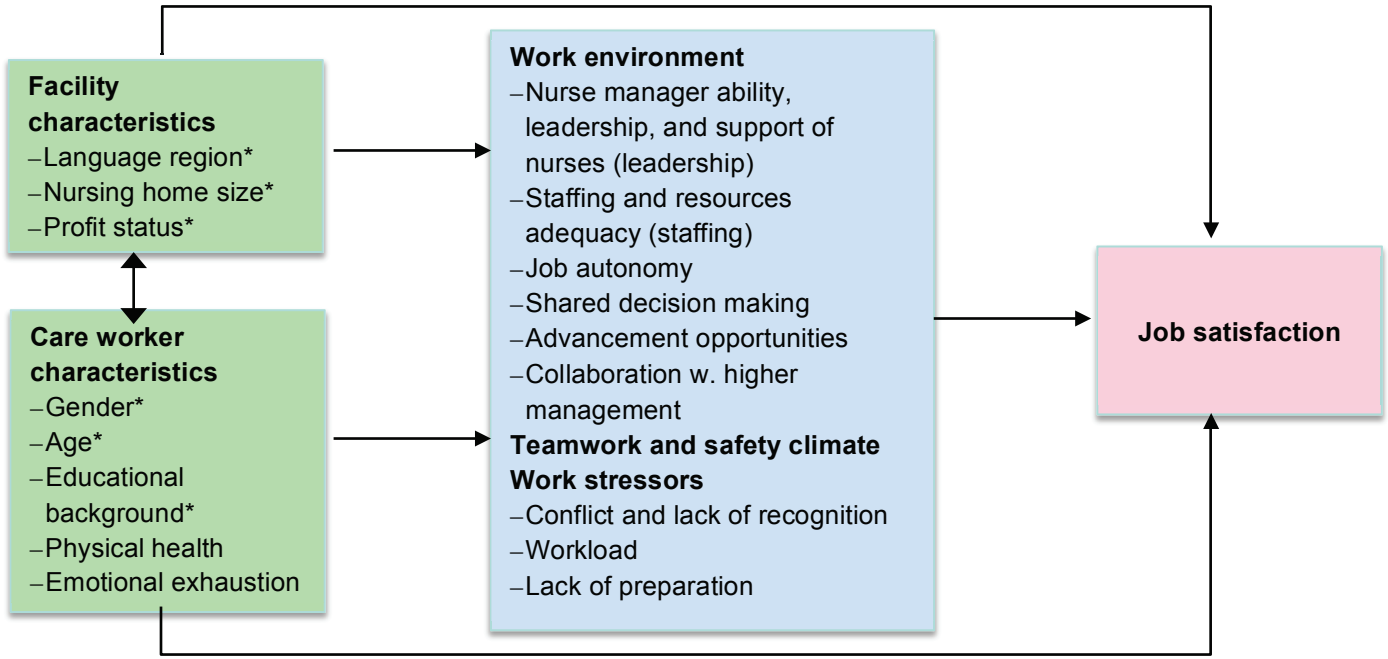
In the ongoing Swiss Nursing Homes Human Resources Project (SHURP), nursing home administrators across Switzerland report difficulty recruiting care workers, especially registered nurses [29]. While the Swiss healthcare system is characterized by a high degree of local autonomy, all cantons (states) and their municipalities are legally obliged to guarantee primary and ambulatory care, along with hospitals and long term facilities such as nursing homes [30]. Nursing homes may have public, private or mixed ownership, and offer services ranging from adult daycare and post-

acute care (including rehabilitation) to dementia care and long-term nursing in home-like environments [29]. In 2012, Switzerland's 1,558 nursing homes (median size: 59 beds) hosted 121'000 people (mean ages in years: 80.8 (males) and 85.2 (females)) [31]. Nursing home care staff includes nurses with a broad array of educational levels: formal training and education range from 18 days to 4 years. All home operators must be licensed. Additionally, 11 of the country's 26 cantons issue care worker skill mix guidelines. On average, these recommend that 20% of care providers be tertiary level educated nurses (3-4 years' education, e.g., registered nurses), and 30% secondary level educated nurses and healthcare workers (2-3 years' education). For remaining auxiliary staff, including nursing aides, no recommendations are given [32].

5.2.3 Literature gap

Although multiple nursing home studies have examined job satisfaction, most focused on no more than two influencing factors, with no comprehensive exploration either of the multiple nursing-related organizational factors or of care workers' health issues–characteristics affecting job satisfaction across care worker categories–in a representative national nursing home sample. Thus, it remains unclear which factors are most influential regarding high job satisfaction in nursing home settings. For the current study, guided by Donabedian's structure-process-outcome model, [33] we considered job satisfaction as an outcome determined by organizational factors, along with care worker and work environment aspects (e.g., leadership, teamwork and safety climate, work stressors) (see figure 1).

Figure 1: Nursing home and care worker characteristics and workplace factors related to job satisfaction



***Control variables**

5.3 Methods

5.3.1 Study Aims

1) to determine job satisfaction among Swiss nursing home healthcare workers, and 2) to examine associated nursing-related organizational factors and care workers' health issues in a representative national sample of Swiss nursing homes.

5.3.2 Design and sample

This study utilizes data from the *Swiss Nursing Homes Human Resources Project* (SHURP), a cross-sectional multi-center study using 163 randomly sampled officially listed nursing homes across Switzerland. Facilities were stratified according to language region (German, French, or Italian) and bed count. Including workers engaged in direct care and employed a minimum of 8 hours per week in the selected nursing homes resulted in a final sample of 5'323 individuals. The SHURP study's sampling and survey methods are described elsewhere in greater detail [34]. The current study included a national representative sample of nursing homes with at least 20 beds, and excluded residential homes and hospices. To address our study objectives, we excluded persons with leadership positions (e.g., unit and department managers), resulting in a study sample of 4,145 care workers from 162 nursing homes.

5.3.3 Variables and measurement

Outcome variable

Care worker job satisfaction was measured using a single item: "How satisfied are you overall with your current job in this nursing home?" Respondents rated their satisfaction on a 4-point Likert-type scale, ranging from 1 (*strongly dissatisfied*) to 4 (*strongly satisfied*). To focus our analysis on the most satisfied respondents, we dichotomized the outcome variable as follows: 1=strongly satisfied; 2=rather satisfied, rather dissatisfied, or strongly dissatisfied. The single item approach reflects job satisfaction as a whole with high reliability and validity [35], and has been used successfully in previous hospital and nursing home studies [36, 15, 5, 37].

Explanatory variables

The independent variables of interest were care workers perceptions of leadership, staffing and resource adequacy, job autonomy, shared decision making, advancement opportunities, quality of collaboration with higher management persons, workplace stressors and care workers' health complaints. The methods used to measure these variables are described in Table 1.

Table 1: Description of independent variables used in the job satisfaction study

Variable Name	Description	Measurement
Work environment		
Leadership	5-item subscale "*Nurse manager ability, leadership, and support of care workers"* of the PES-NWI [48], 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-type scale from 1=strongly disagree to 4=strongly agree Cronbach's α=.84
Staffing and resource adequacy	3-item subscale "*Staffing and resources adequacy*" of the PES-NWI [48], 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 perform all necessary tasks	4-point Likert-type scale from 1=strongly disagree to 4=strongly agree Cronbach's α=.74
Job autonomy	Single item (Investigator developed), assessing whether care workers decide autonomously how to perform their work	4-point Likert-type scale from 1=strongly disagree to 4=strongly agree
Shared decision making	Single item of the PES-NWI [48], assessing opportunities for care workers to participate in nursing home policy decisions (e.g., about resident care or work organization)	Idem
Advancement opportunities	Single item of the PES-NWI [48], assessing opportunities for professional advancement (e.g., continuing education opportunities, special tasks within the team / in the nursing home)	Idem
Safety Attitude Questionnaire (SAQ)		
Teamwork and safety climate	Combination of two subscales of the SAQ [49]. Based on confirmatory factor analysis, the original two subscales for *Teamwork* and *Safety Climate* could not be confirmed.	5-point Likert-type scale from 1=strongly disagree to 5=strongly

	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.	agree with the option "don't know" Cronbach's α=.89
Quality of collaboration with higher management		
Available director of nursing	Single item of the PES-NWI [48], assessing whether the director of nursing is available for the care staff	4-point Likert-type scale from 1=strongly disagree to 4=strongly agree
Resonant nursing home administrator	Single item of the PES-NWI [48], assessing whether the nursing home administrator has an "open ear" and responds to issues raised by the care staff	Idem
Work stressors - Health Professions Stress Inventory (HPSI)		
	Of the original 30-item HPSI, [50] 12 items were selected based on expert ratings concerning their relevance in the nursing home context. Exploratory factor analysis identified 3 factors.	5-point Likert-type scale ranging from 0=never to 4=very often
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 concerning decisions about one's job, and not being paid enough	Idem Cronbach's α=.76
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 perform the work well	Idem Cronbach's α=.74

Lack of preparation	3-item subscale, assessing, e.g., lacking the training to meet residents' needs, being afraid of making a mistake in the residents' treatment and being overwhelmed by caring for terminally ill residents	Idem Cronbach's α=.63
Health complaints		
Physical health	From the original Swiss Health Survey [51], 5 items on health complaints, including back pain, joint pain, tiredness, problems with sleeping, and headache were extracted to assess care workers' self-reported physical health. We combined the 5 items to form a sum index ranging from 0 to 10 to express care workers general health condition.	3-point Likert-type scale from "1=not at all to 3=strongly" Cronbach's α= .70
Depleted from work	Single item according to the Maslach Burnout Inventory [52], assessing care workers' feelings of being depleted at the end of a working day	7-point Likert-type scale from "0=never to 6=daily"

Care worker characteristics and n*ursing home characteristics* were used as control variables. *Care worker characteristics* included age and educational level (registered nurses with diploma or higher degrees, licensed practical nurses with associate degrees, and nursing assistants/nursing aides with certified education or informal in-service training). N*ursing home characteristics* included facility size (small: 20-49 beds; medium: 50-99 beds; large: ≥100 beds), language region (German-, French-, or Italian-speaking area) and ownership status (public, private - public subsidized, and private nursing homes).

5.3.4 Data collection

The SHURP survey was administered from May 2012 until April 2013. All nursing home administrators gave informed consent for their facilities' participation and forwarded the questionnaires and return envelope packages to their care workers. For the care workers, completion and return of the questionnaire was considered informed consent.

5.3.5 Data Analyses

To fulfill aim 1, care worker and nursing home facility characteristics were analyzed using descriptive statistics (frequencies, percentages, means and standard deviations). To fulfill aim 2, we adjusted for skewing of data for job autonomy, shared decision making, advancement opportunities, and collaboration with higher management by dichotomizing the responses (1=strongly agree/agree; 2=disagree or strongly disagree). To examine factors related to care workers' job satisfaction (1= strongly satisfied, 2= rather satisfied, rather dissatisfied, or strongly dissatisfied), we then used generalized estimating equation (GEE) modeling, accounting for the nestedness of care workers within facility and unit levels (ICC1 job satisfaction: facility level: 0.07; unit level: 0.10) and controlling for facility characteristics (size, ownership status, language region) and care worker characteristics (age, educational levels) in a logistic regression. Our analyses tested both unadjusted and adjusted models. Multicollinearity among the independent variables (i.e., workplace characteristics and attributes) was determined with the Variance Inflation Factor (VIF). Accordingly, all variables were retained because analyzed values remained below the threshold of 5 [38]. The GEE was run with listwise deletion of missing cases. The analysis was repeated using a GEE model employing multiple imputation: all variables showed similar significance levels to the first model. A p-level of <.05 was considered significant. All analyses were performed using IBM© SPSS© Statistics for Windows©, Version 21.0 software (Armonk, NY: IBM Corp.).

5.4 Results

5.4.1 Sample characteristics and care workers' job satisfaction

The final study sample consisted of 4,145 care workers from 162 nursing home facilities across Switzerland, with an overall response rate of 76.4%. Respondents came mainly from medium sized facilities in the German-speaking region. Overall, care workers' job satisfaction was rather high, with 36.2% reporting strong workplace satisfaction, while 50.4% were rather satisfied and 13.4% were either rather or strongly dissatisfied. For the work environment characteristics measured, high scores implied positive perceptions. Similarly, we observed high values for teamwork and safety climate (3.97) and for leadership (3.13), whereas values were low for workplace conflict related stressors (.91) and for job preparation (.68). In addition, relatively high proportions of respondents agreed or strongly agreed with shared decision making options (86.1%), and with directors of nursing being available for care staff (89.6%). All results related to facility and care worker characteristics are summarized in Table 2.

Table 2. Sample characteristics

	%	Mean	SD
Facility characteristics (n =162)			
Facility size (number of beds)			
Small (<50)	38.9		
Medium (50-99)	46.3		
Large (≥100)	14.8		
Ownership status			
Public	37.0		
Private, public subsidized	26.5		
Private	36.4		
Language region			
German speaking	75.9		
French speaking	18.5		
Italian speaking	5.6		
Care worker characteristics (n=4,145)			
Females (n=4,105)	92.5		
Age in years (n=3,750)		42.9	12.3
Educational level (n=4,109)			
Registered nurse (3-4 year education)	25.8		
Licensed practical nurse (3 year education)	22.1		
Certified nurse assistant (1-2 year education)	19.2		
Nurse aide (short course, training on the job)	29.6		
Other	3.2		
Work environment			
Leadership (PES-NWI) (1-4), (n=4,145)		3.13	.60
Staffing & resources adequacy (PES-NWI) (1-4), (n=4,138)		2.82	.66
Job autonomy (*), (n=4,117)	80.6		
Shared decision making(*), (n=4,123)	86.1		
Advancement opportunities (*), (n=4,130)	84.4		

Teamwork & safety climate (SAQ) (1-5), (n=4,133)		3.97	.66
Conflict and lack of recognition (HPSI) (0-4), (n=4,138)		.91	.67
Workload (HPSI) (0-4), (n=4,138)		1.53	.82
Lack of preparation (HPSI) (0-4), (n=4,132)		.68	.59
Resonant nursing home administrator (*), (n=4,093)	75.7		
Available director of nursing (*), (n=4,114)	89.6		
Care worker reported health			
Physical health (0-10), (n=4,035)		3.48	2.27
Depleted from work (0-6), (n=4,097)		2.88	1.82

Note: Underlined scores are preferable scores; *dichotomized variables indicate proportion of respondents who agreed strongly/agreed vs. those who disagreed strongly/disagreed with item, or who rated quality of care as rather high / very high vs. rather low / very low.

5.4.2 Job satisfaction and workplace characteristics

Higher job satisfaction (i.e., strong satisfaction with the workplace) was significantly associated with half of the examined work environment factors. The strongest association was with leadership: the odds of high job satisfaction increased almost four-fold with each 1-point increase in leadership rating (OR= 3.76; 95% CI, 2.83-4.99), in either more than two-fold with a 1-point increase either in teamwork & resident safety climate (OR= 2.59; 95% CI, 2.02-3.32), or for nursing home administrators being resonant (as opposed to not listening to care workers) (OR=2.23; 95% CI, 1.67-2.97). The odds of strong job satisfaction also increased significantly with staffing and resource adequacy (OR=1.42; 95% CI, 1.17-1.72), and decreased significantly with increases in workplace conflict (OR= .61; 95% CI, .48-.76), being “depleted from work” (emotional exhaustion) (OR=.88; 95% CI, .83-.93), and physical health issues (OR=.91; 95% CI, .87-.96). For more details see table 3.

Table 3: Job satisfaction and nursing home work environment characteristics*

	Job satisfaction[1] (n=3,750)		
	OR	**95% CI**	**p-value**
Leadership (PES-NWI)	3.761	2.833 – 4.993	<0.001
Staffing & resource adequacy (PES-NWI)	1.418	1.166 – 1.724	<0.001
Job autonomy	.788	.619 – 1.004	0.054
Shared decision making	1.351	.884 – 2.065	0.164
Advancement opportunities	1.130	.772 – 1.654	0.530
Teamwork & safety climate	2.592	2.021 – 3.323	<0.001
Available director of nursing	1.474	.908 – 2.393	0.117
Resonant nursing home administrator	2.231	1.676 – 2.970	<0.001
Conflict and lack of recognition (HPSI)	.605	.483 – .759	<0.001
Workload (HPSI)	.863	.737 – 1.011	0.068
Job preparation (HPSI)	.995	.829 – 1.193	0.953
Physical health	.910	.866 – .955	<0.001
Depleted from work	.877	.825– .933	<0.001

Note: Binary logistic regression with GEE. The model was controlled for care worker characteristics (age, educational level) and facility characteristics (language region, ownership status, and size), OR=Odds ratio, CI=Confidence interval[1] Two groups: 1=strongly satisfied vs. 2=rather satisfied, dissatisfied, or strongly dissatisfied. Group 1 is reported.

5.5 Discussion

To date, this was the most comprehensive study of associations between nursing-related organizational factors, health-related issues and job satisfaction. Conducted in a representative national sample of Swiss nursing homes, it revealed that slightly over a third of care workers were strongly satisfied with their current workplace. Strong job satisfaction was significantly associated with higher ratings for supportive leadership, teamwork and safety climate, resonant nursing home administrators, and adequate staffing resources, and with lower ratings for workplace conflict and health complaints. Other work environment factors, e.g., workload, job autonomy, or director of nursing being available to the care workers, showed no significant associations with job satisfaction.

The rather high overall job satisfaction ratings of care workers in Swiss nursing homes concur not only with previous studies' findings in nursing home [21] and acute-care settings [36], but with those derived from research in other sectors [39, 40]. However, while all previous studies dichotomized their data to distinguish positive job satisfaction ratings from negative [15, 21, 5], we focused exclusively on highly satisfied care workers. By examining this group's data, we aimed to identify factors separating average or good nursing home workplaces from those that are excellent.

In our adjusted regression model, three factors most significantly explained variations in the proportions of care workers reporting strong job satisfaction–nursing home leadership, teamwork and safety climate and the resonance of the nursing home administrator. In this context, links between perceptions of supportive leadership–particularly of individual leaders' types and levels of interaction with their staff– strongly suggest that workers strongly satisfied with their jobs believe that their leaders both support them and recognize their input. I.e., supervisors' support and appreciation are highly appreciated by highly-satisfied care workers and may contribute to their strong job satisfaction. These findings agree with those of previous nursing home studies, which have indicated that supportive managers contribute to nurses` job satisfaction [10, 37]. In addition, as observed elsewhere, leadership styles that treat care errors as learning opportunities rather than as opportunities for criticism are more likely to develop trust and commitment among care workers [41, 42]. The high resonance ratings very satisfied workers afford their nursing home administrators imply that top nursing home leaders foster and maintain direct lines of communication with front line care workers, monitoring their needs and ensuring the achievement of organizational goals in their daily operations [43, 44].

As interconnected work environment aspects, enhanced teamwork and safety climate are both associated with strong job satisfaction, which stabilizes nursing systems at the facility organizational level. This effect implies that the more stability and equilibrium care workers experience, the more satisfaction they derive from their current positions [45]. For instance, alongside input from team members about care activities, constructive performance feedback is highly valued. Furthermore, both teamwork and safety climate involve support from colleagues in resident care, strengthening

care workers' impressions both that they belong to well-coordinated teams with cultures of mutual learning and that they would feel safe as patients on their units. As observed in the current study, confidence in and stimulation from co-workers [12] are related to positive perceptions of teamwork, fostering high job satisfaction.

Staffing adequacy ratings reflected workers' personal senses of whether their units' staff counts and skill mixes were sufficient to perform all necessary work while maintaining high care quality. Linked significantly with job satisfaction, this included their opinion of whether they had the time and the opportunity to discuss resident care problems with one another. However, Van Beek and colleagues [8] noted that, while their analyses initially indicated significant relationships between nurse manager reported staffing levels and staff job satisfaction, controlling for communication density removed the apparent significance of that relationship, i.e., higher staffing alone does not increase job satisfaction. Instead, where workplace satisfaction is concerned, the current study's findings suggest that the effect of allocating a prescribed number of workers to a unit is secondary to those workers' perceptions of staffing adequacy (including skill mix) and of their opportunities to communicate with one another.

The topic of workplace conflict and lack of recognition encompasses a range of stressors with the potential to impact care workers' job satisfaction. These include disagreements between care workers and other health professionals concerning residents' care, not being asked for input on decisions related to one's job (e.g., assignment of residents, task scheduling), clashes with supervisors, not being permitted to use all one's skills or being underpaid. Our analyses linked conflict and lack of recognition significantly with job satisfaction. The subscale used included the item "not being paid enough," a factor examined in studies associating nursing assistants' job satisfaction strongly with wages and benefits [15, 21]. Additional stressful situations, e.g., work interruptions or input from non-health professionals on how to do one's work [46] are not explicitly identified in the current study. Still, workplace conflict has been shown to impair workers' productivity, identification with their team, and job satisfaction [47].

Health issues, e.g., emotional strain (reflected in feelings of emotional exhaustion or depletion at the end of a working day) and physical symptoms of stress (such as back pain, headache, tiredness or problems with sleeping) were also inversely associated with strong job satisfaction. Our findings corroborated those of earlier studies linking low job satisfaction with emotional exhaustion [20] and physical health complaints [6]. One possible explanation is that physical discomfort and emotional exhaustion deplete one's energy, impairing performance, inducing low mood and unpleasant feelings, and ultimately reducing job satisfaction.

5.6 Strengths and limitations

The greatest strength of this job satisfaction study among care workers in Swiss nursing homes was its extensive dataset–the product of a large representative nursing home sample and high response rates. Additionally, the strict focus on strong job satisfaction responses allowed identification of the associations most relevant to the nursing home care workforce. However, the findings should be interpreted with caution in view of its limitations. First, as its cross-sectional design captures care workers' job satisfaction and associated factors only at a single instant, no causal relationships can be inferred. Second, considering the complexity of a socially determined construct such as job satisfaction, the use of a single item to measure it might be disputable. Nevertheless, previous studies have successfully applied similar measures to job satisfaction, as well as to related workplace factors and perceptions [15, 5, 37]. Third, the selection of items examined in relation to job satisfaction was limited to those used in the SHURP study. Other potentially relevant factors, such as worker retention or resident outcomes, were left unexamined. Finally, social desirability bias might have skewed the results towards the positive end, reflecting the workers' desire to be a member of a good workplace.

5.7 Conclusions

This study revealed significant associations between strong job satisfaction in Swiss nursing home care workers and 6 work environment factors: nursing home leadership, teamwork and safety climate, the resonance of the nursing home administrator, workers' perceptions of staffing adequacy, workplace conflict, and health complaints. Of these, the quality of nursing home leadership–at the levels both of unit supervisor and of executive administrator–figured most prominently in care workers' job satisfaction. While this result is supported by various studies of leadership persons' critical characteristics and behaviors, finding and recruiting the right persons and role models for leadership positions is a complex task. Clearly, recruitment strategies addressing specific leadership profiles and skills are necessary, as well as ongoing executive supervision, mentoring and support, including specific leadership training, particularly for middle management positions. In this cross-sectional study, a variety of care worker characteristics and organizational factors were examined, increasing the current understanding of care workers' job satisfaction. To develop and test the complex interventions necessary to measure the effects of enhanced nursing home leadership capacities on residents' health and quality of care, as well as on care staff outcomes, future prospective studies are recommended.

5.8 Ethics approval

All Swiss cantonal ethics committees approved the SHURP study (leading ethics committee: Beider Basel, Ref.Nr. EK 02/12).

5.9 Competing interests

The authors declare that they have no competing interests

5.10 Funding

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5.11 Authors' contributions

RS drafted the manuscript. RS, FZ and DA were involved in the conception and methodological construct of the study including data analysis and interpretation of data. SE and SD critically reviewed the manuscript. All authors read and approved the final version of the manuscript.

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5.13 References

1. Damiani G, Farelli V, Anselmi A, et al. Patterns of long term care in 29 European countries: Evidence from an exploratory study. BMC Health Serv Res 2011: 316. doi: 10.1186/1472-6963-11-316
2. Fujisawa R and Colombo F. The long-term care workforce: Overview and strategies to adapt supply to a growing demand, OECD Health Working Papers, No. 44. OECD Publishing, 2009.
3. Lu H, Barriball KL, Zhang X, et al. Job satisfaction among hospital nurses revisited: A systematic review. Int J Nurs Stud 2012; 8: 1017-38. doi: 10.1016/j.ijnurstu.2011.11.009
4. Castaneda GA and Scanlan JM. Job satisfaction in nursing: A concept analysis. Nurs Forum 2014; 2: 130-8. doi: 10.1111/nuf.12056
5. Han K, Trinkoff AM, Storr CL, et al. Associations between state regulations, training length, perceived quality and job satisfaction among certified nursing assistants: Cross-sectional secondary data analysis. Int J Nurs Stud 2014; 8: 1135-41. doi: 10.1016/j.ijnurstu.2013.12.008
6. Wallin AO, Jakobsson U, and Edberg AK. Job satisfaction and associated variables among nurse assistants working in residential care. Int Psychogeriatr 2012; 12: 1904-18. doi: 10.1017/s1041610212001159
7. Chou SC, Boldy DP, and Lee AH. Staff satisfaction and its components in residential aged care. Int J Qual Health Care 2002; 3: 207-17. doi: 10.1093/oxfordjournals.intqhc.a002612
8. van Beek AP, Wagner C, Spreeuwenberg PP, et al. Communication, advice exchange and job satisfaction of nursing staff: A social network analyses of 35 long-term care units. BMC Health Serv Res 2011: 140. doi: 10.1186/1472-6963-11-140
9. Kuo HT, Yin TJ, and Li IC. Relationship between organizational empowerment and job satisfaction perceived by nursing assistants at long-term care facilities. J Clin Nurs 2008; 22: 3059-66. doi: 10.1111/j.1365-2702.2007.02072.x
10. Choi J, Flynn L, and Aiken LH. Nursing practice environment and registered nurses' job satisfaction in nursing homes. Gerontologist 2012; 4: 484-92. doi: 10.1093/geront/gnr101
11. Probst JC, Baek JD, and Laditka SB. The relationship between workplace environment and job satisfaction among nursing assistants: Findings from a national survey. J Am Med Dir Assoc 2010; 4: 246-52. doi: 10.1016/j.jamda.2009.08.008
12. Castle NG, Degenholtz H, and Rosen J. Determinants of staff job satisfaction of caregivers in two nursing homes in Pennsylvania. BMC Health Serv Res 2006: 60. doi: 10.1186/1472-6963-6-60
13. Parsons SK, Simmons WP, Penn K, et al. Determinants of satisfaction and turnover among nursing assistants. The results of a statewide survey. J Gerontol Nurs 2003; 3: 51-8.

14. Hasson H and Arnetz JE. Nursing staff competence, work strain, stress and satisfaction in elderly care: a comparison of home-based care and nursing homes. J Clin Nurs 2008; 4: 468-81. doi: 10.1111/j.1365-2702.2006.01803.x
15. Bishop CE, Squillace MR, Meagher J, et al. Nursing home work practices and nursing assistants' job satisfaction. Gerontologist 2009; 5: 611-22. doi: 10.1093/geront/gnp040
16. Prey H, Schmid M, Storni M, et al. Zur Situation des Personals in der schweizerischen Langzeitpflege. Zürich: Rüegger, 2004.
17. Parmelee PA, Laszlo MC, and Taylor JA. Perceived barriers to effective job performance among nursing assistants in long-term care. J Am Med Dir Assoc 2009; 8: 559-67. doi: 10.1016/j.jamda.2009.05.001
18. Moyle W, Skinner J, Rowe G, et al. Views of job satisfaction and dissatisfaction in Australian long-term care. J Clin Nurs 2003; 2: 168-76. doi: 10.1046/j.1365-2702.2003.00732.x
19. Roelen CA, Mageroy N, van Rhenen W, et al. Low job satisfaction does not identify nurses at risk of future sickness absence: Results from a Norwegian cohort study. Int J Nurs Stud 2013; 3: 366-73. doi: 10.1016/j.ijnurstu.2012.09.012
20. Tourangeau A, Cranley L, Spence Laschinger HK, et al. Relationships among leadership practices, work environments, staff communication and outcomes in long-term care. J Nurs Manag 2010; 8: 1060-72. doi: 10.1111/j.1365-2834.2010.01125.x
21. Decker FH, Harris-Kojetin LD, and Bercovitz A. Intrinsic job satisfaction, overall satisfaction, and intention to leave the job among nursing assistants in nursing homes. Gerontologist 2009; 5: 596-610. doi: 10.1093/geront/gnp051
22. Kash BA, Castle NG, Naufal GS, et al. Effect of staff turnover on staffing: A closer look at registered nurses, licensed vocational nurses, and certified nursing assistants. Gerontologist 2006; 5: 609-19. doi: 10.1093/geront/46.5.609
23. Tourangeau AE, McGillis Hall L, Doran DM, et al. Measurement of nurse job satisfaction using the McCloskey/Mueller Satisfaction Scale. Nurs Res 2006; 2: 128-36. doi: 10.1097/00006199-200603000-00008
24. de Jonge J, Mulder MJ, and Nijhuis FJ. The incorporation of different demand concepts in the job demand-control model: Effects on health care professionals. Soc Sci Med 1999; 9: 1149-60. doi: 10.1016/s0277-9536(98)00429-8
25. McGilton KS, Hall LM, Wodchis WP, et al. Supervisory support, job stress, and job satisfaction among long-term care nursing staff. J Nurs Adm 2007; 7-8: 366-72. doi: 10.1097/01.nna.0000285115.60689.4b
26. Rodwell J, Noblet A, Demir D, et al. The impact of the work conditions of allied health professionals on satisfaction, commitment and psychological distress. Health Care Manage Rev 2009; 3: 273-83. doi: 10.1097/HMR.0b013e31819e76da

27. te Boekhorst S, Willemse B, Depla MF, et al. Working in group living homes for older people with dementia: The effects on job satisfaction and burnout and the role of job characteristics. Int Psychogeriatr 2008; 5: 927-40. doi: 10.1017/s1041610208007291
28. Tyler DA, Parker VA, Engle RL, et al. An exploration of job design in long-term care facilities and its effect on nursing employee satisfaction. Health Care Manage Rev 2006; 2: 137-44. doi: 10.1097/00004010-200604000-00007
29. Zúñiga F, Ausserhofer D, Serdaly C, et al. Schlussbericht zur Befragung des Pflege- und Betreuungspersonals in Alters- und Pflegeinstitutionen der Schweiz, 2013, University of Basel: Basel.
30. OECD. OECD Reviews of Health Systems: Switzerland 2011. Swiss Federal Office of Public Health, 2011.
31. Bundesamt für Statistik. Statistik der sozialmedizinischen Institutionen 2012 – Standardtabellen. Neuchâtel: Bundesamt für Statistik, 2014.
32. Tschannen A and Zúñiga F. Betriebsbewilligungen für stationäre Langzeitpflegeeinrichtungen: Übersicht der kantonalen Anforderungen 2014, Unveröffentlichte Internetrecherche.
33. Donabedian A. The quality of care. How can it be assessed? JAMA 1988; 12: 1743-8. doi: 10.1001/jama.1988.03410120089033
34. Schwendimann R, Zúñiga F, Ausserhofer D, et al. Swiss Nursing Homes Human Resources Project (SHURP): Protocol of an observational study. J Adv Nurs 2014; 4: 915-26. doi: 10.1111/jan.12253
35. Dolbier CL, Webster JA, McCalister KT, et al. Reliability and validity of a single-item measure of job satisfaction. Am J Health Promot 2005; 3: 194-8. doi: 10.4278/0890-1171-19.3.194
36. Aiken LH, Sermeus W, Van den Heede K, et al. 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 2012: e1717. doi: 10.1136/bmj.e1717
37. Havig AK, Skogstad A, Veenstra M, et al. The effects of leadership and ward factors on job satisfaction in nursing homes: A multilevel approach. J Clin Nurs 2011; 23-24: 3532-42. doi: 10.1111/j.1365-2702.2011.03697.x
38. Field A. Discovering Statistics Using SPSS. London: SAGE, 2009.
39. Eurofound. Fifth European Working Conditions Survey. Luxembourg: Publications Office of the European Union, 2012.
40. Grebner S, Berlowitz I, Alvarado V, et al. Stress bei Schweizer Erwerbstätigen. Stressstudie 2010. Bern: Staatssekretariat für Wirtschaft SECO, 2010.

41. Auer C, Schwendimann R, Koch R, et al. How hospital leaders contribute to patient safety through the development of trust. J Nurs Adm 2014; 10 Suppl: S38-44. doi: 10.1097/nna.0000000000000123
42. Harvath TA, Swafford K, Smith K, et al. Enhancing nursing leadership in long-term care. A review of the literature. Res Gerontol Nurs 2008; 3: 187-96. doi: 10.3928/00220124-20091301-06
43. Forbes-Thompson S, Leiker T, and Bleich MR. High-performing and low-performing nursing homes: A view from complexity science. Health Care Manage Rev 2007; 4: 341-51. doi: 10.1097/01.HMR.0000296789.39128.f6
44. Voon ML, Lo MC, Ngui KS, et al. The influence of leadership styles on employees' job satisfaction in public sector organizations in Malaysia. International Journal of Business, Management and Social Sciences 2011; 1: 24-32.
45. Abualrub RF, Gharaibeh HF, and Bashayreh AE. The relationships between safety climate, teamwork, and intent to stay at work among Jordanian hospital nurses. Nurs Forum 2012; 1: 65-75. doi: 10.1111/j.1744-6198.2011.00253.x
46. Lapane KL and Hughes CM. Considering the employee point of view: Perceptions of job satisfaction and stress among nursing staff in nursing homes. J Am Med Dir Assoc 2007; 1: 8-13. doi: 10.1016/j.jamda.2006.05.010
47. De Dreu CK and Beersma B. Conflict in organizations: Beyond effectiveness and performance. European Journal of Work and Organizational Psychology 2005; 2: 105-117. doi: 10.1080/13594320444000227
48. Lake ET. Development of the practice environment scale of the Nursing Work Index. Res Nurs Health 2002; 3: 176-88. doi: 10.1002/nur.10032
49. Sexton JB, Helmreich RL, Neilands TB, et al. The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. BMC Health Serv Res 2006: 44. doi: 10.1186/1472-6963-6-44
50. Wolfgang AP. The health professions stress inventory. Psychological Reports 1988; 1: 220-222. doi: 0.2466/pr0.1988.62.1.220
51. Eidgenössisches Departement des Inneren and Bundesamt für Statistik. Schweizerische Gesundheitsbefragung 2012 - Telefonischer und schriftlicher Fragebogen, 2014.
52. Maslach C and Jackson S. The measurement of experienced burnout. Journal of Occupational Behaviour 1981; 2: 99-113.

CHAPTER 6

SYNTHSIS AND DISCUSSION

In this final chapter the results of the four studies of this dissertation (**Chapter 2** to **5**) are synthesized and key findings are discussed. Furthermore, methodological strengths and limitations of the dissertation are presented. The last sections of this chapter suggest implications for research and practice.

6.1 Synthesis of key findings

Using the SHURP care worker survey data, we conducted a series of four observational studies focussing on care worker health, absenteeism, presenteeism, rationing of care, and job satisfaction with regard to nursing home work environments.

First, we explored the prevalence of physical and mental health complaints as reported by care workers, and the relationship of the care workers` perceived health in relation to work environment aspects. This study revealed a need to improve care workers` safety and wellbeing in Swiss nursing homes. More precisely, musculoskeletal pain and emotional exhaustion should be addressed by modelling certain aspects of the work environment (e.g. leadership and staffing adequacy).

Second, we explored the association between certain work environment aspects (e.g. perceived leadership and staffing adequacy) and selected care workers` outcomes (absenteeism and presenteeism), adjusting for major care workers-related organizational variables. The study results confirmed previous findings on presenteeism but not on absenteeism: in our regression models, none of our selected work environment explanatory variables was a significant predictor of care worker-reported absenteeism. However, perceived supportive leadership and staffing adequacy were significant predictors of presenteeism.

Third, we looked at the relationship between care workers` perceived health and presenteeism with rationing of care, controlling for previous critical findings on work environment aspects (leadership and staffing adequacy). Although rationing of care was not reported as a common occurrence, we observed that it was significantly influenced by perceived physical and mental health and presenteeism in all regression models.

Fourth, we explored the association of care worker-reported job satisfaction with perceived work environment aspects and health. Controlling for care worker and organizational variables, results revealed that health and work environment aspects (e.g. leadership and staffing adequacy) as perceived by care workers were significant predictors of one`s job satisfaction. This study highlighted the crucial role of leadership, staffing adequacy, and health in relation to care workers` satisfaction.

Overall, this dissertation adds to the body of knowledge on nursing home care workers` health the importance of perceived supportive staffing adequacy and leadership in protecting staff from injuries and emotional stress respectively, and ensuring necessary provision of care according to nursing standards (e.g. reducing rationing of care). The mechanisms of the relationships found

between work environment and health, and between health and rationing of care are discussed in the next section.

6.2 Discussion of key findings

Although not very large, the existing literature examining the effects of organizational factors and working conditions on nursing home care workers` injuries and emotional health is established. However, this discussion focuses on specific and critical components of the psychosocial work environment, e.g. leadership and staffing adequacy, to better evaluate their relative impact on particular health issues, such as musculoskeletal pain (back pain and joint pain) and emotional exhaustion. Furthermore, it will discuss a novel finding of the relationships between perceived health and rationing of necessary resident care, which may have an implication on quality of care.

6.2.1 Perceived staffing adequacy and musculoskeletal pain

A growing number of studies and meta-analytic reviews showed that inadequate staffing can reduce the quality of patient care [1] and jeopardize patient safety [2]. Despite the mounting evidence relating inadequate staffing to negative patients` outcomes, little is known about the associations between inadequate staffing and care workers` health outcomes in nursing homes. Since inadequate staffing intensifies the physical burden and pace of the care workers` job exigencies, it is only plausible that it might place nursing home staff at risk for occupational injuries [3] (**Chapter 2** and **Chapter 3**). Despite the fact that nursing homes are a high-risk workplace not only for residents, but also for care workers, it is not clear whether inadequate staffing explains the significant reported prevalence rates of musculoskeletal pain and injuries.

Our findings on the relationship between perceived staffing adequacy and reduced musculoskeletal pain (back pain and joint pain) conformed to previous nursing home findings [4-6], where an association between inadequate staffing level and injuries was observed. It is commonly perceived that nurses who describe understaffing resources, report a high level of mechanical constraints in movements, postures, and patient handling activities [7]. Having too many patients and/or not having enough staff to help in the provision of care were reported as one of the hardest parts of care workers` job [8]. Studies showed that there is a robust association between inadequate staffing and reported back pain among hospital nurses when adjusting for the amount of time used to help patients in sitting, standing, walking, lifting and carrying, and pushing and pulling [4]. This suggests that the complexity of the required tasks in the provision of nursing care plays a role in the relationship between perceived adequate staffing and the reported rates of musculoskeletal pain and injuries as it might contribute to work conditions that are conducive to injury [9].

Evidence on the use of mechanical devises to perform lifting and positioning, and their link to

reduced musculoskeletal injury rates is controversial [10]. Their effectiveness depends on the willingness of the care worker to invest the time and energy required to use these devices. For this reason, care workers may decide that the encumbrances associated with using a lifting device outweigh the benefit in terms of minimizing the risk of injury [9]. This indicates that care workers rely on each other`s support in performing backbreaking activities. It is sensible that in the case of perceived inadequate staffing, the instances that care workers move and position their patients without peer assistance, might carry them to perform strenuous and unsafe postures repeatedly [5]. The lack of the human factor support explains the frustration of care workers and their link of musculoskeletal problems to inadequate staffing. Typical argument is further supported by observations from the Magnet-certified hospitals, which are known for their sustainable nursing work environments in demonstrating that nurses perceive their work environment positively, and report low rates of occupational health injuries [11].

Of importance, care workers` perception of inadequate staffing is not ideal in reflecting the actual staffing levels compared to other assessment tools, such as nurse-to-patient ratio from administrative data [2]. It may be that the absolute number of the care worker, rather than the qualifications, [9] influences strenuous physical demands, which have been consistently linked to musculoskeletal problems. As such, measures that capture information about staffing levels, in addition to those that reflect the adequacy of staffing, may be important in clarifying the issue of musculoskeletal pain and injuries among care workers. Future studies are necessary to explain the accuracy and validity of both measuring tools, i.e. the perception staffing adequacy and the actual nurse-to-patient ratio, in relation to occupational health outcomes.

6.2.2 Perceived leadership and emotional exhaustion

Emotional exhaustion occurs in individuals when their situation is complex and highly demanding with regard to competence or structural means to deal with the demands [12]. In healthcare, helping patients with major health problems, although it might be personally rewarding, is perceived as stressful when patients are not sensible to the efforts made by care workers to assist them, which was linked to emotional exhaustion [13]. In addition to the responsiveness to patient emotion, evidence on the relationship between organizational factors and emotional exhaustion among care workers is well established. Organizational factors include stress-generating work situations such as increased job demands [14, 15], role conflict [16], low job control [17], and high workload [15], appear to be major determinants of emotional exhaustion. Furthermore, studies showed that care workers who experience an inconsistency between efforts spent at work and expected rewards often report emotional exhaustion [13].

In the prevention of emotional exhaustion, underpinning theories have emphasized the role of leadership practices [18]. According to Blacke-Mouton theory, it is the leader`s responsibilities to

focus not only on the work outcome, but also on the human relations within the team [19]. The dissertation findings (**Chapter 2**) confirm the link between perceived leadership and self-reported emotional exhaustion, where perceived supportive leadership and reduction of self-reported emotional exhaustion were observed [17, 20-22]. Tyrannical leadership practices and too much control-oriented [23], not enabling other to act [17] significantly predicted emotional exhaustion. It is common sense that leaders who allow their care workers greater participation in decision making along with open communication, cultivates a favourable work environment among the team. For the prevention of emotional exhaustion and subsequent burnout among hospital care workers, the Regional Development and Mental Health Company in Greece, published a guide indicating efficient rules of leadership practices [22]. Those rules encourage leaders to consult their team on decisions that affect them; advise and encourage their staff, help them exercise their tasks, strengthen their skills, respect and reward their work; assign work tasks equally; show comprehension for their personal problems; demonstrate respect for their privacy; respect their moral values; avoid gossip; and enhance a pleasant and decent environment. Obviously, the core of these rules relies on the creation of a climate of mutual trust [22], as supported by the WHO definition of leadership [24].

Once again, human factor seems to play a key role in promoting health and wellbeing of care workers. Such findings underscore the pivotal role of leaders in protecting care workers against emotional exhaustion, and encourage the modification of environmental characteristics, i.e. leadership practices, in order to alter the undesired care worker outcome, i.e. emotional exhaustion [21]. Practically, leadership, being an important factor in promoting care workers` health, enhances the retention of healthy care workers, and ensures subsequent quality care those patients deserve [20]. Future studies should conduct interventions with longitudinal observations on specific leadership styles and behaviours in order to clarify critical components of leaders` practice and its impact on care workers.

6.2.3 Health-and-presenteeism-related rationing of care

In recent clinical and epidemiological research, we observe the use of presenteeism, i.e. measurement of at work decrements in job performance due to illness, as the newest work outcome assessment approach [25]. The growing interest in presenteeism stems from the fact that people are staying longer hours at work [26], and from the unmeasured impact of their physical and mental health on work performance [25]. Presenteeism is measured by self-report, partly because parameters such as task performance, or work effort at the individual worker level are increasingly difficult to collect [25]. Scales that measured on-the-job impact of physical and mental health problems embrace four dimensions [27], which included time management, physical job tasks, mental and interpersonal job tasks, and output tasks. The latter accounts for the ability to carry the workload, achieve quantity and quality standards, and complete work on time [25]. Mental health

problems such as fatigue [28, 29] and depression [25, 29, 30] as well as headaches [29] were found associated with a reduction in job performance, irrespective of their severity. In an attempt to explore the impact of hospital nurse fatigue on work performance measures, Barker (2011) observed that physical and emotional fatigue are associated short-cuts in patient care and non-compliance with existing organizational standards for safe patient handling [28].

Implicit rationing of care, omission of care, or missed care, three different conceptual definitions and operationalization [31] referring to any aspect of essential patient care that is omitted (either in part or in whole) or delayed [32]. Studies have observed that communication breakdown and patients` workload [32], inadequate staffing, and time pressure can result in withholding partially or fully necessary nursing tasks [31, 33]. One of this dissertation`s key findings, is the connection between compromised physical and mental health and self-reported rationing of care (**Chapter 4**). To the best of our knowledge, this is the first study that explores the impact of care workers perceived health and presenteeism on rationing of care by proxy, in nursing homes. The findings of this study revealed a possible inconsistency relative to the nursing practice. While care workers are taught appropriate nursing standards of care in their basic nursing education and training, and reinforced by policies and procedures at the workplace [32], they continue to report rationing of necessary care. A plausible explanation to this association is that pain and health limitations come in the way of fulfilling adequate and necessary care to residents. Unfortunately, when care workers do not fulfill their tasks as per professional practice standards, they often report distress and job dissatisfaction [32]. In this case, the critical impacting element is compromised health. Negative job experiences, such as job dissatisfaction, can provoke the care worker to leave the organization, and worsening staff shortage. Additionally, the act of rationing necessary care is considered a patient error [32], which may lead to an adverse patient outcome [34, 35]. In light of this finding, it is imperative to deal with rationing of care as a correlate of quality of care [36], due to its potential negative consequences on both, care workers and residents.

This dissertation has contributed to the existing body of knowledge on organizational determinants of implicit rationing of care [31-33, 36], the impact of perceived health and presenteeism. Our findings confirmed that perceived health and attending to work despite illness influence care workers` job performance by increasing the odds of implicit rationing of care. However, underscoring the study findings does not do justice to the depth of the problem. Nurse managers and leaders need to inquire about the impact of care workers` compromised health and presenteeism on the provision of necessary care. Individuals with physical and mental health issues might benefit from work-focused interventions [37] to address barriers to effective job performance and reduce rationing of care. Furthermore, they may learn new approaches in time management, work output, and physical tasks in order to manage their job demands [37]. The results reported here are limited by the fact that assessment of rationing of care and presenteeism is based on self-reports

and single item measure, respectively. Thus, future studies are required to perform objective assessments and collect independent data measures in relation to rationing of care, and use validate existing scale in the measure of presenteeism. Moreover, other measures than rationing of care are needed in order to elucidate the relationship between compromised health, presenteeism, and job performance in healthcare, especially nursing homes.

6.3 Theoretical background, conceptualization and measurements of care workers` health

Our findings raise questions on the underlying assumptions of *how* work environment aspects (e.g. leadership and adequate staffing) promotes care workers` health and wellbeing. To date, no theoretical model has explored (1) how care workers` health is related to care worker professional (e.g. presenteeism) and clinical performance outcomes (e.g. rationing of care) and (2) how work environments can be modified, accordingly.

Due to lack of existing models that guide occupational health and safety research, we selected the World Health Organization Model for Healthy Workplace based on the following criteria: (1) comprehensive and covering the key areas that shape the workplace, (2) simple, avoiding complex scientific constructs hard to operationalize, (3) useful in providing guidance for program development in promoting healthy workplaces, and (4) can be used by policy makers and practitioners. In light of the empirical findings described in the four sub-studies (**Chapter 2** to **Chapter 5**), along with scarcity in occupational health models, critical reflections on theory will be necessary regarding the conceptualization and measurement of care workers` health, its determinants, and its outcomes. Our three sub-studies (**Chapter 2, Chapter 3,** and **Chapter 4**) supported the model hypothesis where a relationship between care workers` health and various work environment aspects –although not causal- was found; our results confirm its proximity to nursing outcomes. However, the model provides neither a clear definition of care worker productivity and job performance (**Chapter 4**), nor descriptions of how to measure care worker-related constructs in healthcare organizations (**Chapter 4** and **chapter 5**).

International evidence showed the existence of various conceptualization models to guide health research in quality of care and patient safety (e.g. Donabedian's Structure, Process, Outcome Model, Vincent's Accident causation Model, Meikirch Model) [38-41], but not one standard model tailored to care workers` occupational health and safety. The Meikirch model is tailored to the population health (e.g. patients), and does not describe the operationalization of its determinants. Hence, the application of this model to explore nursing outcomes (e.g. presenteeism, job satisfaction, and rationing of care) can be challenging. Furthermore, the Donabedian Model focusing on the quality of care, and the Vincent`s Model concentrating on patient safety, both provided limited

description of either the structure or the processes regarding care workers health respectively, and no guidance for system aspects modeling and improvement strategies were provided [40].

In 1946, the preamble of the World Health Organization`s (WHO) constitution defined health as a state of "*complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity"* [38]. However, the focus of public policy has shifted considerably in the past two decades. From a strict definition of occupational safety and health that is concerned merely with the prevention of occupational injuries and illnesses, it is now moving towards a more encompassing concept geared towards the overall protection of workers' health, the maintenance of their working capacity and the improvement of the working environment in a manner that promotes and sustain a safer and healthier workplaces [39]. Promoting the health of individuals is a complex endeavor as it is dependent upon individuals, communities, governments, health professionals, administrators, and others whose activities interweave [38]. More recent, the Meikirch Model on population health [38] posits that health "*is a state of well-being emergent from conductive interactions between individuals `potentials, life`s demands, and social and environmental determinants".* These determinants interact and modify both the demands of life and the individuals` potentials to respond satisfactorily to these demands. There is an established link between the environment, development, and health [42]. The shared understanding of inaugurating an appropriate and enabling environment that ensures and promotes health supports the ongoing efforts (e.g. WHO definition of health) to contribute to the individual`s health [38].

The lack of either a solid theoretical grounding or a conceptual framework in occupational health continues to impede the measurement and operationalization of care workers` health, its determinants and its outcomes. To date, some agreement exists between researchers that one`s surrounding influences the overall health [38]. Overcoming the limitations of existing models used in healthcare research (e.g. Donabedian` s, Vincent` s, and Meikirch` s), the WHO model has both explanatory and predictive power in depicting and modeling unhealthy workplaces. The conceptual strength of our proposed model lies in its clear constructs of interest and why they relate to each other in the way they were proposed [43]. It is central for providing a view of the whole influencing domains instead of focusing on only one aspect of the work environment, and treating that aspect in isolation. It characterizes the interaction between care workers and their work environment in a comprehensive and coherent manner, where identification of hazards and interventions can be easily determined. Furthermore, it defines if a change in one factor in the workplace leads to specific outcomes. It proposes clear boundaries for the constructs of workplace hazards, which would alleviate the dilemma that results from multiple and conceptually overlapping measures [43]. Moreover, the model demonstrates the existence of a relationship between independent and dependent variables [43], in this case, the hypothesized relationship between unhealthy workplaces and compromised physical and mental health. One disadvantage of this approach is that it does not

address the interventions that policy makers and local authorities should take to influence the health of care workers. As a result, examples of effective or ineffective interventions were not mentioned in the description of the model [44].

6.4 Strengths and limitations of methods

Using cross-sectional care worker survey data, this dissertation thesis is embedded in the Swiss Nursing Home Human Resource Project (SHURP) -the largest nursing home outcome study conducted to date in Switzerland. The methodological strengths and limitations of such a dissertation project depend on the method used in the parent study. Therefore, the strengths and limitations of this dissertation project have to be viewed in light of its relationship to the SHURP study protocol [45].

SHURP used a cross-sectional study design and observational research methods. Using typical study designs provide a glimpse of the organizational behaviour at a particular point in time. Therefore, as it follows no chronological interactions, no cause and effect relationship can be confirmed or refuted. Although the development of this dissertation`s aims were guided by a conceptual model, the results of correlation and regression analysis, such as the relationship between care workers` perceived health and other organizational variables and nursing outcomes do not allow causal interpretation.

Another factor to consider is avoiding systematic measuring errors in relation to data collection, specifically common method variance [46]. Correlations between items measured using the same method can be a source of behavioural research bias [46]. Recommendations have been made to overcome common method variance. In this study, to avoid the burden of participants to respond according to social expectations, confidentiality was communicated and guaranteed to all participants. Furthermore, all constructs were clearly separated with respect to the content using separate Likert-type scales.

SHURP collected data on important care worker-related organizational factors relating to nursing outcomes and resident safety from a nation-wide Swiss nursing home sample. SHURP included a stratified random sampling procedure for nursing home facilities considering language region and facility size. Our sample included 163 nursing homes from all three Swiss language regions (German, French, and Italian) and nursing home sizes (small <50 beds, medium 50-99 beds, and large >100 beds), allowing us to compare findings across nursing home facilities on a national level. However, based on the SHURP study protocol [45], we only included formally acknowledged nursing homes with a capacity of at least 20 beds and 15 care workers, respectively. Retirement homes and assisted living facilities were not included. Given these inclusion criteria, facilities with a small number of resident beds (< 20 beds) and direct care providers (<15 care workers) were underrepresented in relation to their portion to the total nursing home population, which increases the

risk for sample selection bias. Hence, we are not sure if our findings can be transferred to these smaller facilities. Moreover, in quantitative research, the question remains on whether its results are generalizable to other settings and international contexts. In fact, the selection of a representative sample of the nursing home population using a random method strategy enables statistical generalisation [47].

The large overall sample size of care workers (N=5,323) was a strength for this dissertation, because it ensured enough power to detect meaningful differences [48] and statistically significant results [49]. It also helped estimating the precision that the study will yield, and combat uncertainty [48]. Equally important, the large sample size is essential in interpreting the relevance of findings with regard to the sample itself [48]. The overall high questionnaire response rate (76%) allowed robust data analyses on critical care worker-related organizational aspects, including perceived physical and mental health status. High response rates are an indication of a nonresponse bias, accuracy and reliability of survey data [49]. At the level of interest (e.g. facility or unit level), a response rate of 76% shows high consistency of response, which justifies aggregation of care workers` responses at the unit level [50].

Finally, this dissertation relied solely on care workers perception of work environment in the analysis of outcome measures (health, presenteeism, absenteeism, rationing of care, and job satisfaction). As care workers were asked to report whether they suffered from physical and mental health problems in the past four weeks prior to the survey, difficulties in relating non-work related health issues and chronic illnesses to work conditions might have contributed to bias, affecting the reliability and validity of our outcome measures. In Switzerland, national data registries (e.g. SUVA Insurance Plus) exist for compensation claims regarding occupational injuries and illnesses (musculoskeletal injuries, emotional exhaustion, and burnout), which can be used to better validation of outcome measures. While we acknowledge that care workers` report represent a major limitation of this dissertation, as we were not able to validate those reports, evidence has supported self-rated health in predicting health incidents and pain [51].

6.5 Implications for practice

The growing demand for long-term care services and the pressure to provide adequate and high quality of care to residents, protecting them from harm related to the provision of care, put nursing homes even more under pressure to assure a safe and healthy workplace for care workers. Creating a safe work environment demands a broad range of activities. With regard to physical health, it is important for care workers and nursing administrators to learn about environmental factors that contribute to musculoskeletal pain and to assist care workers in avoiding back and joint injuries by advocating for safer lifting, handling, and patient movement practice, anchored by a team of work, especially for those working in nursing homes. International agencies` initiatives, such as the

European Agency for Safety and Health at Work (EU-OSHA) [52, 53] and the Occupational Safety and Health Administration (OSHA) in the U.S. [54] obliged health organizational leaders to take preventive and appropriate measures to make the workplace healthier and safer. For example, the EU-OSHA [52] introduced the principle of risk assessment as a key element and defined its main elements as part of the general management process (e.g. hazard identification, including psychosocial risk hazards [53], worker participation, and introduction of adequate measures with the priority of eliminating risk at source). In the same line, the OSHA introduced strict guidelines for the prevention of musculoskeletal injuries in nursing homes [54]. Additionally, when adequate human resources and assistance are provided for the required physical constraints, the care worker will not be put in a position of non-compliance with the organization standards and safety procedures [8]. For care workers reporting compromised mental health, specific intervention programs need to be designed to help reduce emotional exhaustion and other related symptoms (e.g. tiredness). The provision of proper care and support for individuals experiencing work-related health issues is both an ethical and a wise business decision [8]. These individuals may reduce their intention to leave, lower turnover rates [55], which are important factors in continuity of care and, ultimately, improve resident outcomes [8]. Although methods (e.g. training) and tools (e.g. ergonomic equipment) might help, our findings stress human factors to have the impact on both physical and mental health in the work environment: poor leadership, staffing inadequacy, and conflict and lack of recognition. Senior leadership accountability is a key factor for promoting and sustaining a facility-wide safety for its staff, improving working relationships within and across teams, and facilitating two-way communication. When guidelines are amended, and nursing home facilities offer more and consistent assistance to their care workers, reported compromised health decline [8]. Engaged nursing home facilities and unit leaders can drive improvement in the workplace by designing strategies that guide safe working process and outcomes. Information and education on protective psychosocial work environment factors are an important aspect in this regard. However, unless leaders in the work environment provide enough staff qualified to support the enactment of safe work practices that they are disseminating to their staff, these efforts may go unsuccessful. Another key element of many effective interventions is job design, either through a micro-ergonomic approach (i.e. reducing workload), or through a macro-ergonomic approach (i.e. job redesign and organizational change) [16]. Leaders can help maintain a balance by regulating the number of demands placed on the care worker, both in terms of workload and redesigning jobs to remove unnecessary tasks [16]. Seeking their input and feedback in job redesign, care workers will feel greater involvement in decision making and better communication exchange [16].

Furthermore, recognizing the influence of health and presenteeism on job performance, including rationing of care, healthcare leaders should consider interventions that increase the possibilities for care workers with compromised health to either stay home or allow working according

to their abilities [56]. The availability of unconditional paid sick leave is a first step in limiting the impact of presenteeism. Managers should reinforce the availability of unrestricted paid sick leave and systematic processes for screening care workers who report or demonstrate any type of illness. These noted strategies can be a real opportunity to promote resident safety [57]. In light of the impacts of health and presenteeism, and on the path to high accountability and reliability, nursing home leaders need to develop and implement comprehensive and measurable models that assess and evaluate care workers` job performance in relation to working while ill, following the standards of care. Although the complex relationship between rationing of care due to illness and quality of care has not been explored to date, assessing aspects of job performance can be beneficial for resident safety [58]. This opportunity offers increased awareness of care workers about resident safety and safe practices. Nursing homes` assessments and evaluations can be compared across units and facilities in order to perform benchmarking and comparisons. Typical data help underscoring not only rationing of care, but also several other aspects of job performance, to allow specific interventions tailored to needs. Engaged facilities in the safety and wellbeing of their care workers foster even more job satisfaction and reduction of turn over. It is hence important that leaders and care workers are informed via appropriate indicators of the determinants and impacts of health and safety, which paint a picture of the state of the workplace infrastructure, [39].

6.6 Implications for future research

Despite the contribution of this dissertation, further analysis is needed to deepen our understanding of the relationships between care worker-reported health, organizational system variables, job performance, and quality of resident care. In an era when it's imperative that all possible avenues for improving the quality of care and decreasing health care costs be explored [58], we hope that the results of the four sub-studies of this dissertation will be a stepping-stone to prompt further investigation.

First, the associations between care workers perceived health and major organizational variables in Swiss nursing homes should be retested using more reliable outcome measures, preferably data from objective assessments of care workers health, including formal work-related sick leaves, physical exams, compensation claims, and incident reports on injuries and accidents. Such analyses would add to evidence on work environment-related health by providing stronger evidence on relationships with other variables. Second we need to expand our knowledge both of how health and presenteeism are related to job performance aspects, in addition to rationing of care, and how these factors affect resident safety and quality of care. To date, studies on presenteeism, including this dissertation, have looked too narrowly at this behavior and its implications on job performance measures. The Stanford Presenteeism Scale [59] serves as a useful assessment tool on worker health and performance. It captures two dimensions of presenteeism, including the focus on work

process (i.e. one`s ability to focus on work without being distracted by health problems) and work outcome (i.e. completing work). Using this scale, future studies are recommended to test association of presenteeism with resident outcomes and quality of care.

Studies need to move beyond the tendency to use observational designs. The use of moderators and mediators, rather than isolated regression analysis, helps clarifying relationships between various constructs and advances knowledge on resident safety and high quality of care in relation to staff presenteeism. Additionally, intervention studies, aiming at ultimately improving resident quality of care, would further contribute to the nursing home work environment and care workers` health. Incorporating a range of individual and organizational interventions may create a healthy and safe work environment as well as behavior change. So far, the evaluation of workplace health interventions is somewhat limited [44]. In view of that, the WHO conceptual model might provide guidance for testing indirect effect between organizational variables-related health and presenteeism (e.g. psychosocial work environment), job performance measures (e.g. rationing of care), and resident outcomes. It can also provide a useful support for program development and implementation.

Taking an international perspective, a much stronger investigation of presenteeism and job performance aspects (i.e. rationing of care) is needed to improve our understanding of these two concepts in nursing homes, and to develop an integrative framework on how, and in what area, working despite illness affect job performance, and ultimately, quality of care. The Work Limitation Questionnaire is a reliable and valid self-report instrument for measuring the degree to which health problems interfere with ability to perform job exigencies [27]. The above-mentioned questionnaire is context driven and focuses on job requirement performance, which can be applied in the nursing home setting to identify the magnitude and type of deficit that health problems are having in the workplace [27]. To complement this research topic, qualitative studies can be of use to develop stronger theoretical base for the concepts of both presenteeism and job performance, as well as for quality of care. Focused interviews could be an approach to discuss care workers` perceptions of their at-work performance during illness, and how they rate quality of care accordingly, in order to develop common understandings relevant to these concepts. The overall aim is to develop indicators for job performance in relation to quality of care pertinent to the nursing home setting.

6.7 Conclusions

Adding to the record of science development and benefits to the healthcare field, SHURP has contributed to care workers` health in exploring its determinants and outcomes in the nursing home setting. Compromised health, such as back pain, joint pain, tiredness, sleeplessness, headache, and emotional exhaustion are commonly reported among care workers. Typical for a high risk work setting like the nursing home, sustaining a healthy work environment to promote care

workers` health and wellbeing, necessitates an anticipatory approach to overcome deficiencies in the psychosocial work environment system. Investigating care workers` perceptions on measurable work environment factors reflecting the level of workplace safety, can help detecting problematic system conditions in terms of human factors related to perceived health and subsequent outcomes.

This dissertation adds to the existing body of knowledge, offering a comprehensive view of the effect the work environment on care workers health, and of health on rationing of care, and job satisfaction. Our findings confirmed the underlying theoretical assumption that safe work environments are related to healthy care workers, and subsequent better job performance. Although our results suggested that care workers` health, especially back pain and emotional exhaustion, is of concern in many Swiss nursing home facilities, and the need for promotion and improvement, it remains less clear how would sustaining the health of care workers improve quality of care in relation to job performance (e.g. reducing rationing of care). While contributing further to the knowledge of care workers` health in nursing homes, and the influential aspects of the work environment, this dissertation thesis raises methodological issues that warrant further attention in future studies.

6.8 References

1. Zuniga, F., et al., *Are Staffing, Work Environment, Work Stressors, and Rationing of Care Related to Care Workers' Perception of Quality of Care? A Cross-Sectional Study.* J Am Med Dir Assoc, 2015. **16**(10): p. 860-6.
2. Aiken, L.H., et al., *Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction.* Jama, 2002. **288**(16): p. 1987-93.
3. Clarke, S.P., *Hospital work environments, nurse characteristics, and sharps injuries.* Am J Infect Control, 2007. **35**(5): p. 302-9.
4. Kim, S.S., et al., *Association between perceived inadequate staffing and musculoskeletal pain among hospital patient care workers.* Int Arch Occup Environ Health, 2014. **87**(3): p. 323-30.
5. June, K.J. and S.H. Cho, *Low back pain and work-related factors among nurses in intensive care units.* J Clin Nurs, 2011. **20**(3-4): p. 479-87.
6. Trinkoff, A.M., et al., *Staffing and worker injury in nursing homes.* Am J Public Health, 2005. **95**(7): p. 1220-5.
7. Lamy, S., et al., *Role of the work-unit environment in the development of new shoulder pain among hospital workers: a longitudinal analysis.* Scand J Work Environ Health, 2014. **40**(4): p. 400-10.
8. Graham, P. and J.P. Dougherty, *Oh, their aching backs!: occupational injuries in nursing assistants.* Orthopaedic Nursing, 2012. **31**(4): p. 218-223.
9. Mark, B.A., et al., *Does safety climate moderate the influence of staffing adequacy and work conditions on nurse injuries?* J Safety Res, 2007. **38**(4): p. 431-46.
10. D'Arcy, L.P., Y. Sasai, and S.C. Stearns, *Do assistive devices, training, and workload affect injury incidence? Prevention efforts by nursing homes and back injuries among nursing assistants.* Journal of Advanced Nursing, 2012. **68**(4): p. 836-845.
11. Stone, P.W. and R.R. Gershon, *Nurse work environments and occupational safety in intensive care units.* J Nurs Adm, 2009. **39**(7-8 Suppl): p. S27-34.
12. Bass BM, *Bass and Stogdill's handbook of leadership: theory, research and managerial applications.* 1990, Free Press: New York.
13. Bakker, A.B., et al., *Effort-reward imbalance and burnout among nurses.* J Adv Nurs, 2000. **31**(4): p. 884-91.
14. Peters, V.P., A.E. de Rijk, and N.P. Boumans, *Nurses' satisfaction with shiftwork and associations with work, home and health characteristics: a survey in the Netherlands.* J Adv Nurs, 2009. **65**(12): p. 2689-700.

15. Willemse, B.M., et al., *The moderating role of decision authority and coworker- and supervisor support on the impact of job demands in nursing homes: a cross-sectional study.* Int J Nurs Stud, 2012. **49**(7): p. 822-33.
16. Eatough, E.M., J.D. Way, and C.H. Chang, *Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints.* Appl Ergon, 2012. **43**(3): p. 554-63.
17. Lee, H., et al., *Impact of leadership development on emotional health in healthcare managers.* J Nurs Manag, 2010. **18**(8): p. 1027-39.
18. Rowney J.I.A. and C. A.R., *A preliminary investigation of burnout dimensions in intact work groups*, in *International Congress of Psychology*. 1988: Sydney, Australia.
19. Ch., B., *The nature of leadership in leadership, classical, contemporary and critical approaches* 1997: Oxford University Press.
20. Laschinger, H.K., C.A. Wong, and A.L. Grau, *Authentic leadership, empowerment and burnout: a comparison in new graduates and experienced nurses.* J Nurs Manag, 2013. **21**(3): p. 541-52.
21. Madathil, R., N.C. Heck, and D. Schuldberg, *Burnout in psychiatric nursing: examining the interplay of autonomy, leadership style, and depressive symptoms.* Arch Psychiatr Nurs, 2014. **28**(3): p. 160-6.
22. Papathanasiou, I.V., et al., *Motivation, leadership, empowerment and confidence: their relation with nurses' burnout.* Mater Sociomed, 2014. **26**(6): p. 405-10.
23. Stordeur, S., W. D'Hoore, and C. Vandenberghe, *Leadership, organizational stress, and emotional exhaustion among hospital nursing staff.* J Adv Nurs, 2001. **35**(4): p. 533-42.
24. WHO, *Human resources and training in mental health*, in *Mental Health Policy and Service Guidance Package*. 2005, WHO: Geneva, Switzerland. p. ch. 4.
25. Lerner, D. and R.M. Henke, *What does research tell us about depression, job performance, and work productivity?* J Occup Environ Med, 2008. **50**(4): p. 401-10.
26. OECD, *OECD Factbook 2007: economic, environmental and social statistics*. 2007.
27. Lerner, D., et al., *The Work Limitations Questionnaire.* Med Care, 2001. **39**(1): p. 72-85.
28. Barker, L.M. and M.A. Nussbaum, *Fatigue, performance and the work environment: a survey of registered nurses.* J Adv Nurs, 2011. **67**(6): p. 1370-82.
29. Kessler, R., et al., *Comparative and interactive effects of depression relative to other health problems on work performance in the workforce of a large employer.* J Occup Environ Med, 2008. **50**(7): p. 809-16.
30. Allen, H., Z. Hyworon, and A. Colombi, *Using self-reports of symptom severity to measure and manage workplace depression.* J Occup Environ Med, 2010. **52**(4): p. 363-74.

31. Ausserhofer, D., et al., *Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study.* BMJ Qual Saf, 2014. **23**(2): p. 126-35.
32. Kalisch BJ, L. G, and W. RA., *Missed nursing care: errors of omission.* Nurs Outlook 2009. **57**(1): p. 3-9.
33. Zuniga, F., et al., *The relationship of staffing and work environment with implicit rationing of nursing care in Swiss nursing homes--A cross-sectional study.* Int J Nurs Stud, 2015. **52**(9): p. 1463-74.
34. Schubert, M., et al., *Rationing of nursing care and its relationship to patient outcomes: the Swiss extension of the International Hospital Outcomes Study.* Int J Qual Health Care, 2008. **20**(4): p. 227-37.
35. Reason, J., *Human Error*. 1990, New York, NY: Cambridge University Press.
36. Ball JE, et al., *'Care left undone' during nursing shifts: associations with workload and perceived quality of care.* BMJ Qual Saf, 2014. **23**: p. 116-125.
37. Adler, D.A., et al., *Job performance deficits due to depression.* Am J Psychiatry, 2006. **163**(9): p. 1569-76.
38. Bircher, J. and S. Kuruvilla, *Defining health by addressing individual, social, and environmental determinants: new opportunities for health care and public health.* J Public Health Policy, 2014. **35**(3): p. 363-86.
39. Pouliakas K and Theodossiou I, *An inquiry into the theory, causes and consequences of monitoring indicators of health and safety at work*. 2010, Institute for the Study of Labor: UK.
40. Carayon, P., et al., *Work system design for patient safety: the SEIPS model.* Qual Saf Health Care, 2006. **15 Suppl 1**: p. i50-8.
41. Vincent, C., S. Taylor-Adams, and N. Stanhope, *Framework for analysing risk and safety in clinical medicine.* Bmj, 1998. **316**(7138): p. 1154-7.
42. Haines, A., et al., *From the Earth Summit to Rio+20: integration of health and sustainable development.* Lancet, 2012. **379**(9832): p. 2189-97.
43. Mark, B.A., L.C. Hughes, and C.B. Jones, *The role of theory in improving patient safety and quality health care.* Nurs Outlook, 2004. **52**(1): p. 11-6.
44. Burton, J., *WHO health workplace framework and model: background and supporting literature and practice*. 2010, WHO Headquarters: Geneva, Switzerland.
45. Schwendimann, R., et al., *Swiss Nursing Homes Human Resources Project (SHURP) protocol of an observational study.* J Adv Nurs, 2013. **70**(4): p. 915-926.
46. Chang, S.-J., A. van Witteloostuijn, and L. Eden, *From the Editors: Common method variance in international business research.* Journal of International Business Studies, 2010. **41**(2): p. 178-184.

47. Polit, D.F. and C.T. Beck, *Generalization in quantitative and qualitative research: myths and strategies.* Int J Nurs Stud, 2010. **47**(11): p. 1451-8.
48. Biau, D.J., S. Kerneis, and R. Porcher, *Statistics in brief: the importance of sample size in the planning and interpretation of medical research.* Clin Orthop Relat Res, 2008. **466**(9): p. 2282-8.
49. Polit, D. and C. Beck, *Nursing research. Generating and assesing evidence for nursing practice*, ed. t. ed. 2008: Lippincott Williams & Wilkins.
50. Bliese, P., *Within group agreement, non independence, and reliability: implications data aggregation in multilevel theory, research, and methods in organizations: foundations, extensions, and new directions*, E. K.J. Klein and S.W.J. Kozlowski, Editor.: Jossey-Bass Inc.: San Francisco.
51. Palmer, K.T., et al., *Population-based cohort study of incident and persistent arm pain: role of mental health, self-rated health and health beliefs.* Pain, 2008. **136**(1-2): p. 20-37.
52. EU-OSHA, *The OSH Framework Directive. .* 2013.
53. EU-OSHA, *European survey of enterprises on new and emerging risks (ESENER): managing safety and health at work.* 2010, European Union: Luxembourg, Publications Office of the European Union.
54. OSHA, *Ergonomics for the prevention of musculoskeletal disorders*, in *Healthcare Risk Management*. 2009, Occupational Safety and Health Administration: U.S. p. 1-40.
55. Piko, B.F., *Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: a questionnaire survey.* Int J Nurs Stud, 2006. **43**(3): p. 311-8.
56. Alavinia, S.M., D. Molenaar, and A. Burdorf, *Productivity loss in the workforce: associations with health, work demands, and individual characteristics.* Am J Ind Med, 2009. **52**(1): p. 49-56.
57. Widera, E., A. Chang, and H.L. Chen, *Presenteeism: a public health hazard.* J Gen Intern Med, 2010. **25**(11): p. 1244-7.
58. Letvak, S.A., C.J. Ruhm, and S.N. Gupta, *Nurses' presenteeism and its effects on self-reported quality of care and costs.* Am J Nurs, 2012. **112**(2): p. 30-38; quiz 48, 39.
59. Koopman, C., et al., *Stanford presenteeism scale: health status and employee productivity.* J Occup Environ Med, 2002. **44**(1): p. 14-20.