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Dementia mindset of caregivers providing residential care for older persons: study protocol for a replication study on the validation of the Dementia Mindset Scale

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ABSTRACT

Introduction Professional caregivers' perspectives on dementia and on people living with dementia (PlwD) can influence their feelings, judgements and behaviours in work situations, for example, how they think about symptoms, disease progression and the impact on a person's quality of life. Their individual dementia mindset, which can be investigated with the 12-item Dementia Mindset Scale (DMS), might influence job satisfaction, work-related well-being and person-centred care. The aim of the proposed replication study is to confirm the results of the original study of the DMS and to test whether a malleable mindset is correlated with higher levels of caregiver education, dementia-specific professional experience/competence and dementia knowledge.

Methods and analysis Professional caregivers in residential care facilities for older persons who work directly with PlwD will be asked to answer an anonymous web-based online survey. The survey encompasses five standardised questionnaires: the DMS, the Dementia Knowledge Assessment Scale, the Oldenburg Burnout Inventory, the Job-related Affective Well-being Scale and the Sense of Competence in Dementia Care Staff Scale. In addition, job satisfaction, the educational background, professional experience and work situation are surveyed. For replication, the analyses will re-evaluate the psychometric properties (structural validity, model fit, internal consistency and predictive validity) by applying descriptive statistics, regression analysis, confirmatory factor analysis and correlation analysis. The additional analyses will use descriptive statistics, regression analysis and correlation analysis. Rasch analysis will be used to rank the difficulty of the items.

Ethics and dissemination This study was approved by the ethics committee of the German Society of Nursing Science (ID number 23-004). No personal information will be gathered. The results of the study will be distributed nationally and internationally through peer-reviewed academic journals, conferences, institutional websites and journals for nursing care practice.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The sample will be recruited from different facilities, so the data are not associated with specific organisational-level characteristics, such as work atmosphere, management or working conditions and will, therefore, provide a variety of responses.
⇒ The survey is anonymous to protect participants and to reduce socially desirable response behaviour.
⇒ The sample is a convenience sample and the data may, therefore, not be representative of the study population (professional caregivers in residential care in Germany), but we will control this by matching the data with official statistics on nursing staff (https://www.destatis.de).
⇒ Due to the anonymous character of the survey, it is not possible to control for organisation-level variables.
⇒ Due to the anonymous character of the survey, it is not possible to prevent multiple completions by one person.

INTRODUCTION

The particular caregiving-related demands for people living with dementia (PlwD) increase the risk for adverse effects on the health and well-being of professional caregivers.[1] Considering this challenge, Kunz *et al*.[2] sought to determine 'why some care professionals are able to maintain well-being and thrive at work while others struggle in this regard'. They identified job-related well-being as a particularly important outcome because of its relationships with job performance,[3] turnover intentions,[4] absenteeism[5] and affective organisational commitment.[6] Based on the concept of mindsets or implicit theories formulated by Dweck and Leggett[7] and Dweck *et al*.[8], Kunz *et al*. assumed that how care professionals think about dementia (in terms of their 'dementia

mindset') might have an influence on dementia care and on important caregiver outcomes. Further, they assumed that understanding the dementia mindsets of care professionals might help to explain differences in the experience of care professionals between individuals.[2]

According to the concept of mindsets,[7 8] people have different implicit theories (mindsets) about how fixed or flexible human characteristics are. A distinction is made between a fixed mindset and a malleable mindset. People with a fixed mindset perceive attributes as invariable and unchangeable, whereas people with a malleable mindset perceive attributes as flexible and changeable. Mindsets are domain-specific, that is, a mindset regarding one trait (eg, intelligence), bundles the person's perception of the stability of this trait, whereas other traits may be evaluated differently at the same time. Mindsets affect not only judgements but also emotional reactions and behaviour. '(I)n the face of challenges or setbacks, a fixed mindset leads to quick, global trait judgements as reasons for negative outcomes, which induce helpless responses (eg, depression, diminished motivation, and lower self-efficacy)[9] (…). In contrast, (…) a malleable mindset induces a mastery orientation and fosters motivation[8] because it engenders a focus on factors or strategies that can affect a particular outcome'.[2]

Kunz *et al*.[2] built on this research suggesting that mindsets can have significant effects on human function, for example, memory performance,[10] mental health,[11] weight loss,[12] academic success,[13] work performance,[14] affective well-being and life satisfaction,[15] depression[16] and future psychological distress.[17] Having a fixed mindset was generally more detrimental to well-being than having a malleable mindset.[7 18] They translated the idea of mindsets into the context of dementia-specific care and developed a standardised survey instrument to measure the dementia-related mindset of professional caregivers. The Dementia Mindset Scale (DMS) measures the extent to which professional caregivers view dementia as invariable and fixed (ie, the caregiver has a fixed dementia mindset) or as flexible and malleable (ie, the caregiver has a malleable dementia mindset). The authors defined a fixed dementia mindset as 'the belief that the expression and progression of dementia symptoms, and how the expression and progression of dementia symptoms impact on that person's quality of life are attributes that cannot be influenced by the external (social or physical) context'. They defined a malleable dementia mindset as 'the belief that the expression and progression of dementia symptoms, and how the expression and progression of dementia symptoms impact that person's quality of life are attributes that can be influenced by the external (social or physical) context'.[2] Kunz *et al*.[2] assumed that a fixed dementia mindset stems from a biomedical view of dementia[19] and would result in helpless behaviour in challenging situations. They expected 'that a fixed dementia mindset would negatively predict well-being, as changes in dementia symptoms and its effects are perceived to occur mainly as a result of pharmacological interventions, whereas the behavioural effort of care professionals is deemed irrelevant. Therefore, individuals with a fixed dementia mindset may feel less hopeful and optimistic and thus less well, satisfied and confident and more burned out in their own competence in dementia care'.[2] In contrast, a malleable dementia mindset reflects a person-centred perspective on dementia[20] and, in a challenging situation, would lead to an evaluation of potential interventions focused on meeting the needs of the person with dementia. They expected that 'a malleable dementia mindset would foster the belief in care professionals that dementia and its effects on the person can be influenced. This underlying belief may result in hope and optimism, both of which are affective states that are positive in nature and may increase feelings of well-being,[21] job satisfaction[22] and level of engagement at work.[23] It may also facilitate confidence in one's own competence in dementia care[24] and the belief that one is able to deal with emerging stressors at work.[25 2]

The development of the DMS was pursued in four studies with current and prospective care professionals in Germany.[2] It comprised the generation of items and content adequacy (study 1; n=16 participants), testing items for comprehensibility (study 2; n=11), assessing the exploratory factorial structure and psychometric properties of the scale (study 3; n=203), and investigating its predictive validity for care professionals' well-being and confirmatory factorial structure (study 4; n=204).

In this study, we plan to systematically replicate[26] the measurement instruments and analyses from study 4. A deliberate difference from the study by Kunz *et al*.[2] will be in the selection of the sample or target group. The previous study surveyed a mixed sample of registered nurses, therapeutic and recreational staff, social workers and individuals working in administrative or management positions. The current study intends to survey nurses and nursing assistants in licensed nursing homes with a supply contract to strengthen the level of evidence, especially in this target population. The definition of German nursing homes is in line with the international definition by Sanford *et al*.: 'A nursing home is a facility with a domestic-styled environment that provides 24-hour functional support and care for persons who require assistance with ADLs and who often have complex health needs and increased vulnerability'.[27]

The rationale for this study is to confirm the results of the DMS and to test the sensitivity of the instrument. The instrument should be suitable for identifying caregivers with different dementia mindsets. On this basis, it should be possible to align trainings or interventions with existing mindsets in the nursing team, to measure the influence of the dementia mindset on the effectiveness and implementation of trainings or interventions and possibly develop interventions that target the dementia mindset of professional caregivers.

Aims and research questions

This replication study aims to confirm the results of the original study 4 by Kunz *et al*.[2] regarding model fit, internal consistency and predictive validity. Furthermore, it aims to test whether a malleable mindset is associated with a higher level of professional caregivers' education, higher dementia-specific professional experience/competence among professional caregivers and higher dementia knowledge among professional caregivers.

The research questions are as follows:

- Which structural model fits our data?
- Does the two-factor structure model described in Kunz *et al*.[2] also fit in our sample?
- Does the present 12-item scale show internal consistency (reliability)?
- Does the present 12-item scale show predictive validity with the external criterion 'work-related well-being'?

As an extension of the replication, the current study addresses the following additional questions:

- What thresholds (cut-off points) are appropriate for assigning professional caregivers to a specific mindset?
- What is the prevalence of the two different dementia mindsets among professional caregivers?
- Is a malleable dementia mindset positively associated with a higher level of education among professional caregivers?
- Is a malleable dementia mindset positively associated with higher dementia-specific professional experience/competence among professional caregivers?
- Is a malleable dementia mindset positively associated with higher dementia knowledge among professional caregivers?

METHODS AND ANALYSIS

Design and sample

The study is designed as a systematic replication[28] of the original study (part 4) by Kunz *et al*.[2] The replication varies in data collection method to achieve a larger sample size with a primary focus on care professionals in nursing homes. In addition, we expanded the original questionnaire to include an instrument (Dementia Knowledge Assessment Scale (DKASg))[29] to assess dementia knowledge, one item on personal experience with dementia and further sociodemographic items.

The study is scheduled to run from March 2023 to July 2024. The sample will consist of professional caregivers (nurses and nursing assistants), regardless of the level of education or hierarchy, working in residential care facilities for older persons who have direct contact with PlwD in their work.

We opted for an anonymous web survey with primarily direct field access in order to achieve a high response rate, to prevent participants from negative effects and to exclude adverse reactions (eg, evaluation apprehension) as far as possible.[28 30] For direct field access, we decided to distribute the call for the survey widely via social media platforms (eg, Facebook, Instagram and X), where the DZNE has contact with caregivers in relevant groups and influencers. If we do not reach our sample size in this way, we would make gradual adjustments for further field access. For this, we would use professional mailing lists to address (a) cooperation partners in the field and (b) management levels of nursing homes in Germany with the request to advertise participation in the study among the nursing staff.

To validate the questionnaire, we used the a priori definition for the necessary subjects to items and the formula proposed by Fleiss *et al*.[31] to access the needed sample size. With the 12 items, an alpha level of 5%, a power of 80% and an expected reliability value (Cronbach's alpha) of at least 0.70 (Cronbach's alpha was 0.80 in the reference study), a total of n=107 participants are needed. For a power of 90%, n=142 participants would be needed if we only have chosen to base our sample size using this method.

In addition, we calculated the size of a representative sample because our aim is to estimate the prevalence of the two different dementia mindsets among professional caregivers, knowing that we will only achieve a convenience sample for methodological (eg, limited access to nursing staff) and ethical reasons (eg, voluntary participation). Nevertheless, we are aiming to give every member of the target group the opportunity to take part in the survey by conducting an online survey that is distributed nationwide. For the purpose of quality evaluation, we will control our sample by matching the data with official statistics on nursing staff (https://www.destatis.de). For the calculation of a representative sample (see table 1), we use Jacobs *et al*. who reported the number of professional caregivers in inpatient geriatric care in Germany to be 421 287 persons in 2020.[32] This number is used as the target population. The calculations were performed by using the R software.[33]

With the usual values of 95% CI, 5% error and 50% prevalence, a total of n=384 participants would need to be recruited. This number of cases corresponds to our target sample size and thus exceeds the minimum sample requirements relevant for questionnaire validation (Cronbach's alpha). The basic statistical assumption of equally distributed access possibilities of the target population is invalid, strictly speaking. Based on our recruitment options, it can be assumed that the potential number of participants is significantly smaller than the target

Table 1 Sample size calculation for representativeness

CI	Sample size
80%	164
90%	270
95%	384
98%	540
99%	662

With the usual values of 95% CI, 5% error and 50% prevalence, a total of n=384 participants would need to be recruited.

population. Since the informative value of the study has the highest priority, we calculated generously to arrive at 384 participants.

Data collection and instruments

Data collection will take the form of a web-based online survey.[34] For this purpose, the survey software LimeSurvey hosted by the DZNE will be used. A structured individual survey with standardised questionnaires will be conducted. Participants will be informed that participation is voluntary and anonymous. No personal identifying data will be gathered. They will receive information about the intention of the study and instructions for completion of the survey. The data collection is planned from May 2023 to 31 December 2023. The data collection may be extended beyond this date in order to reach the target sample.

The survey entails the German versions of the following instruments:

Dementia mindset: DMS

The DMS consists of 12 items. Six items measure a malleable dementia mindset, and six items measure a fixed dementia mindset. Rating is on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). For each domain (malleable and fixed), a mean score will be calculated.[2]

Burn-out: Oldenburg Burnout Inventory

The Oldenburg Burnout Inventory is a tested instrument to measure two main dimensions of burn-out: exhaustion and disengagement from work. The instrument includes 16 items in total, with eight positively and eight negatively worded items. The answer categories for each item are measured on a 4-point scale from 1 (strongly agree) to 4 (strongly disagree). The score for each subscale will be calculated by summing up the related questions. Both subscales are summed up for the total score (16–64 points).[35]

Job-related affective well-being: 20-item Job-related Affective Well-being Scale

The 20-item (short version) scale is designed to assess people's emotional experiences at work. Every item represents one emotion (either negative or positive). Respondents rate how often they have experienced each emotion at work over the prior 30 days on a 5-point scale (never, rarely, sometimes, quite often and extremely often/always). A total score (20–100 points) will be calculated by summing up all 20 items.[36]

Subjective sense of competence in caring for PlwD: Sense of Competence in Dementia Care Staff Scale

The Sense of Competence in Dementia Care Staff is an instrument measuring the sense of caregiving competence in professional caregivers. The 17-item questionnaire instrument comprises four subscales (professionalism, building relationships, care challenges and sustaining personhood). The answer categories for each item are measured on a 4-point scale from 1 (not at all) to 4 (very much). A total score (17–68 points) will be calculated by summing up all items. Higher scores indicate a greater sense of competence.[24]

Dementia knowledge: DKASg

In the 25-item DKASg scale, participants are asked to read and respond to statements about dementia that are factually correct or incorrect. There are five response options (false, likely false, likely true, true and do not know), which will be recorded into scoring points (0–2) for a correct answer. The scoring points will be summed up to calculate a total score (0–50 points). A higher value indicates greater knowledge about the dementia syndrome. The DKAS has been proven to be a reliable and valid measure of the dementia knowledge of different health professionals.[29]

Job satisfaction will be assessed with the item 'Please indicate how satisfied you were at work within the last 4 weeks' (1=very unsatisfied and 7=very satisfied).[2] Moreover, we will gather single sociodemographic items (including education), professional background and personal experience in the care of relatives or close friends with dementia.

Data analysis

The data will be described using descriptive statistical analyses. This includes information on the frequency distribution (eg, absolute and relative frequencies) of the individual questionnaire items as well as evaluations analysed using measures of location and dispersion. In addition, correlations between dementia mindsets and other constructs, such as 'dementia knowledge', 'job satisfaction' and 'affective well-being', as well as sociodemographic data (see table 2), will be analysed.

The analyses planned in this study replicate the analyses in study 4, except for those of situation-specific positive and negative emotions. The emotional responses to work situations were assessed with a situational judgement test, which requires considerable time for participants to respond. Further, care professionals indicated their emotional responses to care situations based on four different emotional reactions (delighted, calm, annoyed and depressed), which does not represent a validated instrument to measure emotional responses. A comparison of the descriptive statistics of the individual instruments with those in Kunz *et al*.[2] is intended but is not listed separately in table 2 for reasons of conciseness. In addition, a set of analyses will be performed that extend the replication. Both the methods used by Kunz *et al*.[2] and the additional methods correspond to the recommendations of the COSMIN (Consensus-based Standards for the selection of health Measurement INstruments) guideline.[37] This guideline also provides criteria (threshold values) for 'good' measurement properties regarding the methods (CFA, Rasch and Cronbach's alpha), which we take into account for the interpretation of the results.

Table 2 Measurements, planned analyses and assumptions

Measurements	Statistics and quality criteria	Assumptions
Sociodemographic and context data: ► Age ► Gender ► Tenure	Sample description: External validity Representativeness of professional caregiver in residential long-term care.[46] Regression analysis: Control variables (age, gender, tenure)	Research team: We aim to have a sample that is representative of our target population (the sample group must represent the population as a whole) in the variables of age, gender, work experience, etc. For this purpose, we will use the information on the population from 'Gesundheit Statistik Gesundheitsberichterstattung des Bundes' (https://www.destatis.de). Deviations that may occur will be reported.
(+) ► Education level ► Leadership responsibility ► Setting ► Job scope ► Work experience		(+) Research team: We assume the following correlation: A malleable dementia mindset shows a positive correlation with a higher level of education among professional caregivers.
(+) Personal experience in the care of relatives or close friends with dementia (yes/no).	(+) Correlation analyses: Point biserial correlation	(+) Research team: We assume the following correlation: Personal experience shows a positive correlation with a malleable dementia mindset.
Dementia Mindset Scale[2] Malleable and Fixed Mindset	Construct validity: Confirmatory factor analysis[47] Model: Two-factor structure If the two-factor model doesn't fit an exploratory model will be applied.	Decision for construct validity based on Kunz *et al.*[2]: Model: Two-factor structure (χ^2=100.793, df=53, p<0.001, GFI=0.920, CFI=0.906, RMSEA=0.067) statistically significantly different from the one-factor model that fit the data less well. The two factors were negatively correlated with each other (r=−0.38***). Cronbach's alphas were 0.77 for the fixed Dementia Mindset Scale and 0.73 for the malleable Dementia Mindset Scale
	Correlation analyses and internal consistency: Cronbach's alpha, point biserial correlation, product-moment correlation	
	(+) Rasch validity of scales: The assumptions of the Rasch model,[38 48] that is, unidimensionality (malleable and fixed dementia mindset), local stochastic independence, specific objectivity, sufficient statistics and equal discriminatory power, are tested. Identify thresholds (cut-off points) which are appropriate for assigning professional caregivers to a specific mindset.	(+) Rasch validity of scales: The essential conditions for the summation of the dementia mindset scales are satisfied.
	(+) Estimation of prevalence: An estimate is sought for the prevalence of the dementia mindsets. Proportion and CIs	(+) Research team: As we have no prior knowledge of the prevalence for the target population, we estimated the mindset distribution at 50:50 (see sample size calculation)

Continued

Table 2 Continued

Measurements	Statistics and quality criteria	Assumptions
(+) The Dementia Knowledge Assessment Scale[29]	**(+)** Regression analyses: Independent variables (malleable and fixed dementia mindsets) Control variables (age, gender, tenure)	**(+)** Research team: We hypothesise that a malleable dementia mindset will make a positive explanatory contribution to knowledge of dementia disease Malleable Fixed
	(+) Correlation analyses: Point biserial correlation, product-moment correlation	
Oldenburg Burnout Inventory (OLBI)[35] OLBI—disengagement OLBI—exhaustion	Regression analyses: Independent variables (malleable and fixed dementia mindsets) Control variables (age, gender, tenure)	OLBI—disengagement Malleable (Beta=–0.18**) Fixed (non-significant)
	Correlation analyses: Point biserial correlation, product-moment correlation OLBI—disengagement[2]:	OLBI—exhaustion[2]: Malleable (non-significant) Fixed (non-significant)
Job-Related Affective Well-Being Scale (JAWS)[36]	Regression analyses: Independent variables (malleable and fixed dementia mindsets) Control variables (age, gender, tenure)	JAWS[2]: Malleable (non-significant) Fixed (non-significant)
	Correlation analyses: point biserial correlation, product-moment correlation	
Job satisfaction[2]	Regression analyses: Independent variables (malleable and fixed dementia mindsets) Control variables (age, gender, tenure)	Job satisfaction[2]: Malleable (non-significant) Fixed (non-significant)
	Correlation analyses: point biserial correlation, product-moment correlation	
Sense of Competence in Dementia Care Staff (SCIDS) scale[24]	Regression analyses: Independent variables (malleable and fixed dementia mindsets) Control variables (age, gender, tenure)	SCIDS[2]: Malleable (beta=0.17*) Fixed (non-significant)
	Correlation analyses: Point biserial correlation, product-moment correlation	

(+) additional measurement, analyses and assumptions based on considerations of the research team.
*p<0.10, **p<0.05, ***p<0.01.
CFI (Comperative Fit Index), GFI (Goodness of Fit Index), RMSEA (Root Mean Square Error of Approximation)

Additionally, Andersen's likelihood ratio test[38] will be used to test whether a Rasch model fits the data.

Table 2 presents the measurements, the planned analyses and our prior assumptions, which are primarily based on the study by Kunz *et al*.[2] The quality criteria, the associated statistical test procedures and the software solution are listed.

To re-evaluate the scale, following the study of Kunz *et al*.,[2] model fit, internal consistency and predictive validity will be determined. To determine predictive validity, the predictive power of the dementia mindset on work-related well-being among professional caregivers will be examined.

Patient and public involvement

Patients, the public or nursing staff will not be involved in the study in terms of patient and public involvement. Members of the study team have professional experience as nurses or with working in nursing homes. In addition, the topic of dementia mindsets and the details of the study are discussed with professionals working in nursing homes at a conference on dementia mindsets that we are hosting.

ETHICS AND DISSEMINATION

The ethics committee of the German Society of Nursing Science (registered association) approved this study on 31 March 2023 (ID number: 23-004). The study will be carried out in compliance with research ethics principles.[39] No personal data will be gathered; the survey will be conducted anonymously. Sociodemographic information is requested in aggregated form (eg, age groups) to ensure that participants will not be identifiable.

During recruitment, participants receive written information. Detailed information will be provided prior to the survey commencement. Participants will be informed that their willingness to voluntarily participate in the anonymous survey is indicated by actively starting the survey (implied informed consent).[40] Participants will be able to withdraw from the survey at any time without incurring any negative consequences. Participants will not be reimbursed for their participation.

All data will be stored at the DZNE site Witten and can be requested by contacting data-management-witten(at)dzne.de.

The results of this study will be primarily published in peer-reviewed open-access academic journals and presented at national and international conferences. In addition, we plan to publish the results on the DZNE website and in a journal addressing professional caregivers, that is, the study population.

DISCUSSION

The planned study will provide data to confirm the validity and reliability of this new scale. The replication may strengthen the evidence of the DMS and may provide the basis for its increased use in different research studies. The extension of the replication will add more knowledge about the quality of the DMS by testing the assumptions of the Rasch[41] model (unidimensionality, local stochastic independence, specific objectivity, sufficient statistics and equal discriminatory power). The aim is to investigate whether threshold values can be determined based on item difficulty in order to assign professional caregivers to a specific dementia mindset. Furthermore, we will gather the first data regarding the prevalence of both mindsets, malleable and fixed, in the population of nurses and nursing assistants working in German nursing homes. In addition, the results of this study will help to understand the relationships between dementia mindset and other constructs (see table 2) that are relevant in professional dementia care and corresponding research.

As an extension of the replication, we will include measures for education, experience and knowledge. The rationale behind this is that experience and knowledge, gained from education and from real situations, facilitate professional caregivers' ability to handle care situations and to adequately care for PlwD, for example, to deliver person-centred care.[42] Therefore, we will include education level not only as sociodemographic information but also as an independent variable, assuming that a malleable dementia mindset shows a positive correlation with a higher level of education among professional caregivers. Furthermore, we will include personal experience in the care of relatives or close friends with dementia as an independent variable. We assume that personal experience shows a positive correlation with a malleable dementia mindset. Personal experience means that one has already interacted intensively and on a personal (not: professional) level with a person living with dementia. In this interaction, one might have experienced the possibilities of influencing the situation of PlwD, even in later phases of the disease. In addition, we will include the concept of dementia knowledge because we hypothesise that a malleable dementia mindset will make a positive explanatory contribution to knowledge of dementia disease.

Data will be collected through an anonymous web survey. The idea is to increase the response rate and to reduce the likelihood of socially desirable responses, which might be encouraged by the questionnaires used, including the DMS. This means, however, that it is neither possible to prevent multiple completions by one person nor to control for organisation-level variables. The sample will be recruited from different facilities that might be characterised by varying features, such as organisational culture. Consequently, the data are not affected by the features of one specific organisation, and therefore, will provide variance of responses. However, individual mindsets could also be influenced by the organisational culture of the nursing home, work atmosphere, management or working conditions.[43] Due to the anticipated difficulty of reaching the target population, we decided to collect a convenience sample. We aim at the participant

group of nurses and nursing assistants in residential care. However, participation of nurses working in other settings or from nursing home staff not directly involved in care is possible. In the survey, we will collect data on the profession, current occupation and workplace setting of the participants. Based on this information, we will be able to include only the relevant study population in the analysis. For recruitment, we use different strategies, for example, social media, mailing lists and professional research networks; therefore, the data may not be representative of care professionals in German nursing homes, but we will control this by matching the data with official statistics.

In the future, the DMS might be useful for identifying staff training opportunities, preparing tailored interventions that target care professionals' behaviour in care situations and evaluating the effectiveness of interventions that target care professionals' mindsets. The dementia mindset of care professionals was reported to be able to predict job-related well-being, and a malleable mindset was associated with lower levels of disengagement (burn-out) and a higher sense of competence.[2] A fixed dementia mindset was negatively associated with reported person-centred care,[44] which is of the highest relevance in dementia care.

In the context of nursing homes, dementia care and concepts such as person-centred dementia care are playing an increasing role, as PlwD represent the majority of nursing home residents.[45] The goal of person-centred dementia care is to maintain personhood by supporting people's autonomy, fostering and maintaining relationships and satisfying psychosocial needs.[20] These goals are related to the mindset of professional caregivers. For example, in the case of a malleable dementia mindset, professional caregivers may believe that the impact or progression of dementia symptoms can be reduced or slowed through meaningful interactions and activities. Based on this belief, professional caregivers might adapt their behaviour towards PlwD. Kunz *et al*.[44] did not find their hypothesis that a malleable dementia mindset positively predicts reported person-centred care to be supported. However, they found that a fixed dementia mindset negatively predicted reported person-centred care. In addition, positive emotional responses to care situations were identified as facilitators of person-centred care.

Influencing the dementia mindset of care professionals, for example, through training, might also benefit the effectiveness and implementation of person-centred interventions. In addition, established training programmes for person-centred care might benefit from the inclusion of mindset sensitivity. Thus, a better understanding of the dementia mindset construct and strengthened evidence of the DMS can help to prevent care professionals' attrition and can contribute to the future implementation of person-centred dementia care.

Contributors BA, JMB, RM-W, AH, CP, NB, DRR and ST conceptualised the study. BA, JMB and ST prepared the initial draft of the manuscript equally. BA coordinates the project. LKK consults the study team. DRR and JMB are responsible for the statistical methods and instruments. RM-W is responsible for the technical realisation (eg, data collection) and data management. ST supervises all steps of the project and is the guarantor. All the authors have read and approved the final manuscript.

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REFERENCES

1 Schulz R, O'Brien AT, Bookwala J, *et al*. Psychiatric and physical morbidity effects of dementia caregiving: prevalence, correlates, and causes. *Gerontologist* 1995;35:771–91.
2 Kunz LK, Scheibe S, Wisse B, *et al*. Dementia as fixed or malleable: development and validation of the dementia mindset scale. *Innov Aging* 2020;4:igaa023.
3 Judge TA, Thoresen CJ, Bono JE, *et al*. The job satisfaction-job performance relationship: a qualitative and quantitative review. *Psychol Bull* 2001;127:376–407.
4 Brunetto Y, Xerri M, Shriberg A, *et al*. The impact of workplace relationships on engagement, well-being, commitment and turnover for nurses in Australia and the USA. *J Adv Nurs* 2013;69:2786–99.
5 Davey MM, Cummings G, Newburn-Cook CV, *et al*. Predictors of nurse absenteeism in hospitals: a systematic review. *J Nurs Manag* 2009;17:312–30.
6 Meyer JP, Maltin ER. Employee commitment and well-being: A critical review, theoretical framework and research agenda. *J Vocat Behav* 2010;77:323–37.
7 Dweck CS, Leggett EL. A social-cognitive approach to motivation and personality. *Psychol Rev* 1988;95:256–73.
8 Dweck CS, Chiu C, Hong Y. Implicit theories and their role in judgments and reactions: a word from two perspectives. *Psychol Inq* 1995;6:267–85.
9 Robins RW, Pals JL. Implicit self-theories in the academic domain: implications for goal orientation, attributions, affect, and self-esteem change. *S I* 2002;1:313–36.
10 Plaks JE, Chasteen AL. Entity versus incremental theories predict older adults' memory performance. *Psychol Aging* 2013;28:948–57.
11 Schroder HS, Dawood S, Yalch MM, *et al*. Evaluating the domain specificity of mental health–related mind-sets. *Soc Psychol Personal Sci* 2016;7:508–20.
12 Burnette JL, Hoyt CL, Orvidas K. Mindsets of body weight. In: Zedelius CM, Müller BCN, Schooler JW, eds. *The science of lay theories*. Cham: Springer International Publishing, 2017: 319–39.
13 Ortiz Alvarado NB, Rodríguez Ontiveros M, Ayala Gaytán EA. Do mindsets shape students' well-being and performance? *J Psychol* 2019;153:843–59.
14 Zingoni M, Corey CM. How mindset matters: the direct and indirect effects of employees' mindsets on job performance. *J Pers Psychol* 2017;16:36–45.

15 King RB. A fixed mindset leads to negative affect: the relations between implicit theories of intelligence and subjective well-being. *Z Psychol* 2017;225:137–45.
16 Ford BQ, Lwi SJ, Gentzler AL, *et al*. The cost of believing emotions are uncontrollable: Youths' beliefs about emotion predict emotion regulation and depressive symptoms. *J Exp Psychol Gen* 2018;147:1170–90.
17 Schroder HS, Callahan CP, Gornik AE, *et al*. The fixed mindset of anxiety predicts future distress: a longitudinal study. *Behav Ther* 2019;50:710–7.
18 Van Tongeren DR, Burnette JL. Do you believe happiness can change? An investigation of the relationship between happiness mindsets, well-being, and satisfaction. *J Posit Psychol* 2018;13:101–9.
19 Lyman KA. Bringing the social back in: a critique of the biomedicalization of dementia. *Gerontologist* 1989;29:597–605.
20 Kitwood T. The concept of personhood and its relevance for a new culture of dementia care. In: Jones G, Miesen B, eds. *Care-giving in dementia*. Routledge, 1997: 3–13.
21 Scheier MF, Carver CS. Effects of optimism on psychological and physical well-being: Theoretical overview and empirical update. *Cogn Ther Res* 1992;16:201–28.
22 Duggleby W, Cooper D, Penz K. Hope, self-efficacy, spiritual well-being and job satisfaction. *J Adv Nurs* 2009;65:2376–85.
23 Kahn WA. Psychological conditions of personal engagement and disengagement at work. *AMJ* 1990;33:692–724.
24 Schepers AK, Orrell M, Shanahan N, *et al*. Sense of competence in dementia care staff (SCIDS) scale: development, reliability, and validity. *Int Psychogeriatr* 2012;24:1153–62.
25 Chana N, Kennedy P, Chessell ZJ. Nursing staffs' emotional well-being and caring behaviours. *J Clin Nurs* 2015;24:2835–48.
26 Crandall CS, Sherman JW. On the scientific superiority of conceptual replications for scientific progress. *J Exp Soc Psychol* 2016;66:93–9.
27 Sanford AM, Orrell M, Tolson D, *et al*. An international definition for "nursing home" *J Am Med Dir Assoc* 2015;16:181–4.
28 Döring N, Bortz J, Pöschl-Günther S. *Forschungsmethoden Und Evaluation in Den Sozial-Und Humanwissenschaften*. 5th edn. Berlin; Heidelberg: Springer, 2016.
29 Annear MJ, Toye C, Elliott K-EJ, *et al*. Dementia knowledge assessment scale (DKAS): confirmatory factor analysis and comparative subscale scores among an international cohort. *BMC Geriatr* 2017;17:168.
30 Waltz CF, Strickland OL, Lenz ER. *Measurement in nursing and health research*. 4th edn. New York: Springer, 2010.
31 Fleiss JL, Levin B, Paik MC. *Statistical methods for rates and proportions*. 2nd edn. New York: Wiley, 1981.
32 Jacobs K, Kuhlmey A, Greß S, *et al*. Mehr personal in der langzeitpflege – aber woher. In: Jacobs K, Kuhlmey A, Greß S, *et al*., eds. *Pflege-report 2019*. 2019.
33 R Core Team. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, 2024. Available: https://www.R-project.org/
34 Schnell R, Hill PB, Esser E. *Methoden Der Empirischen Sozialforschung*. Berlin; Boston: De Gruyter Oldenbourg, 2018.
35 Demerouti E, Nachreiner F. n.d. Zur Spezifität von Burnout für Dienstleistungsberufe: Fakt oder Artefakt. *Z Arbeitswiss*1998:82–9.
36 Van Katwyk PT, Fox S, Spector PE, *et al*. Using the job-related affective well-being scale (JAWS) to investigate affective responses to work stressors. *J Occup Health Psychol* 2000;5:219–30.
37 Prinsen CAC, Mokkink LB, Bouter LM, *et al*. COSMIN guideline for systematic reviews of patient-reported outcome measures. *Qual Life Res* 2018;27:1147–57.
38 Andersen EB. A goodness of fit test for the rasch model. *Psychometrika* 1973;38:123–40.
39 Schnell MW, Dunger C. *Forschungsethik: Informieren - Reflektieren - Anwenden. 2., Vollständig Überarbeitete Und Erweiterte Auflage Ed*. Bern: Hogrefe, 2018.
40 Oates J, Carpenter D, Fisher M. BPS code of human research ethics. 2021. Available: https://explore.bps.org.uk/lookup/doi/10.53841/bpsrep.2021.inf180
41 Rasch G. *Probabilistic models for some intelligence and attainment tests*. Chicago: University of Chicago Press 1980.
42 Brossard Saxell T, Ingvert M, Lethin C. Facilitators for person-centred care of inpatients with dementia: A meta-synthesis of registered nurses' experiences. *Dementia (London)* 2021;20:188–212.
43 Murphy MC, Reeves SL. Personal and organizational mindsets at work. *Res Organ Behav* 2019;39:100121.
44 Kunz LK, Scheibe S, Wisse B, *et al*. From dementia mindsets to emotions and behaviors: Predicting person-centered care in care professionals. *Dementia (London)* 2022;21:1618–35.
45 Hoffmann F, Kaduszkiewicz H, Glaeske G, *et al*. Prevalence of dementia in nursing home and community-dwelling older adults in Germany. *Aging Clin Exp Res* 2014;26:555–9.
46 Wickham H, Chang W, Wickham MH. Package 'ggplot2'. Create elegant data visualisations using the grammar of graphics Version. 2016;2:1–189.
47 Rosseel Y. lavaan: an R package for structural equation modeling. *J Stat Softw* 2012;48:1–36.
48 TAM. Test analysis modules. R package version 4.1-4. 2022.