Implications of population aging and resulting multiple social responsibilities on health outcomes of the workforce

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Implications of Population Aging and Resulting Multiple Social Responsibilities on Health Outcomes of the Workforce

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Zusammenfassung

Die Alterung der Bevölkerung ist ein globales Phänomen und resultiert in gesellschaftlichen Herausforderungen. In diesem Zusammenhang werden meist der finanzielle Druck auf die Rentensysteme sowie die Finanzierbarkeit der Gesundheitsversorgung und der Langzeitpflege diskutiert. Daher ist es unerlässlich optimale Arbeits- und Lebensbedingungen zu schaffen, um bis zum Rentenalter und darüber hinaus gesund zu bleiben und das Arbeitskräftepotenzial auszuschöpfen. Das Ziel der ersten Studie war es zu untersuchen, welche Lebensbereiche in der Schweiz und ihren Nachbarländern den grössten Einfluss auf die allgemeine Lebenszufriedenheit und die selbsteingeschätzte Gesundheit der Erwerbstätigen hat. In allen Populationen war die allgemeine Lebenszufriedenheit stark mit der selbsteingeschätzten Gesundheit assoziiert und die Zufriedenheit mit der finanziellen Situation sowie die Arbeitszufriedenheit zeigten direkte Auswirkungen auf die selbsteingeschätzte Gesundheit. Die Bedeutung der einzelnen Lebensbereiche für die allgemeine Lebenszufriedenheit und die selbsteingeschätzte Gesundheit variierte zwischen den Ländern und wir konnten kein klares geographisches Muster feststellen.

Die Alterung der Bevölkerung führt zu einer höheren Nachfrage nach Pflegeleistungen, was wiederum einen erhöhten Bedarf nach informeller Pflege als Ergänzung zur professionellen Gesundheitsversorgung nach sich zieht. In der zweiten Studie untersuchten wir, ob sich Personen im erwerbsfähigen Alter mit zusätzlichen Betreuungsfunktionen für minderjährige Kinder ("Eltern") oder Erwachsene (informelle Betreuer) oder mit der Kombination beider Rollen (informelle Betreuer mit minderjährigen Kindern) bezüglich der selbsteingeschätzten Gesundheit unterscheiden. Zum Beginn der Studie schätzten männliche informelle Betreuer mit und ohne minderjährige Kinder ihre eigene Gesundheit schlechter ein als Personen ohne Betreuungsrolle. Allerdings verbesserte sich die selbsteingeschätzte Gesundheit innerhalb eines Jahres im Vergleich zu den Personen ohne Betreuungsrolle. Diese Assoziationen konnten wir bei den weiblichen Studienteilnehmern nicht feststellten.

Gesundheitsfachleute übernehmen besonders häufig die Rolle eines informellen Betreuers, falls jemand im eigenen sozialen Umfeld auf Pflegeleistungen angewiesen ist. Das erhöhte Burnout Risikos von Gesundheitsfachleuten im Vergleich zur Allgemeinbevölkerung ist bekannt. Wir haben deshalb in der dritten Studie das Burnout Risiko von Gesundheitsfachleuten im Spitalbereich mit zusätzlichen Betreuungsaufgaben für minderjährige Kinder (double-duty child caregiver) oder pflegebedürftigen Erwachsenen (double-duty adult caregiver) und denjenigen, die diese beiden zusätzlichen Betreuungsaufgaben kombinieren (triple-duty caregiver), untersucht. Zudem analysierten wir, ob diese Verbindung durch Stress aus einem Konflikt zwischen Arbeits- und Privatleben (work-privacy conflict) erklärt werden kann. Gesundheitsfachleute mit zusätzlichen Betreuungsaufgaben für minderjährige Kinder und pflegebedürftige Erwachsene (triple-duty caregiver) wiesen ein höheres Burnout-Risiko im Vergleich zu Gesundheitsfachpersonen ohne zusätzliche Betreuungsaufgaben auf. Der Konflikt zwischen Arbeits- und Privatleben konnte das höhere Burnout-Risiko der triple-duty caregivers nur bei medizinisch-therapeutischen und medizinisch-technischen Fachpersonen sowie beim akademischem Personal erklären, nicht aber bei Pflegenden oder Ärzten.

In der vierten Studie untersuchten wir, ob Stress, welcher durch ein Ungleichgewicht zwischen Arbeitseinsatz und Belohnung (effort-reward imbalance) am Arbeitsplatz entsteht das Burnout Risiko mehr beeinflusst als Stress, welcher aus einem Ungleichgewicht zwischen Arbeits- und Privatleben resultiert, und ob diesbezüglich ein Unterschied zwischen den Berufsgruppen besteht. Der Konflikt zwischen Arbeits- und Privatleben war bei allen im Gesundheitssektor tätigen Fachkräften ausgeprägt und stärker als der Stress durch Ungleichgewicht zwischen Arbeitseinsatz und Belohnung mit dem Burnout Risiko assoziiert. Das Ungleichgewicht zwischen Arbeitseinsatz und Belohnung hatte nur Einfluss auf das Burnout Risiko von medizinischem Personal mit Ausbildung auf Tertiärstufe.

Zusammenfassend lässt sich schliessen, dass die Arbeit und die Arbeitsumgebung die wichtigsten Lebensbereiche für die selbsteingeschätzte Gesundheit sind. Um den Effekt von Gesundheitsförderung und Sozialpolitik zu optimieren, schlagen wir vor, Lebensbereiche zu identifizieren, welche einen substantiellen Einfluss auf die Gesundheit in der Zielpopulation haben. Darüber hinaus sind repräsentative Statistiken zum Gesundheitszustand informeller Betreuungspersonen nötig, da diese im

Vergleich zu Personen ohne Betreuungsrolle einen tendenziell schlechteren Gesundheitszustand aufweisen. Maßnahmen zur besseren Vereinbarkeit von Beruf und Pflege sowie Maßnahmen zur Verringerung des Arbeitsstresses und zur Verbesserung der Vereinbarkeit von Arbeits- und Privatleben sind wirksame Ansätze, um das Burnout Risiko von Fachpersonen im Gesundheitswesen zu verringern, was letztlich einer besseren Kontinuität und Qualität der Pflege und damit auch der Patientensicherheit nützt.

Abstract

Population aging is a global phenomenon and results in various societal challenges. In this regard, financial pressure on the pensions schemes as well as accurate provision and financing of health care and long-term care for the elderly are most discussed. Therefore providing optimal working and living conditions to stay healthy until retirement age and exhaust the workforce potential is imperative. In the first study, we aimed to identify the life domains measured as domain satisfactions that contribute most to general life satisfaction and self-rated health for the workforce in Switzerland and its neighboring countries. Across all populations, general life satisfaction was strongly related to self-rated health and satisfaction with one's financial situation and job satisfaction showed direct effects on self-rated health. Furthermore, we found that differences in the importance of life domains for general life satisfaction and self-rated health varied between populations, but we did not detect a clear geographical pattern.

Another consequence of population aging is the increased demand for informal care to complement formal care. In the second study, we aimed to investigate whether people at working ages with additional caregiving roles for underage children ("parents") or adults ("informal caregivers") or the combination of both (informal caregivers with dependent children) differed regarding self-rated health. Whereas informal male caregivers with and without dependent children reported worse self-rated health compared to non-caregivers at baseline, no such association was found for their female counterparts. However, informal male caregivers' self-rated health ameliorated over one year compared to non-caregivers.

Health professionals often take over the role of informal caregivers when someone in their social environment relies on care, due to their expertise in caregiving. Given the well-known elevated burnout risk of health professionals compared to the general population and the stressful situation of providing informal care while being in the active workforce, we aimed to assess the burnout risk of health professionals in the hospital sector providing care to children (double-duty child caregivers) or

to dependent adults (double-duty adult caregivers) and of those combining both additional caregiving roles (triple-duty caregivers) and to investigate whether work-privacy conflict mediates this relationship. Only triple-duty caregivers revealed a higher burnout risk compared to health professionals without additional caregiving responsibilities and a work-privacy conflict only mediated this relationship in medical-therapeutic/medical-technical experts and academic staff, but not in nurses or physicians.

In the fourth study, we aimed to identify whether stress resulting from an effort-reward imbalance at work or stress resulting from an imbalance between work and private life (work-privacy conflict) is more predictive of burnout risk and to assess whether this differs between professionals groups within the healthcare setting. Work-privacy conflict was strongly and stronger than effort-reward balance related to burnout risk in all analyzed categories of health professionals. Effort-reward imbalance was only associated with burnout risk in tertiary educated medical staff.

From our four studies, we may conclude that work and working environment matter most for self-rated health. However, we suggest to assess the most important life domains for health and to target health-promotion programs and welfare policies in the life domains accordingly in order to optimize their impact on population health. Furthermore, representative statistics on the health status of informal caregivers are necessary, as they tend to report worse health than non-caregivers. Measures to facilitate work and care reconciliations as well as interventions aiming to reduce work-related stress and increase the compatibility of work and private life may be effective approaches to reducing the burnout risk of hospital employees and result in increased patients safety as well as better continuity and quality of care.

Contents

Chapter I

General Introduction

The focus of this thesis lies on the health of formal (i.e. health professionals) and informal caregivers (i.e. caring for adults in need of care). In order to introduce the relevance and timeliness of this topic, I start by discussing *Consequences of an Aging Population*, precede with issues related to *Informal Caregiving* and finish by focusing on *Occupational Stress*. Upon reviewing the relevant literature, I will continue by introducing the four studies I carried out and highlight their objectives.

Consequences of an Aging Population

Population aging

Population aging is a global phenomenon that started in the second half of the 20 century in developed countries and is expected to happen in the less developed and transitional countries is the first half of the 21 century [1]. Key drivers of population aging are the declining fertility rate and the increasing life expectancy. The fertility rate dropped from 2.6 births per woman in the European Union in 1960 to 1.6 in 2015. The decrease is mainly observed until 1998 and since then there is a small but steady increase in the fertility rate. This same trend is also observed in Switzerland; the fertility rate decreased from 2.4 births per woman in 1960 to 1.5 in 2015 [2]. On the other hand, life expectancy at birth rose from 69 years in the European Union in 1960 to 81 years in 2015. Similarly, the life expectancy at birth in Switzerland increased from 71 years to 83 years in the same time period [3]. The share of elderly i.e. people aged 60 years and above, is constantly growing, whereas the share of the oldest-old i.e. people aged 80 years and above, is increasing more rapidly than any other age group. With the exception of Japan, European countries had the highest share of elderly people (60+) in 2015. It is expected that by 2030, 25% of the European population and about 30% of the Swiss population will be older than 60 years [4].

Trends in disease and disability

This demographic shift towards aging societies affects disease prevalence and disability trends. According to Christensen et al [5] in their review, we can note that the prevalence of diseases and chronic conditions in the elderly population has increased over time, which is evident in self-reports as well as medical records. This increase partly reflects the improved health literacy and use of health services in the elderly, without changes in the medical conditions. Moreover, earlier diagnosis and better treatment options may prolong the lifetime with morbidity, while decreasing the functional limitations. Indeed, small reductions in the prevalence of disabilities have been observed in Western societies, although contradictory results are reported in other countries. Different trends are observed for health measures containing information on health status combined with life expectancy. Life years in good perceived health have been increasing over time. A recent Swedish study points to the same direction as they found an increase in life years free from severe and mild disability and suggest that this increase is mostly driven by improved health [6]. Similarly, Christensen [5] reported that life years with less severe levels of disability are increasing as well but found that life years with severe disability are declining. Whereas the Swedish study reports a compression of health problems for women and an expansion of health problems for men [6], Christensen [5] suggests a general increase in life years with morbidity. Hence, most evidence points to a postponement of disability and limitations with a concurrent increase in disease and chronic conditions.

Measures of well-being

Population aging and the resulting increase in age-related diseases and years spent in morbidity demand for measures assessing the quality of life of the population. Measures of subjective well-being and quality of life are becoming increasingly important to evaluate not only the health of a population but also the social and economic progress of a country [7,8]. The subjective perception and evaluation of life domains is a reliable and valid approach to assess well-being [7,9] because the individually perceived situation is at least as relevant as the objective conditions [7]. Life satisfaction is a broad and overall appraisal of a person's life as a whole [10] and is commonly used as a proxy for quality of

life [11]. Similarly, domain satisfaction variables (i.e. job satisfaction) represent proxy variables of life domains incorporating a broad appraisal of the targeted life domain [10]. Whereas life satisfaction is sometimes regarded as a relatively stable personality trait [12,13], it can be conceptualized as an aggregate assessment of satisfaction with different life domains (Figure 1) [14]. Such domain satisfaction variables represent proxy variables of life domains incorporating a broad appraisal of the targeted life domain [10]. Though there is some consensus about which domain satisfactions contribute to general life satisfaction, the list is not exhaustive and the individual contribution of domain satisfactions on life satisfaction as a whole remains unclear [14,15].

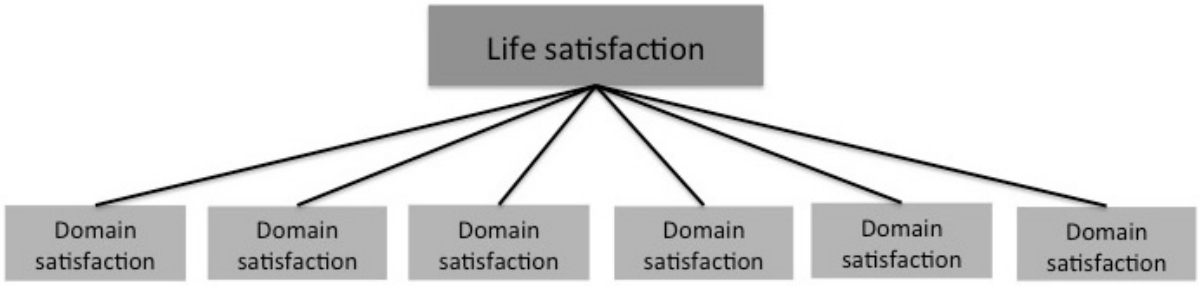

Figure 1 Life satisfaction as an aggregate assessment of various domain satisfactions

Life satisfaction is strongly associated with self-perceived health. Young people report highest levels of life satisfaction whereas lowest levels of life satisfaction are found at the mid 40s for both sexes in Europe. Then life satisfaction rises again despite a higher probability of health problems. This curvilinear relationship between age and life satisfaction has been found to be robust against cohort effects [16]. Whereas life satisfaction is influenced by age, education, and income, gender differences are marginal. However, large differences in life satisfaction are found among European countries; citizens from countries with a higher gross domestic product generally report higher life satisfaction than populations from countries with a low gross domestic product. Within Europe, Switzerland ranks among the countries with highest general life satisfaction in 2013 – the Swiss report a mean life satisfaction score of 8.0 on a scale ranging from 0 “not at all satisfied” to 10 “totally satisfied”. This score is higher than in all neighboring countries, which also substantially differ: Austrians rate their life satisfaction highest with 7.8, followed by Germans (7.3), French (7.0) and Italians (6.7) [17]. It

has been shown that cultural affiliation influences the perception and evaluation of life domains across Europe [18], and culture consequently affects the weighting of life domains for life satisfaction as a whole [19,20].

The association between life satisfaction and self-rated health is well documented and likely to be bidirectional. On the other hand, little is known about how domain satisfactions are associated with self-rated health and how culture affects these relationships. As of the cultural differences within Switzerland defined by languages areas, studying possible differences in the relationships between domain and life satisfaction and health within Switzerland and comparing with the surrounding countries offers a unique case to get insight into whether culture or nation is more determinant for a weighting of life domains with respect to health.

Consequences of population aging

We have seen that population aging affects the prevalence of diseases and disability. Moreover, the aging of the population also poses major economic, social and political challenges to society. In particular, challenges regarding the pension schemes as well as the provision of health care and long-term care for the elderly population are discussed with respect to population aging [21]. As the share of elderly persons is growing faster than the share of people at working ages as well as the fact that the baby-boomers are about to reach retirement age [22], the dependency ratio rises [21]. Hence, fewer people in the workforce need to support more retirees. In order for pension systems to remain financially sustainable, most governments are forced to take several measures including an increase the statutory retirement age [5]. Apart from the ethical and moral imperative to provide everyone with optimal conditions for healthy aging, a prolonged labor force participation of older persons demands health-promoting working and living conditions, as health is a crucial factor to participate in the labor force. Moreover, the aging of the population - especially the increase in the share of the oldest old – not only led to financial pressure on health systems; the increasing share of older persons with chronic conditions and disabilities leads to an increased demand for care services. This requires more

resources to provide care [21], either in the form of formal care provided by health professionals or informal care voluntarily provided mostly by family, friends or neighbors [23].

In summary, consequences of population aging include an increased demand for informal caregiving to complement formal care, that results in a higher share of people facing multiple social responsibilities but also elevated burnout risk in the healthcare sector due to a lack of adequate staffing [24].

Caregiving

Informal caregiving

This increased demand for healthcare services due to population aging cannot fully be provided by healthcare professionals because human and financial resources in the healthcare sector are limited. Hence, the elderly will continue to rely on informal, i.e. unpaid care provided by family, friends or neighbors [23]. Informal caregiving activities are manifold and include amongst other things assistance in personal care, housework, transportation, shopping and social activities, emotional support as well as managing and coordinating therapies and medication [25]. Whereas women have traditionally been informal caregivers, it becomes increasingly common for men to provide informal care [26,27]. Due to low fertility rates, postponed parenthood [28] and the longer lasting dependency of children on their parents [29] in combination with the increasing labor force participation of women [30], the opportunity costs to provide informal care are increasing [31]. On the other hand, the number of potential informal caregivers is declining [32] due to the higher opportunity costs, the increased mobility of people and the trend of smaller families and more childless couples compared to the past [33]. Nevertheless, some studies propose constant shares of informal caregivers [34]. However, recent information about the proportion of informal caregivers in the Swiss population is lacking. The OECD estimates that about 13% of the Swiss population over 50 years was providing informal care in 2013 [35].

Multiple social responsibilities

Whereas the fertility rate has been decreasing on a long-term basis, most recent fertility trends point to a different direction in Europe. Since the fertility rate reached its low in the European Union in 1998, we observe a small but constant increase from 1.44 to 1.58 births per women. The same trend is monitored in Switzerland; the fertility rate increased from 1.38 births per women in 2001 to 1.54 in 2015 [2]. In the same time period, the female labor force participation in the European Union and in Switzerland rose steadily since 1990 and remains stable at around 51% in the European Union in 2015 and to 63% in Switzerland in 2016 [36]. Concurrently, the age of women at first childbearing has increased in the European Union since 1980 and in Switzerland since 1975 [37]. Women's postponement of births into their 30's or even 40's results in an increased age gap between generations [38]. Nevertheless, children tend to stay longer dependent on their parents [39]. This extended support of children combined with an increasing demand for informal caregiving and the increasing labor force participation of women [36] leads at least theoretically to an increase in people facing multiple social responsibilities simultaneously [39]. Similarly to informal caregivers for elderly, recent information about the proportion of informal caregivers with underage children in the Swiss population is missing. In 1999, an estimated 6-7% of the female population aged 40-49 were informal caregivers with dependent children [40].

Whereas a small share of the working age population has informal caregiving responsibilities for dependent adults [35], a large share of the working age population has caregiving responsibility for dependent children (see chapter III). We may differentiate people with multiple social responsibilities according to their additional caregiving roles or a combination of such (Figure 2). For studying multiple social responsibilities, people are classified as parents when they are living in the same household with underage children, as caregiving responsibilities for children are arguably most intense in these situations [41,42]. People are considered to be informal caregivers either when they live in the same household with an adult person in need of care or provide informal care to a relative or another adult living outside of the household. People facing both caregiving roles i.e. living in the same

household with at least one child under 18 years and providing informal elderly care have been termed the “sandwich generation” in the literature [43].

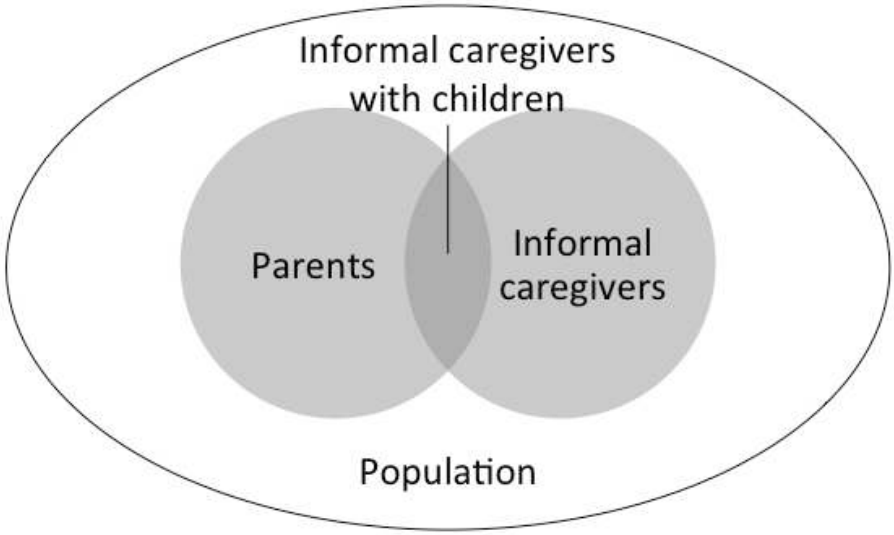

Figure 2 Classification of people with multiple social responsibilities according to their caregiving responsibilities.

Effect of multiple social responsibilities on health

As caregiving for adult persons in need of care involves time-consuming and emotionally-involving activities, there is large consensus that it has physical, psychological, social and financial implications for the informal caregiver [25]. However opinions about whether informal caregiving is stressful or fulfilling diverge.

Role theory provides three opposing perspectives as to how caregiving can affect the current health status: role strain, role enhancement, and role expansion. The role strain hypothesis implies adverse health effects of additional caregiving roles due to role overload and/or time scarcity [44]. On the contrary, the role enhancement hypothesis suggests beneficial health outcomes of additional caregiving roles as a result from status enhancement and security and personality enrichment [45]. Instead of a purely additive model, the role expansion hypothesis postulates that personal commitment to a role mitigates its effect on health [46].

The literature on effects of informal caregiving on self-rated health is inconclusive and contradictory results are found [47,48]. However, most studies point to adverse health effects for informal caregivers compared to people with no informal caregiving roles [48,49]. Likewise, most studies point to the worse self-rated health of informal caregivers with additional caregiving roles for children compared to those without caregiving responsibilities [50]. Nevertheless, no such association was found for the well-being of informal caregivers with children [51]. Sex differences in emotional health for informal caregivers with children are also reported; whereas men with such caregiving roles reported worse emotional health compared to men without informal caregiving roles, informal female caregivers with children reported better emotional health compared to their counterparts [52]. These ambiguous results may stem from different operationalizations of informal caregivers with and without children [27], different outcome measures [53], different study populations [23,27] as well as the inclusion of other covariates.

Long-term effects of informal caregiving are less investigated and there are two controversial hypotheses to explain the long-term effects of informal caregiving on health and well-being. The "wear and tear" hypothesis predicts persisting negative long-term effects because the informal caregivers' resources erode over time. Contrarily, the adaption model suggests that initial negative effects of informal caregiving disappear after an adaption phase [54].

Longitudinal studies investigating long-term effects of informal caregiving on health are scarce and reveal inconsistent results. Some find only short-term adverse health effects for informal female caregivers [55], whereas population-based studies report long-term survival benefits for informal female caregivers [56,57] and informal caregivers in general, regardless of their sex [32,58]. Another study points out long-term sex differences in the self-rated health of informal caregivers; whereas informal female caregivers report worse self-rated health, informal male caregivers report better self-rated health two years later compared to those not having any caregiving responsibilities [59].

Health professionals as informal caregivers

Health professionals provide formal care. As of their expertise in caregiving and health literacy, health professionals will commonly take over the role of an informal caregiver [60], if the situation arises that someone in the family relies on assistance. Combining formal and informal caregiving roles becomes increasingly prevalent [60–63]. Health professionals providing informal care are termed double-duty caregivers in the literature.

Similarly to the general population, we may distinguish between double-duty caregivers providing informal care to dependent children (double-duty child caregivers) or to the elderly (double-duty adult caregivers) and the sandwiched ones who combine both informal caregiving roles with their formal caregiving role (triple-duty caregivers) (Fig 3). Double- and triple-duty caregivers are also associated with negative health outcomes [60,61] and report higher occupational stress such as more work-family conflict than non-caregivers [62]. Studies focusing on the burnout risk of double- and triple-duty caregivers are scarce. However, few U.S. studies exist and have documented negative psychological health implications work-privacy conflict compared to formal caregivers [62,64,65] and gender differences in mental health were reported [66]. However large-scale studies of double- and triple-duty caregivers of both sexes and their burnout risk are lacking.

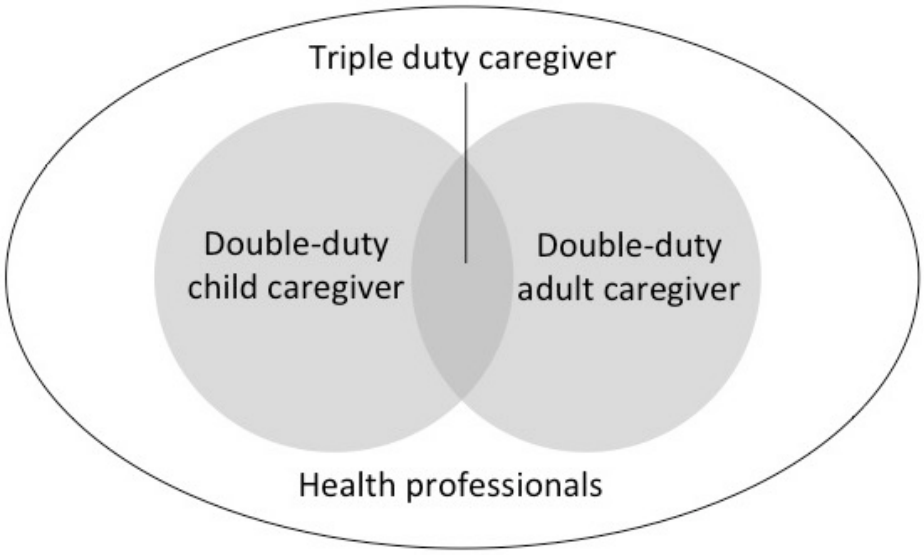

Figure 3 Classification of health professionals according to their additional caregiving responsibilities.

Occupational stress

Stress in the healthcare setting

Health professionals can be considered as a population at risk for negative health outcomes because they face various adverse working conditions. Such work stressors include high workload, long working hours, work-privacy conflict, low job control [67–69]. These result in physical and mental health problems [70] and also trigger their intention to leave the profession [68,69]. In view of a possibly under-resourced health care system in Switzerland in the future [22], it is crucial to exhaust the workforce potential in the healthcare sector. This cannot only be achieved by educating and recruiting more health professionals, but also by improving their working conditions in order to prevent health problems, which subsequently lead to early abandonment of the profession, high staff turnover and absences from work.

Burnout

Burnout is a consequence of occupational stress and results of long-lasting adverse and emotionally demanding working conditions [71]. The syndrome is characterized by physical and psychological fatigue as well as emotional exhaustion and often occurs in human service professionals including physicians, psychiatrists, nurses, teachers as well as social workers [72]. Health professionals have been found to reveal an elevated burnout risk compared to the general population and other occupations [73]. The burnout rate varies between professional groups and specialty [73–76] whereas highest burnout rates are found for nurses [74] and physicians [76].

Work-related stress models

Work-related stress models provide a theoretical framework to explain the development of occupational stress and subsequently burnout. Two widely used work-related stress models are the *effort-reward imbalance* and *work-privacy conflict*. Effort-reward imbalance supposes that

occupational stress arises from a lack of reciprocity between efforts spent and rewards received at the workplace. This imbalance of high efforts spent and low reward received generates stress and results in various adverse health effects [77]. Whereas effort-reward imbalance focuses on the causes of stress only within the working situation, work-privacy conflict locus' the causes of stress at the interface of work and private life [78]. Conceptually work-privacy conflict is a measure of work-life imbalance, stating that the experiences in the one domain affect the experiences in the other domain and can be both - positive or negative. Whereas the concept is bidirectional, work-privacy conflict measures solely stress resulting from inter-role conflicts between work and private life i.e. when the demands of work interfere with the demands of the private life [79]. This path as well as the negative spillover has been shown to be strongest in previous studies [80,81]. In contrast to other work-life or work-family balance constructs, work-privacy conflict uses the more comprehensive term privacy and hence, is not restricted to persons with a family. Both effort-reward imbalance and work-privacy conflict are predictive for burnout [76,82–86]. In theory, effort-reward imbalance as a work-specific stress measure is expected to be stronger associated with burnout than work-privacy conflict [85]. However, studies directly comparing the effect of effort-reward imbalance and work-privacy conflict on burnout found that work-privacy conflict is the stronger predictor for burnout for various occupations [84] as well as for health professionals [76]. Interestingly, work-privacy conflict was not the stronger predictor for burnout across all medical professions. Effort-reward imbalance is more important than work-privacy conflict with respect to burnout risk for physicians, therapists and medical-technical personnel suggesting that the locus of stress matters for the burnout risk for different professional groups [76]. However large studies investigating the relative influence of effort-reward imbalance and work-privacy conflict on burnout between professional groups are lacking despite its importance for targeted preventive interventions.

Outline of the thesis

As population aging demands for alternative measures to evaluate health and well-being, I use subjective measures of objective conditions to evaluate well-being. By assessing which life domains, measured as domain satisfactions, matter most for self-reported health across countries, I identify life domains in which policies to improve objective conditions have the greatest impact on subjective well-being for different national populations. Comparisons of the language areas of Switzerland with the neighboring countries offer a unique opportunity to study whether differences in the impact of life domains on self-rated health vary on a national or rather a cultural level (defined by language affiliation) (chapter II). Further, I focus on how demographic changes affect health. As the share of the population at working ages with additional caregiving responsibilities – or a combination of such – increases at least theoretically, I investigate how these situations affect health by looking at immediate effects and effects over one year for both sexes separately in a representative sample of the Swiss population (chapter III). As of health professionals' health literacy and expertise in caregiving, they are likely to take over informal caregiving roles in case the situations arises that someone in the family relies on assistance. Health professionals face various adverse working conditions and have in comparison to other professional groups an increased burnout risk. I am interested to find out whether additional informal caregiving roles affect the burnout risk of health professionals and whether this association is mediated by work-privacy conflict. In case of such mediation, I evaluate whether differences between professional groups exist in a non-representative sample of hospital employees working in six hospitals in German-speaking Switzerland (chapter IV). Professional groups within the healthcare setting all face adverse but different working conditions and it has been shown that their burnout risk differs substantially. I am interested whether effort-reward imbalance or work-privacy conflict is more predictive of the burnout risk in the hospital setting and whether the relative importance is different between professional groups (chapter V). Finally, chapter VI summarizes the main results of the papers and discusses possible implications for practice and research.

Chapter II

Which Life Domains Impact Most on Self-Rated Health? A Cross-Cultural Study of Switzerland and its Neighbors

Nadine Häusler, Oliver Hämmig, Matthias Bopp

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Chapter III

Impact of parenthood, informal caregiving and its combination on self-rated health – A population based study in Switzerland

Nadine Häusler, Oliver Hämmig, Matthias Bopp

Published in: Journal of Population Ageing. 2017 Oct 23. doi: 10.1007/s12062-017-9208-0

Chapter IV

Informal caregiving, work-privacy conflict and burnout among health professionals in Switzerland – a cross-sectional study

Nadine Häusler, Matthias Bopp, Oliver Hämmig

Accepted in Swiss Medical Weekly.

Chapter V

Effort-reward imbalance, work-privacy conflict and burnout among hospital employees

Nadine Häusler, Matthias Bopp Oliver Hämmig

Accepted in Journal of Occupational and Environmental Medicine

Chapter VI

General Discussion

In the following general discussion, the main findings of this thesis are reviewed and put in a broader context of population aging and occupational health with implications for research and practice.

Main findings

In chapter I, I highlighted the societal challenges associated with population aging and pointed out the importance of monitoring health outcomes of formal and informal caregivers in this regard.

In chapter II, we have seen that life satisfaction is strongly related to self-rated health in Switzerland and its neighboring countries and that this association is stronger in German-speaking language areas than in French/Italian-speaking areas. Whereas most domain satisfactions are significantly associated with life satisfaction as well as self-rated health, only satisfaction with one's financial situation and job satisfaction remain to have direct effects on self-rated health when adjusted for the aggregate construct life satisfaction. The effects of other domain satisfactions on self-rated health are mediated by life satisfaction. Hence, the evaluation of work and the working environment is important for health.

In chapter III and IV, I focused on informal caregivers with and without dependent children and identified a smaller share of informal caregivers with and without underage children in the Swiss population than previous studies. Although our study population in the six hospitals is not representative, we found that the share of informal caregivers with and without children is twice as large in health professionals than in the general population. Moreover, we investigated the effect of informal caregiving roles on self-rated health and burnout risk based on the theoretical background of role theory. As no dose-response effect for these relationships was evident i.e. the more roles, the worse or the better the health outcome, we had to discard the role enhancement as well as the role strain hypothesis. Our findings suggest that the individual commitment to the role is important. We identified sex differences in the relationship between caregiving and health. Whereas no negative effects of informal caregiving on health were found for women in Switzerland, negative effects were established for informal male caregivers with and without dependent children. However, their health status ameliorated over one year. Regarding health professionals providing informal care, we found

that those additionally caring for dependent children i.e. triple-duty caregivers reveal a higher burnout risk compared to health professionals without informal caregiving roles and that work-privacy conflict could not explain this relationship. Work-privacy conflict only mediated the relationship between triple-duty caregivers and burnout risk in academic staff, medical-therapeutic experts and medical-technical experts (categorized as "other health professionals").

In chapter V, we found a strong association between work-privacy conflict and burnout risk across all professional groups working in the healthcare setting. This relationship was stronger than the relationship between effort-reward imbalance and burnout risk across all professional groups. Moreover, effort-reward imbalance is only associated with burnout risk in medical tertiary educated hospital staff.

Main findings in context of population aging and occupational health

Considering the aging of the population and its consequences for pension schemes and health care provision, healthy aging is an imperative. Measuring and tracking the health status of a population is inevitable before studying and evaluating how changes in society and implemented interventions and policies affect health. Such evaluations are crucial to provide optimal conditions for healthy aging. As subjective measures of well-being and quality of life are important indicators of how a society performs [7], studies incorporating such measures should serve policymakers as evidence-based decision-making aids to achieve optimal circumstances for healthy aging. As subjective measures are valid and reliable measures when assessing different aspects of life [7], these measures should be included in regular national surveys to track the health of the population as well as to evaluate interventions and policy changes. Since the workforce is aging as well and the baby-boomers reach retirement age, a large share of the current workforce will retire within the next years and the healthcare industry will also be affected by this wave of retirees. The workforce age pyramid looks different by type of healthcare institution; the workforce in long-term care institutions is generally older than the workforce in hospitals. Hence, institutions providing long-term care will mostly be affected by the wave of retirees [22] and adequate staffing will be a challenging topic. Additionally,

early retirement is currently frequent in the healthcare industry [87]. Considering the possibly under-resourced healthcare system in Switzerland and its presumed increasing need for long-term care [22], it is essential to keep health professionals in the workforce. As individual health is essential to actively participate in the workforce, health-promoting working conditions are inevitable. Therefore, appropriate measures to increase job satisfaction and reduce work-privacy conflict need to be taken to ensure healthy workplaces and decrease the risk of developing a burnout. Hence, whereas employment and work generally enhance health, there are various negative exposures at work that can impact adversely on health.

Implications for research

Despite extensive research on the reliability and validity of subjective indicators [88], objective indicators are usually preferred over subjective ones. However, subjective indicators become more important for policymakers and subsequently for research [7]. In chapter II we have shown that only satisfaction with one's financial situation and job satisfaction have direct effects on health. Both of these domain satisfactions indicate how satisfied people are with their work and in broader terms with their occupational environment. Work on the other hand is well known to be a protective factor for health. Hence, we argue that subjective measures of work and occupational environment are valid and reliable indicators in occupational health and well-being research. Moreover, in chapter II we demonstrated that the association between domain satisfaction and self-rated health differ between countries. This implies that the results of a study evaluating the subjective relative importance of life domains for health do not necessarily hold true for a different study population and that national differences are important within this context. Additionally, studies - especially longitudinal ones - investigating the relative importance of life domains for subjective health across nations are missing. Hence, we suggest that population-based data containing subjective indicators of various life domains should be collected on a regular basis in order to monitor and evaluate long-term effects of introduced policies. Future research should focus on filling this gap.

In chapter III and IV we identified a smaller share of informal caregivers in the population compared to previous studies and highlighted earlier controversial results concerning the effect of informal caregiving on health. The different operationalization of informal caregivers and double-/triple-duty caregivers certainly pose a problem as studies are not directly comparable [27,40]. Unifying the operationalization of informal caregivers and double-and triple-duty caregivers in research is essential to gain insight into the effects and mechanisms informal caregiving roles have on the caregivers' physical and mental health. Moreover, most studies in this field are cross-sectional and rely on convenience samples. By using data from the Swiss Labor Force Survey and its national module on unpaid work, we worked with a representative sample for the Swiss population that allowed us to adjust for health at baseline. Hence, our results from chapter III are less biased than other studies in this field. However, more population-based longitudinal studies are needed to produce externally valid and unbiased evidence on the number of informal caregivers and on how caregiving affects health. Further, more behavioral-based intervention studies focusing on counseling and training of informal caregivers as well as natural experiments with care leave and respite care are needed to provide evidence on the cost-effectiveness of such policies [89,90], also in order to increase the acceptance of their public financing.

Despite evidence that persons working in the healthcare setting have an elevated burnout risk [91], most studies focused on investigating the causes of burnout for only one professional group. As professional groups in the healthcare setting face often adverse but different working conditions, we compared the burnout risk and its determinants for different professional groups and found substantial variation according to their educational attainment. Future studies can benefit from comparing professional groups differentiated for educational attainment as their working conditions and hence causes of health outcomes differ (see chapter V).

Implications for practice

In light of population aging and its resulting financial pressure on pension schemes and the healthcare system, it is essential that people stay healthy until old age in order to maintain an affordable welfare

system and to exhaust the workforce potential - especially in the health care sector. However, as more long-term care is needed due to population aging, informal care providers are needed to complement formal care. Policies ensuring that these problems are met appropriately need to be faced by the public as well as the private sector [21].

In chapter II we have shown that the overall evaluation of one's life matters most for health across all investigated countries and that most domain satisfactions contribute to general life satisfaction. Whereas for most domain satisfactions the impact on health is mediated by general life satisfaction, the influence on health remains direct for satisfaction with the financial situation and job satisfaction in several countries. We have shown that differences in the importance of life domains for health exist between countries and we did not establish a clear cultural affiliation to this respect. Therefore, public welfare policies and health promotion programs should identify important life domains for life satisfaction and health and design interventions and implement policies specifically for the important life domains with respect to health in the targeted population.

As caregiving is time and resource intensive, it often poses a psychosocial, physical and financial burden to informal caregivers and our findings from chapter III show that it can impact negatively on self-rated health. Without support, many informal caregivers reduce their working hours or quit their job [25]. Financial incentives to provide care, such as tax allowances or cash benefits, should decrease the opportunity costs to provide informal care [23,34]. Financial incentives are important, since we have seen in chapter II that satisfaction with one's financial situation has direct effects on health. Governments should also invest in support services for informal caregivers. Respite care services may ease psychosocial and health burdens. Further, counseling and training services for informal caregivers are important to increase their resources and well-being, while ensuring the quality of care for care recipients [89]. Furthermore, governments should implement legal frameworks granting informal caregivers short-term leaves from work as many European countries have such legislations [90]. Whereas public policies should focus on setting financial incentives and provide support services to informal caregivers and a legal framework for care leave, the private sector is responsible to introduce measures such as care leave and flexible work arrangements, that positively address the

compatibility of work and care responsibilities [21,92]. Our findings from chapter IV demonstrate that work-privacy conflict may explain the higher burnout risk of informal caregivers working as academic staff, medical-therapeutic or medical-technical experts. Hence, diminishing work-privacy conflicts is not only a mean to reduce adverse health outcomes such as burnout but also increase active participation in the workforce [89] at least for some informal caregivers. Further, public policies and private sector measures to increase reconciliation of work and care can decrease the opportunity costs to provide informal care [8] and indirectly alleviate the pressure on healthcare systems [89,90]. Moreover, as we have shown in chapter V work-privacy conflict is strongly associated with burnout risk in all professional groups in the healthcare setting, such measures are not only beneficial for informal caregivers, but also for decreasing the burnout risk of all healthcare workers. Even more so since a low burnout risk is associated with higher job and life satisfaction [82], which have direct effects on health as we demonstrated in chapter II. Subsequently, society as whole benefits also of preventive measures rooted the private sector through increased continuity and quality of care [73,93] as well as patients safety [94,95].

Conclusion

When putting the four studies of this PhD thesis into the context of existing literature on consequences of population aging, the results highlight the implications of multiple social responsibilities for health – especially in the healthcare sector. Our results point to adverse health implications for informal caregivers and are in line with a large share of the existing literature. However, as we did not find a dose-response relationship between caregiving roles and health outcomes, more studies are needed to disentangle the mechanisms that impact the health of informal caregivers. We suggest implementing work and care reconciliation programs for informal caregivers and employees in the healthcare sector in general in order to prevent negative health outcomes, as we found that stress resulting from conflicts between work and private life is more predictive for burnout than stress resulting within the working situation in the healthcare sector. Such interventions are not only important to avoid the reduction of working hours or the termination of a job but also with respect to patient's safety.

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Individual Contribution to papers

Paper 1 - 4

NH designed the study with input from MB and OH. NH performed the data analysis and drafted the paper. MB and OH made contributions to data interpretation and reviewed the manuscript critically. All authors read and approved the final manuscript.