

## Publikationen aus SHURP 2018/ Publications de SHURP 2018 (Swiss Nursing Homes Human Re- sources Project)

### Peer-reviewed journals

#### Association between modifiable structural and process factors and the quality indicator pain in nursing home residents: a multi-center cross-sectional survey.

Baumgartner-Violand S, Brunkert T, Cassidy S, Blatter C, Favez L, Zúñiga F. Association between modifiable structural and process factors and the quality indicator pain in nursing home residents: a multi-center cross-sectional survey. *J Adv Nurs* 2024, 0:1–15.

<https://doi.org/10.1111/jan.16567>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Aim(s):** The aim of this study is to examine the association between modifiable structural and process factors and self-reported as well as observed pain in Swiss residential long-term care residents.

**Design:** Sub-study of a multicentre cross-sectional survey.

**Methods:** Institution, unit, and staff data were collected from September 2018 to October 2019 in 118 residential long-term care institutions in Switzerland's German- and French-speaking regions using paper questionnaires. Resident data were exported during the same period from routine data sets.

**Results:** In this study, 6213 residents from 86 residential long-term care institutions were included. Modifiable structural factors such as institutions having access to geriatricians, nursing experts and a palliative care team, the presence of a pain guideline on

the unit and good teamwork among care workers were associated to less pain in residents.

**Conclusion:** It is possible for residential long-term care institutions to improve pain in residents and to optimise the quality of care by providing access to geriatricians, nursing experts and a palliative care team, working with a pain guideline and fostering teamwork.

**Implication for the Profession and/or Patient Care:** Residential long-term care institutions can modify and implement modifiable structural factors which can reduce pain in residents to optimise residents' quality of life and quality of care.

**Impact:** Improved pain management in residential long-term care institutions can lead to optimised quality of care and quality of life for individual residents.

#### Characteristics and Activities of Nurses in Expanded Roles Employed in Swiss Nursing Homes: A Cross-Sectional Study.

Saladino C, Favez L, Serdaly C, Ausserhofer D, De Geest S, Zúñiga F. Characteristics and activities of nurses in expanded roles employed in nursing homes: A cross-sectional study. *Int J Older People Nurs* 2024, 19(4):e12631.

<https://doi.org/10.1111/opn.12631>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** As the number of nursing home residents with multiple healthcare needs grows, the demand for nursing expertise increases. The implementation of new care models involving nurses with expanded roles is crucial for ensuring quality care in nursing homes.

**Aim:** To investigate the characteristics and activities of nurses employed in nursing



homes in expanded roles and the factors associated with variation in the activities performed.

**Methods:** This multicentre cross-sectional survey in Switzerland collected data from a convenience sample of 118 nursing homes between September 2018 and October 2019. From a subsample of 62 nursing homes, we analysed the characteristics and activities of 104 nurses in expanded roles. Associations between the activities performed and the educational background of the nurses in expanded roles, their direct supervisors' positions and the presence of physicians in the nursing homes were examined.

**Results:** Most Registered Nurses in expanded roles were diploma educated (48%), with fewer having a bachelor's (35%) or master's degree (17%). Overall, direct clinical practice and guidance and coaching activities were conducted monthly to weekly; consultation, evidence-based practice, collaboration and ethical decision-making activities were conducted monthly. We saw variations where a higher educational background was associated with more frequent evidence-based practice activities ( $z = 3.47$ ,  $p < 0.001$ ), and if direct supervisors were ward managers, nurses in expanded roles worked more frequently below their scope of practice ( $z = 4.10$ ,  $p < 0.001$ ).

**Conclusion:** This is the first study to use Hamric's integrative Advanced Practice Nursing model to examine the activities of nurses in expanded roles in nursing homes. We found considerable variation in their activities, where nursing homes seem to adapt their roles to their educational background and the local context.

**Implications for Practice:** Our findings show the importance of clarifying role expectations for Registered Nurses in expanded roles, allowing them to practice at the top of the licence to meet residents' complex healthcare needs.

## Exploring medication safety structures and processes in nursing homes: a cross-sectional study.

Favez L, Zúñiga F, & Meyer-Masseti C. Exploring medication safety structures and processes in nursing homes: a cross-sectional study. *Int J Clin Pharm* 2023, 45(6), 1464-1471.

<https://doi.org/10.1007/s11096-023-01625-6>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** Medication safety is important to limit adverse events for nursing home residents. Several factors, such as interprofessional collaboration with pharmacists and medication reviews, have been shown in the literature to influence medication safety processes.

**Aim:** This study had three main objectives: (1) To assess how facility- and unit-level organization and infrastructure are related to medication use processes; (2) To determine the extent of medication safety-relevant processes; and (3) To explore pharmacies' and pharmacists' involvement in nursing homes' medication-related processes.

**Method:** Cross-sectional multicenter survey data (2018-2019) from a convenience sample of 118 Swiss nursing homes were used. Data were collected on facility and unit characteristics, pharmacy services, as well as medication safety-related structures and processes. Descriptive statistics were used.

**Results:** Most of the participating nursing homes (93.2%) had electronic resident health record systems that supported medication safety in various ways (e.g., medication lists, interaction checks). Electronic data exchanges with outside partners such as pharmacies or physicians were available for fewer than half (10.2-46.3%, depending on the partner). Pharmacists collaborating with nursing homes were mainly involved

in logistical support. Medication reviews were reportedly conducted regularly in two-thirds of facilities.

**Conclusion:** A high proportion of Swiss nursing homes have implemented diverse processes and structures that support medication use and safety for residents; however, their collaboration with pharmacists remains relatively limited.

Administrative burden in Swiss nursing homes and its association with care workers' outcomes - A multicenter cross-sectional survey study

### **Administrative burden in Swiss nursing homes and its association with care workers' outcomes - A multicenter cross-sectional survey study**

Ausserhofer D, Tappeiner W, Wieser H, Serdaly C, Simon M, Zúñiga F, & Favez L. Administrative burden in Swiss nursing homes and its association with care workers' outcomes - A multicenter cross-sectional survey study. *BMC Geriatrics* 2023, 23, 347.

<https://doi.org/10.1186/s12877-023-04022-w>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** Care workers in nursing homes often perform tasks that are rather related to organizational or management activities than 'direct patient care'. 'Indirect care activities', such as documentation or other administrative tasks are often considered by care workers as a burden, as they increase overall workload and keep them away from caring for residents. So far, there is little investigation into what kind of administrative tasks are being performed in nursing homes, by which type of care workers, and to which extent, nor how administrative burden is associated with care workers' outcomes.

**Objective:** The objective of this study was to describe care workers' administrative burden in Swiss nursing homes and to explore the association with four care worker outcomes (i.e., job dissatisfaction, emotional exhaustion, intention to leave the current job and the profession).

**Methods:** This multicenter cross-sectional study used survey data from the Swiss Nursing Homes Human Resources Project 2018. It included a convenience sample of 118 nursing homes and 2'207 care workers (i.e., registered nurses, licensed practical nurses) from Switzerland's German- and French-speaking regions. Care workers completed questionnaires assessing the administrative tasks and burden, staffing and resource adequacy, leadership ability, implicit rationing of nursing care and care worker characteristics and outcomes. For the analysis, we applied generalized linear mixed models, including individual-level nurse survey data and data on unit and facility characteristics.

**Results:** Overall, 73.9% (n = 1'561) of care workers felt strongly or rather strongly burdened, with one third (36.6%, n = 787) reporting to spend 2 h or more during a "normal" day performing administrative tasks. Ratings for administrative burden ranged from 42.6% (n = 884; ordering supplies and managing stocks) to 75.3% (n = 1'621; filling out the resident's health record). One out of four care workers (25.5%, n = 561) intended to leave the profession, whereby care workers reporting higher administrative task burden (OR = 1.24; 95%CI: 1.02–1.50) were more likely to intend to leave the profession.

**Conclusion:** This study provides first insights on care workers' administrative burden in nursing homes. By limiting care workers' burdensome administrative tasks and/or shifting such tasks from higher to lower educated care workers or administrative personnel when appropriate, nursing home managers could reduce care workers'



workload and improve their job satisfaction and retention in the profession.

### Identifying work-related factors associated with work–family conflict of care workers in nursing homes: A cross-sectional study

Hauser C, Stahl J, Simon M, Valenta S, Favez L, Zúñiga F. Identifying work-related factors associated with work–family conflict of care workers in nursing homes: A cross-sectional study. *J Adv Nurs* 2023, 79(19), 3935-3945.

<https://doi.org/10.1111/jan.15704>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Aims:** To investigate which work-related factors are associated with work–family conflict of care workers in nursing homes, this study aimed to: (a) describe the prevalence of work–family conflict of care workers in nursing homes and (b) assess the association of work-related factors with work–family conflict.

**Methods:** Data were collected between September 2018 and October 2019. Work–family conflict of care workers was assessed with the Work–Family Conflict Scale (range 1–5). Prevalence was described in percentages. We used multilevel linear regression to assess the association of time-based factors (working overtime or during one's free time, employment percentage, presenteeism, shift working) and strain-based factors (staffing adequacy, leadership support) with work–family conflict.

**Results:** Our study sample consisted of 4324 care workers working in a total of 114 nursing homes. Overall, 31.2% of respondents stated to have experienced work–family conflict (>3.0 on the Work–Family Conflict Scale). The overall mean score of the study sample for work–family conflict was

2.5. Care workers experiencing presenteeism 10 or more days per year showed the highest scores for work–family conflict (mean: 3.1). All included predictor variables were significant ( $p < .05$ ).

**Conclusion:** Work–family conflict is multifactorial. Possible intervention points to tackle work–family conflict could be strengthening care workers' influence in planning work schedules, enabling flexible planning to ensure adequate staffing, lowering presenteeism and implementing a supportive leadership style.

**Impact:** Care workers' jobs become less desirable when workplace demands interfere with family life. This study highlights the multifaceted nature of work–family conflict and suggests intervention options to prevent care workers from experiencing work–family conflict. Action is needed at nursing home and policy level.

### Expanded role of nurses in Swiss nursing homes and their engagement in quality improvement: A cross-sectional study

Favez L, Simon M, Serdaly C, Zúñiga F. Expanded role of nurses in Swiss nursing homes and their engagement in quality improvement: A cross-sectional study. *Nurs Open* 2023, 10(8), 5356-5365.

<https://doi.org/10.1002/nop2.1773>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Aims:** To report on the engagement of Swiss nursing homes and of nurses in expanded roles in quality improvement.

**Methods:** Survey data from a sample of 115 Swiss nursing homes and 104 nurses in expanded roles. Descriptive statistics were used.

**Results:** Most participating nursing homes reported carrying several quality improvement activities (median of eight out of 10 activities surveyed) but some were only engaged in five activities or less. Nursing



homes working with nurses in expanded roles ( $n = 83$ ) showed greater engagement in quality improvement than those working with none. Nurses with more advanced qualifications (Bachelor's or Master's degree) engaged more in quality improvement than nurses with standard training. Specifically, higher educated nurses were more involved in data-focused activities. Using nurses in expanded roles can be a way forward for nursing homes seeking to actively carry out quality improvement in their facilities.

**Conclusion:** Although a large proportion of nurses in expanded roles surveyed were implementing quality activities, their level of engagement depended on their educational level. Our findings support the principle that higher level competencies are a key aspect of data-based quality improvement in nursing homes. However, as Advance Practice Registered Nurses will remain difficult to recruit in nursing homes, using nurses in expanded roles might contribute to quality improvement.

### Institutional Factors Associated with Residents' Malnutrition in Nursing Homes: A Cross-Sectional Study

Stahl J, Hauser C, Simon M, Valenta S, Favez L, Zúñiga F. Institutional factors associated with residents' malnutrition in nursing homes: a cross-sectional study. *J Am Med Dir Ass* 2023, S1525-8610(23)00129-9.

<https://doi.org/10.1016/j.jamda.2023.02.010>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** Malnutrition is frequent in older adults, associated with increased morbidity, mortality, and higher costs. Nursing home residents are especially affected, and evidence on institutional factors associated with malnutrition is limited. We calculated

the prevalence of malnutrition in Swiss nursing home residents and investigated which structure and process indicators of nursing homes are associated with residents' malnutrition.

**Methods:** Malnutrition was defined as a loss of bodyweight of  $\geq 5\%$  in the last 30 days or  $\geq 10\%$  in the last 180 days. Binomial generalized estimating equations (GEE) were applied to examine the association between malnutrition and structural (staffing ratio, grade mix, presence of a dietician, malnutrition guideline, support during mealtimes) and process indicators (awareness of malnutrition, food administration process). GEE models were adjusted for institutional (profit status, facility size) and specific resident characteristics.

**Results:** The prevalence of residents with malnutrition was 5%. A higher percentage of units per nursing home having a guideline on prevention and treatment of malnutrition was significantly associated with more residents with weight loss (OR 2.47, 95% CI 1.31-4.66,  $P = .005$ ). Not having a dietician in a nursing home was significantly associated with a higher rate of residents with weight loss (OR 1.60, 95% CI 1.09-2.35,  $P = .016$ ).

**Conclusions:** Having a dietician as part of a multidisciplinary team in a nursing home is an important step to address the problem of residents' malnutrition. Further research is needed to clarify the role of a guideline on prevention and treatment of malnutrition to improve the quality of care in nursing homes.

### Increasing implicit rationing of care in nursing homes: a time-series cross-sectional analysis

Renner A, Ausserhofer D, Zúñiga F, Simon M, Serdaly C, Favez L. Increasing implicit rationing of care in nursing homes: a time-series cross-sectional analysis. *Int J Nurs Stud* 2022, 134, 104320.



<https://doi.org/10.1016/j.ijnurstu.2022.104320>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** Implicit rationing of nursing care is a socio-ecological problem where care workers, due to lack of resources, have to leave necessary nursing care activities undone. Cross-sectional studies on implicit rationing of nursing home care revealed associations with organizational and work environment characteristics. However, little is known on how implicit rationing of nursing care varies over time in nursing homes.

**Objective:** This study's purpose was to describe changes in levels and patterns of implicit rationing of nursing care in Swiss nursing homes over time, while accounting for key explanatory factors related to organizational, work environment, and individual characteristics.

**Methods:** To quantify implicit rationing of nursing care, care workers' data were collected via the nursing home version of the Basel Extent of Rationing of Nursing Care instrument. To control for leadership ability, staffing and resource adequacy, we used the Nursing Work Index–Practice Environment Scale. Objective measures including turnover, staffing and skill mix levels were aggregated at the nursing home level. Our analyses included multiple linear mixed models, using time as a fixed effect and nursing home as a random effect.

**Results:** We found overall increases of rationing of care activities over the five-year period studied, with documentation and social activities most rationed at both measurement points (overall coefficients varied between 0.11 and 0.23, as well as the 95%-confidence intervals between 0.05 and 0.30). Moreover, a considerable increase in rationing of activities of daily living (coefficient of 0.47 in 2013 and 0.63 in 2018) was observed.

**Conclusions:** Alongside long-term deterioration of staff resources, increases in rationing of nursing care are a worrying development, particularly given their potential negative impacts both on residents and on care workers. To assess nursing home care quality and to determine adequate staffing levels and skill mixes, policy makers and nursing home managers should consider regular monitoring of rationing of nursing care.

### **Associations of surveillance technologies and staff attitudes with physical restraint use in nursing homes: Cross-sectional multicenter study**

Favez L, Simon M, Bleijlevens MHC, Serdaly C, Zúñiga F. Association of surveillance technology and staff opinions with physical restraint use in nursing homes: Cross-sectional study. *J Am Geriatr Soc.* 2022, 70(8), 2298-2309.

<http://doi.org/10.1111/jgs.17798>

[Laienabstract auf Deutsch](#)

[Résumé en français](#)

**Background:** Physical restraints are used in nursing homes (NHs) despite their negative consequences. Use of surveillance technologies as alternatives to physical forms of restraints and negative staff opinions about the appropriateness of restraint use have been postulated to reduce this practice; however, these have rarely been investigated alongside resident outcome data. This study aimed to measure physical restraint prevalence in Swiss NHs and its associations with a) the use of surveillance technologies and b) staff's opinion about the appropriateness of physical restraint use.

**Methods:** This cross-sectional multi-center study analyzed data on 3'137 staff and 6'149 residents of 292 units in 86 Swiss NHs (2018-2019). Based on routine resident data, we measured the prevalence of



two classes of physical restraint: a) bed-rails; or b) trunk fixation or seating option that prevent standing. To assess potential factors associated with restraint use we applied a logistic multilevel model.

**Results:** 11.1% of residents were restrained with at least one form of physical restraint. Against our hypothesis, surveillance technologies were not significantly associated with restraint use and staff members' opinion that the use of physical restraints was appropriate on their unit was associated with decreased odds of residents being restrained (OR: 0.48; 95% CI 0.29 – 0.80).

**Conclusions:** Although Swiss NHs have a low prevalence of physical restraint use, only a minority of NH units do not use any restraints with their residents. Surveillance technologies seem to be used concurrently with restraints and not as an alternative. Further research should investigate staff's current and intended uses of surveillance technologies in practice. Staff members' opinion that they use restraints inappropriately might correctly reflect overuse of restraints on their unit. If so, staff ratings of inappropriate restraint use may identify units that need improvement.

### Quality of care is what we make of it: a qualitative study of managers' perspectives on quality of care in high-performing nursing homes

Asante BL, Zúñiga F. & Favez L. Quality of care is what we make of it: a qualitative study of managers' perspectives on quality of care in high-performing nursing homes. BMC Health Serv Res 2021, 21(1), 1090. <https://doi.org/10.1186/s12913-021-07113-9>

[Laienabstract auf Deutsch](#)  
[Résumé en français](#)

**Background:** Leadership has a vital role regarding quality of care in nursing homes. However, few studies have explored upper-

level managers' views on how to assure that residents receive high quality of care. Therefore, this study's aim was to examine how managers of top-quality nursing homes define, develop and maintain high-quality of care.

**Method:** We used interpretive description, an inductive, qualitative approach. Our research included 13 semi-structured interviews with 19 managers. We analyzed their input using reflexive thematic analysis, which is an iterative approach.

**Results:** Quality development and maintenance are cyclic processes. Managers in high-performing nursing homes lead with high commitment towards a person-centred quality of care, creating appropriate working conditions and continuously co-creating a vision and the realization of quality of care together with employees.

**Conclusions:** This study confirms that, in high-performing nursing homes, a person-centered approach—one where both residents and employees are at the center—is essential for quality development and maintenance. The most effective managers exemplify “person centeredness”: they lead by example and promote quality-focused working conditions. Such strategies motivate employees to provide person-centered care. As this means focusing on residents' needs, it results in high care quality.

### Electronic Health Record Use in Swiss Nursing Homes and Its Association With Implicit Rationing of Nursing Care Documentation: Multicenter Cross-sectional Survey Study

Ausserhofer D, Favez L, Simon M, Zúñiga F. Electronic Health Record Use in Swiss Nursing Homes and Its Association With Implicit Rationing of Nursing Care Documentation: Multicenter Cross-sectional Survey Study. JMIR Med Inform 2021, 9(3):e22974

<https://doi.org/10.2196/22974>



[Laienabstract auf Deutsch](#)  
[Résumé en français](#)

**Background:** Nursing homes (NHs) are increasingly implementing electronic health records (EHRs); however, little information is available on EHR use in NH settings. It remains unclear how care workers perceive its safety, quality, and efficiency, and whether EHR use might ease the burden of documentation, thereby reducing its implicit rationing.

**Objective:** This study aims to describe nurses' perceptions regarding the usefulness of the EHR system and whether sufficient numbers of computers are available in Swiss NHs, and to explore the system's association with implicit rationing of nursing care documentation.

**Methods:** This was a multicenter cross-sectional study using survey data from the Swiss Nursing Homes Human Resources Project 2018. It includes a convenience sample of 107 NHs, 302 care units, and 1975 care workers (ie, registered nurses and licensed practical nurses) from Switzerland's German- and French-speaking regions. Care workers completed questionnaires assessing the level of implicit rationing of nursing care documentation, their perceptions of the EHR system's usefulness and of how sufficient the number of available computers was, staffing and resource adequacy, leadership ability, and teamwork and safety climate. For analysis, we applied generalized linear mixed models, including individual-level nurse survey data and data on unit and facility characteristics.

**Results:** Overall, the care workers perceived the EHR systems as useful; ratings ranged from 69.42% (1362/1962; guarantees safe care and treatment) to 78.32% (1535/1960; allows quick access to relevant information on the residents). However, less than half (914/1961, 46.61%) of the care workers reported sufficient computers on their unit to allow timely documentation.

Half of the care workers responded that they sometimes or often had to ration the documentation of care. After adjusting for work environment factors and safety and teamwork climate, both higher care worker ratings of the EHR system's usefulness ( $\beta=-.12$ ; 95% CI  $-0.17$  to  $-0.06$ ) and sufficient numbers of computers ( $\beta=-.09$ ; 95% CI  $-0.12$  to  $-0.06$ ) were consistently associated with lower implicit rationing of nursing care documentation.

**Conclusions:** Both the usefulness of the EHR system and the number of computers available were important explanatory factors for care workers leaving care activities (eg, developing or updating nursing care plans) unfinished. NH managers should carefully select and implement their information technology infrastructure with greater involvement and attention to the needs of their care workers and residents. Further research is needed to develop and implement user-friendly information technology infrastructure in NHs and to evaluate their impact on care processes as well as resident and care worker outcomes.

**SHURP 2018 Studie /  
Étude SHURP 2018**

**Schlussbericht/Rapport final**

Zúñiga F, Favez L, Baumann S, Kindlimann A, Oeri A, Benkert B, Blatter C, Renner A, Baumgartner-Violand, Serdaly C, Ausserhofer C, Mabire C & Simon M. (2021). [SHURP 2018 – Schlussbericht. Personal und Pflegequalität in Pflegeinstitutionen in der Deutschschweiz und Romandie.](#) University of Basel.

Zúñiga F, Favez L, Baumann S, Kindlimann A, Oeri A, Benkert B, Blatter C, Renner A, Baumgartner-Violand, Serdaly C, Ausserhofer C, Mabire C & Simon M. (2021). [Étude SHURP 2018 – Personnel et](#)



[qualité des soins dans les établissements médico-sociaux en Suisse alémanique et en Suisse romande.](#) University of Basel.

### **National veröffentlichte Artikel/Articles publiés au niveau national**

Favez L, Simon M, C, Zúñiga F. (2022). [Aktivitäten zur Verbesserung der Qualität in Schweizer Pflegeheimen: Eine Bestandsaufnahme](#) *NOVAcura* 53(5), 39-41.

Favez L, Saladino C, Serdaly C, Zúñiga F. (2022). [Pflegeexpert:innen in Pflegeheimen – ihr Profil und was sie machen.](#) *Krankenpflege* (11), 22-25.

Favez L, Saladino C, Serdaly C, Zúñiga F. (2022). [Profil des infirmières expertes en soins de longue durée dans les EMS.](#) *Soins infirmiers* (10), 58-61.

Favez L, Zúñiga F. (2021). [Die Situation des Personals in Alters- und Pflegeheimen.](#) *Obsan Bulletin* (05/2021). Neuchâtel: Schweizerisches Gesundheitsobservatorium.

Favez L & Zúñiga F. (2021). [La situation du personnel dans les EMS.](#) *Obsan Bulletin* (5/2021). Neuchâtel: Observatoire suisse de la santé.

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Zúñiga F & Favez L (2021). [Le personnel sous pression.](#) *FOCUS* (2/21) S. 13.

Zúñiga F, Petrig M, Ulrich M, Favez L (2021). [Infektionsprävention – lokale Expertise ist gefragt.](#) *NOVAcura* (5), 29-31.

Asante, BL, Zúñiga, F, Favez, L. (2021). [Viel Leidenschaft für die Arbeit in der Langzeitpflege.](#) *Curaviva*, 4, 38-40.

Seifer E (2021). [Die Heime stehen zunehmend unter Druck.](#) *Curaviva*, (1-2/21), 34-36.

Seifer E. (2021). [Les institutions de plus en plus sous pression.](#) *Curaviva*, 1, 23-25

### **Dissertationen/Thèse de doctorat**

Favez L. (2022). Quality Indicators and quality iMprovement PRocESSes in Swiss nursing homes (IMPRESS): a multi-study research project. (PhD thesis). University of Basel, Basel.

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