

What Do Care Staff Know About Behavioural and Psychological Symptoms of Dementia? A Mixed- Methods Study in Long-Term Care

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Abstract

Background

Behavioural and psychological symptoms of dementia (BPSD) are common and place demands on long-term care. BPSD knowledge supports early intervention and person-centred care, but staff knowledge gaps and practical management challenges remain insufficiently understood. This study measured care staff knowledge of Alzheimer's disease and BPSD, identified BPSD knowledge gaps, explored care management challenges, and integrated the findings to identify educational priorities.

Methods

A quantitatively driven mixed-methods design with sequential data collection was used in a Swedish municipality. A web-based cross-sectional survey included 196 care staff in nursing homes, home care, and home-based healthcare. Five assistant care staff participated in two focus groups. Quantitative data were analysed using descriptive statistics, non-parametric tests, Spearman's correlation, and Cronbach's alpha. Qualitative data underwent manifest content analysis. Item-level BPSD findings and qualitative categories were integrated using a joint display matrix.

Results

Mean scores were 23.45/30 (78.2%) for general Alzheimer's disease knowledge and 13.75/18 (76.4%) for BPSD knowledge; the scores were moderately correlated ($\rho = .598$, $p < .001$). Scores were higher among university-educated participants and home-based healthcare staff, and lower among those who did not report Swedish as their mother tongue. Recent dementia education was not associated with BPSD knowledge. Item-level analysis identified the main gaps as early intervention, psychological needs in daily care, and awareness that appropriate BPSD management can reduce care staff burden; only 49.7% answered the latter item fully correctly. Staff described BPSD management as relational and situational work aimed at creating relational trust through knowledge of the person, calm communication, and flexible adaptation. This work was constrained by fragmented continuity, insufficient information and documentation, time pressure, and limited shared learning. Integration suggested that explicit knowledge and practical competence were complementary but not equivalent, and that organisational conditions shaped staff's reported ability to apply knowledge.

Conclusions

Care staff's ability to manage BPSD cannot be understood from general knowledge scores alone, as gaps remained in knowledge of early intervention, psychological needs, and how appropriate BPSD management may reduce care staff burden; additionally, organisational conditions limited the consistent application of knowledge and practical competence. Education should therefore be targeted, practical, and linguistically accessible training accompanied by continuity of care, effective documentation, shared strategies, and team reflection to support person-centred BPSD care.

Background

The global ageing population and rising dementia prevalence emphasise the urgency of developing sustainable and equitable care (1, 2). Behavioural and Psychological symptoms of dementia (BPSD), also often called neuropsychiatric disturbances, are the most common term that covers dementia related mood, behaviour, and psychological symptoms that occur on a broad and diverse spectrum of symptoms (3). BPSD is linked to physical decline and worsening mental and cognitive functions. The prevalence is high; approximately 90% experience at least one symptom, which often recurs (4).

Due to BPSD's severe emotional symptoms, care poses challenges, increasing care staff burden and potentially elevating symptom escalation through mental and physical strain. Over the past two decades, dementia care has evolved from primarily pharmacological approaches to a growing emphasis on non-pharmacological, person-centred care, with improved care management and integrated care strategies and interventions (5). Persons with dementia (PwD) can struggle with heightened sensitivity to adverse interactions and cumulative effects of medication, and therefore, psychotropic treatment should be minimised and avoided as an alternative care solution (6, 7). The increased care needs drew attention to the significant social and clinical burden posed by BPSD, including higher healthcare costs, reduced quality of life for patients, and distress for care staff and care organisations (8). This is especially true when there is an urgent need for competent, skilled nursing care and high staff turnover, without comprehensive knowledge of dementia and BPSD (9, 10).

A multidimensional quality approach to dementia care requires care staff to have foundational knowledge of dementia and BPSD (11). Understanding the causes and management of BPSD, familiarity with non-pharmacological interventions, and awareness of residents' individual histories and preferences support personalised non-pharmacological care (12). Increased BPSD knowledge improves positive attitudes toward PwD and more positive caregiving experiences, especially when staff are confident in managing symptoms. In contrast, educational gaps and insufficient practical training can limit the use of management of care interventions (13, 14). International guidelines recommend ongoing, long-term education for both healthcare and social care staff, as building competence in dementia care requires focused efforts on knowledge-based interventions to advance dementia person-centred care (15, 16).

Future eldercare strategy in Europe needs a skilled workforce and capable care workers to deliver high-quality and sustainable eldercare (17). BPSD plays a significant role in care planning by guiding early intervention (18), identifying psychological needs, and shaping tailored, preventive strategies that respond to symptom changes across dementia stages and individual conditions. Moreover, increased care needs cause distress for the individual, reduce quality of life, raise care costs, and place additional strain on both family and professional care staff (19).

Limited dementia knowledge—particularly about the underlying drivers and presentation of BPSD—can intensify symptoms, heighten distress for people with dementia (PwD), and increase strain on care staff in long-term care. Although BPSD is widely recognised as a central challenge in dementia care, there is still not much we know about the knowledge level of care staff in dementia and BPSD and how this integrates with their perceived experiences. Standardised scales could help identify knowledge gaps and develop educational programs tailored to specific needs, which are important for nurses who create educational materials for bedside and hands-on care staff in long-term care.

Swedish context

In Sweden, there are 130,000–150,000 people living with dementia, and the number is increasing; every year, 20,000–25,000 people receive a dementia diagnosis, and care expenditure is rising from €3,400 three years before diagnosis to €49,700 six years after. Institutional care accounted for most of this difference. (20). Assistance care staff (ACS) constitute the largest group of professional care staff providing direct bedside care at both home care and nursing homes (long-term care). They have diverse educational backgrounds: assistant nurses and nurse assistants, most with secondary and vocational healthcare education. However, due to staff shortages, on-call substitutes often lack healthcare education and sometimes have only primary education. ACS provides daily support in long-term care, making them the largest workforce group in Swedish health and social care (21). They also constitute the largest foreign-born care group. Registered healthcare professionals such as BSc nurses, MSc specialist nurses, occupational therapists, and physiotherapists hold university degrees and work in separate teams that deliver medical care within social care. Due to rapid demographic changes in an ageing population, the demand for eldercare staff is increasing, contributing to staff shortages that, in turn, have led to greater reliance on staff without formal healthcare education. In addition, some care staff face other challenges, such as temporary difficulties in acquiring proficiency in Swedish. Swedish care staff have closely monitored BPSD through the national BPSD register, which recorded more than 320,000 BPSD incidents among approximately 110,000 persons living in nursing homes between 2010 and 2023, underscoring the high frequency of BPSD (22). In the latest government report, Sweden highlights the importance of interactions, early intervention, psychological needs, and stage-related variation in dementia care. In the latest government report, Sweden highlights the importance of interactions, early intervention, psychological needs, and stage-related variation in dementia care (23).

Aims

This study aimed to measure self-reported knowledge of Alzheimer's disease and BPSD with standardised scales and to identify areas of least knowledge, explore care problems with BPSD, and integrate the quantitative and qualitative findings to identify priorities for BPSD education and training

Research questions

1. What are the levels of ADKS and KS-BPSD-S scales among care staff in home care and nursing home settings? How are knowledge scores associated with workplace, level of general education, occupational experience, Swedish as a mother tongue, and self-rated BPSD knowledge?
2. Which questions gave the least knowledge in KS-BPSD-S, and what are these knowledge gaps?
3. How do assistant care staff describe their main challenges managing BPSD in practice, and what supports do they discern as most needed?
4. How do the quantitative findings on BPSD knowledge and the qualitative findings on BPSD management challenges combine priorities for BPSD education and training?

Method

Design

A cross-sectional, web-based multifaced mixed-methods study was conducted to measure ADKS and KS-BPSD-S among formal municipal-based care staff working in long-term care settings. Interviews were conducted afterwards with five ACSs.

A quantitatively driven mixed-methods design with sequential data collection was used (24). The core quantitative component consisted of a cross-sectional web-based survey, followed by a supplementary qualitative component comprising two focus group interviews (QUAN→qual) (25). A mixed-methods approach was best suited to the study because it quantified patterns and gaps in dementia and BPSD knowledge while providing contextual insights into care staff's perspectives and practices in managing BPSD. Neither strand alone could address both the measurable patterns of knowledge and the problematic care circumstances in which BPSD care occurs.

The quantitative survey was conducted first, followed by the focus group interviews. The quantitative and qualitative strands were analysed separately. Since the quantitative findings had not been fully calculated when the focus groups were conducted, the qualitative data collection was not based on the quantitative results. Instead, the qualitative component was used independently to explore practical BPSD management and perceived support needs. Integration occurred after the separate analyses, during interpretation and reporting, using a joint display to relate the two strands and inform priorities for BPSD education and training.

Research Context

The study was conducted in a mid-sized Swedish municipality. Eligible participants were formal care staff currently employed in long-term care services for older adults and actively involved in providing direct care. Their responsibilities included everyday personal care, such as assistance with meals, hygiene, toileting and continence care, as well as registered staff's healthcare-related interventions, such as nursing tasks, rehabilitation, or other specialised healthcare management. Care staff working in inpatient or outpatient healthcare settings were excluded.

Data collection

The research team first contacted the head of municipal eldercare services, who invited managers of long-term care settings to participate. The managers then informed staff about the study and encouraged them to complete the questionnaire. Data were collected between January 2026 and March 2026 on a web-based survey platform contracted by University. Participants accessed the questionnaire by scanning a QR code with their mobile devices. Data collection included the questionnaire, which assessed knowledge and collected a few demographic questions. Completion took approximately 6–10 minutes. Managers also distributed invitations to participate in focus group interviews. For the qualitative part, five ACS volunteers participated in two focus group interviews. The interviews were conducted during working hours and were considered part of the participants' shifts.

Instruments

The Alzheimer's Disease Knowledge Scale (ADKS) measured formal care staff's self-rated general knowledge of Alzheimer's disease. The 30-item true–false instrument covers seven domains: risk factors, assessment and diagnosis, symptoms, course, life impact, caregiving, and treatment and management; total scores range from 0 to 30, with higher scores indicating greater knowledge (26). To assess care staff's self-reported knowledge of BPSD, the 9-item KS-BPSD-S (First author et al., manuscript submitted for publication) was administered. It is a Swedish validation based on the KS-BPSD (27). The validation found that three items (items 4, 5, and 8) had to be removed from the original 12-item scale (Supplement about KS-BPSD scale). Before the Swedish validation, the KS-BPSD scale was translated into Swedish and culturally adapted according to the Swedish care context and language by the first author et. al. (manuscript submitted). The included items were: 1. Behavioural and Psychological Symptoms of Dementia (BPSD) occur frequently in patients with dementia. 2: Psychological symptoms (e.g., Apathy, depression, anxiety) are common BPSD among Chinese patients. 3: BPSD has different clinical manifestations in different stages of dementia. 6: Early intervention does not help caregivers manage patients' BPSD. 7: Poor interactions between patients with dementia and the caregiver can exacerbate BPSD. 9: Supporting programs for caregivers can help them manage BPSD more effectively. 10: The daily care of patient with BPSD should only focus on meeting their practical needs instead of psychological needs. 11. Compared with other symptoms of dementia, treatment on BPSD can reduce caregiving burden more effectively. 12: BPSD have a significant impact on patients' physical and mental health. Scores were calculated by summing the 9 items, with correct answers receiving 2 points, partly correct answers 1 point, and incorrect or "I do not know" responses 0 points, based on the original KS-BPSD scale. Total scores ranged from 0 to 18, with higher scores indicating greater BPSD knowledge. Demographic questions were also collected (Table 1).

Data Analysis

For the quantitative part, descriptive statistics summarised participants' sociodemographic characteristics and knowledge scores. Since the number of valid responses varied across variables, complete-case analyses were conducted for the final analysis of both scales. Group differences in ADKS and BPSD scores were examined using nonparametric tests because the normality assumption was not consistently met. Kruskal–Wallis tests were used for variables with more than two groups, such as education level, care setting, and years of experience. Mann–Whitney U tests were used for dichotomous variables, such as Swedish as mother tongue and participation in dementia education during the past three years. Significant group differences were followed by Bonferroni-adjusted pairwise comparisons.

Associations between categorical variables were examined using chi-square tests and Cramer's V. The relationship between ADKS and BPSD scores was assessed using Spearman's rank correlation. Internal consistency was evaluated using Cronbach's alpha. All analyses were performed in IBM SPSS Statistics version 26, with statistical significance set at $p < .05$.

For the qualitative analysis, manifest content analysis was employed according to (28). The two focus-group interviews were transcribed and read several times to develop an understanding of the text. Meaning units—words, sentences, or paragraphs that relate to the same central meaning—were then identified. These meaning units were condensed, translated into English, and subsequently coded. The codes were compared for similarities and differences and grouped into broader categories or subcategories. Categories primarily describe the shared content of the data and remained relatively close to what participants had explicitly expressed.

Integration was carried out as a last step. At the interpretation and reporting stage, the item-level KS-BPSD-S findings were merged with the qualitative categories and presented in a joint display matrix (29).

Ethical considerations

The study adhered to fundamental ethical principles, including respect for autonomy, transparency, providing complete information, and obtaining informed consent (30, 31). Participation was voluntary, responses were anonymised, and no personal identifiers were collected. Information letters and consent forms were emailed to directors and managers and embedded in the online platform for respondents. After data collection, the material was securely deleted and transferred to a protected server at [xxx] University. Regarding the focus group, the researcher did not ask for any personal details, e.g., names or telephone numbers. The audio file and the transcribed texts are kept on a double-locked server at xxx University. The Swedish Ethical Review Authority (Etikprövningsmyndigheten) approved the study (registration number 2023-03560-01) in accordance with the Swedish Ethical Review Act (32). All participants received written information about the study and provided informed consent before participation.

Results

The study included 196 participants ($n = 196$). Most respondents were assistant nurses (39.8%), followed by nursing aides (28.6%). Regarding work settings, most respondents (45.9%) worked in nursing homes, 34.7% in home care, and 19.4% in healthcare for social services. Among respondents with valid data on occupational experience ($n = 194$), 32.5% had worked with PwD for over 15 years, making this the largest experience group, while 28.9% had worked for 3–5 years. Among respondents with valid data for these variables ($n = 193$), 21.8% had not participated in a dementia education program during the previous three years, 65.8% had personal experience with PwD, and 60.6% reported Swedish as their mother tongue. Most respondents had secondary-level education

as their highest qualification (41.5%), whereas 24.9% had university education. Regarding self-rated knowledge, 51.8% rated their dementia knowledge as 5 or 6, and 56.0% rated their BPSD knowledge as 5 or 6 on the six-point scale (Table 1).

The ADKS scale was completed by 170 (86.7%) respondents and the 9-item KS-BPSD-S by 161 (82.1%) respondents. Analyses involving the KS-BPSD-S were based on the 161 respondents who completed that scale, and analyses involving only the ADKS were based on the 170 who completed the ADKS. Missing data accounted for 35 cases (17.9%) for the BPSD scale and 26 cases (13.3%) for the ADKS scale. Missing data were handled using listwise deletion, whereby cases with incomplete observations were excluded from the analysis. Both the ADKS ($n = 170$) and KS-BPSD-S ($n = 161$) scales demonstrated acceptable internal consistency. Cronbach's alpha was $\alpha = .73$, 95% CI [.68, .78] for the ADKS and $\alpha = .78$, 95% CI [.73, .83] for the KS-BPSD-S.

Table 1
Demographic characteristics

Characteristics	n	%
<i>Profession (n = 196/100%)</i>		
BSc nurse	14	7.1
Assistant Nurse	78	39.8
Specialised MSc Nurse	9	4.6
Specialised assistant nurse	2	1.0
Care assistant	56	28.6
On-call substitute assistant	11	5.6
Physio/Occ. therapist and others	14	7.1
Other	12	6.1
<i>Occupational experience in dementia care (years) (n = 194/99%)</i>		
≤ 2	17	8.7
3–5	56	28.6
6–10	31	15.8
11–15	27	13.8
> 15	63	32.1
<i>Workplace</i>		
Nursing home	90	45.9
Social homecare	68	34.7
Home-based healthcare	38	19.4
<i>Education program about dementia in the last 3 yrs (n = 193/98.5%)</i>		
Yes/No	151/42	77.0/21.4
<i>Experience of PwD in personal life (n = 193/98.5%)</i>		
Yes/No/Prefer not to answer	127/59/7	64.8/30.1/3.6
<i>Highest level of education (n = 193/98.5%)</i>		
University education	48	24.9
Vocational school	21	10.9
Secondary level	80	41.5
Primary level	38	19.7
Other	6	3.1
<i>Swedish mother tongue (n = 193/98.5%)</i>		
Yes/No	117/76	59.7/38.8
<i>Self-perceived knowledge about dementia and BPSD (Dementia/BPSD) (n = 193/98.5%)</i>		
1 - Very little	10/7	5.1/3.6
2	5/4	2.6/2.0
3	34/29	17.3/14.8
4	44/45	22.4/23.0
5	39/48	19.9/24.5
6 – Very much	61/60	31.1/30.6

Respondents achieved 78.2% of the maximum possible ADKS score (M = 23.45/30) and 76.4% of the maximum possible 9-item KS-BPSD-S score (M = 13.75/18, SD = 3.99). This indicates relatively similar overall knowledge levels across the two scales, although the mean scores remained below the maximum by 6.55 points for the ADKS and 4.25 points for the KS-BPSD-S.

Spearman's rho indicated a moderate positive association between general Alzheimer's disease knowledge and BPSD knowledge ($p = .598$, 95% CI [.488, .689], $p < .001$, $N = 161$) (Fig. 1).

Among participants with a university education ($n = 48$), most worked in healthcare services (HS) ($n = 33$; 68.8%), while smaller proportions worked in nursing homes (NH) ($n = 8$; 16.7%) and home care (HC) ($n = 7$; 14.6%). Among participants with secondary/vocational education ($n = 104$), the majority worked in NH ($n = 59$; 56.7%) and HC ($n = 40$; 38.5%), with few working in HS ($n = 5$; 4.8%). Participants with primary school education ($n = 38$) worked in NH ($n = 20$; 52.6%) or HC ($n = 18$; 47.4%), with none working in HS. Overall, participants were most commonly employed in NH ($n = 87$; 45.8%), followed by HC ($n = 65$; 34.2%) and HS ($n = 38$; 20.0%). The association between education level and workplace was statistically significant, $\chi^2(4, N = 190) = 96.52$, $p < .001$, Cramer's $V = .504$ (Fig. 2).

Regarding educational background, participants with a university education had the highest mean ADKS knowledge score ($M = 25.28$, 95% CI [24.26, 26.30], $SD = 3.44$, $n = 46$). Those with secondary education scored $M = 23.36$ (95% CI [22.70, 24.02], $SD = 3.19$, $n = 92$), while participants with a primary school background had the lowest score ($M = 21.03$, 95% CI [19.17, 22.90], $SD = 4.90$, $n = 29$). Group differences were significant (Kruskal–Wallis $H(2) = 20.656$, $p < .001$). Bonferroni-adjusted post-hoc tests showed that the university-education group scored significantly higher than the secondary-education group ($p_{adj} = .004$) and the primary-education group ($p_{adj} < .001$), whereas the secondary- and primary-education groups did not differ significantly ($p_{adj} = .085$).

Respondents with a university education on the KS-BPSD-S scale had the highest mean score ($M = 15.33$, 95% CI [14.30, 16.35], $SD = 3.34$, $n = 43$). Those with secondary education scored $M = 13.67$ (95% CI [12.92, 14.42], $SD = 3.54$, $n = 88$), while participants with a primary school background had the lowest score ($M = 11.78$, 95% CI [9.84, 13.72], $SD = 4.90$, $n = 27$). Bonferroni-adjusted post-hoc comparisons showed that the university group scored significantly higher than the secondary education group ($p_{adj} = .014$) and the primary school group ($p_{adj} < .001$), whereas the secondary and primary school groups did not differ significantly ($p_{adj} = .306$).

ADKS total scores differed by care setting (Kruskal–Wallis $H(2) = 26.758$, $p < .001$; $N = 170$). Participants in healthcare services (HS) had higher scores ($M = 26.21$, $SD = 2.27$, $n = 38$) than those in home care (HC) ($M = 22.32$, $SD = 4.27$, $n = 53$) and nursing homes (NH) ($M = 22.89$, $SD = 3.73$, $n = 79$). Bonferroni-adjusted post-hoc tests confirmed differences for HS vs HC ($p_{adj} < .001$) and HS vs NH ($p_{adj} < .001$), whereas HC vs NH was not significant ($p_{adj} = 1.000$).

Total scores on KS-BPSD-S differed by care setting (Kruskal–Wallis $H(2) = 10.758$, $p = .005$; $N = 161$). Participants in healthcare services (HS) had higher scores ($M = 15.59$, $SD = 2.53$, $n = 37$) than those in home care (HC) ($M = 12.94$, $SD = 4.35$, $n = 47$) and nursing homes (NH) ($M = 13.35$, $SD = 4.10$, $n = 77$). Bonferroni-adjusted post-hoc tests confirmed differences for HS vs HC ($p_{adj} = .008$) and HS vs NH ($p_{adj} = .012$), whereas HC vs NH was not significant ($p_{adj} = 1.000$).

Based on occupational experience, the total scores for the ADKS scale were significantly associated with the length of experience in the healthcare or social care sector ($p = .008$, two-sided); however, the KS-BPSD-S scores were not (Kruskal–Wallis $H(4) = 4.66$, $p = .324$, two-sided).

No significant difference in BPSD knowledge was found between participants who had participated in **internal and external dementia education** during the past three years ($M = 13.80$, $SD = 4.02$, $n = 123$) and those who had not ($M = 13.55$, $SD = 3.95$, $n = 38$), Mann–Whitney $U = 2171.00$, $z = -0.67$, $p = .505$, $N = 161$.

Self-rated BPSD knowledge was associated with KS-BPSD-S scores at the threshold of statistical significance (Kruskal–Wallis $H(5) = 11.09$, $p = .050$, $N = 161$).

Significant group differences were found for both knowledge scales, with Swedish as a mother tongue. Participants with Swedish as their mother tongue scored higher on the ADKS ($M = 24.65$, $SD = 2.92$, $n = 112$) than those who were non-native speakers ($M = 21.14$, $SD = 4.57$, $n = 58$), Mann–Whitney $U = 1742.00$, $z = -4.97$, $p < .001$. The same pattern was observed for the 9-item KS-BPSD-S scale, where participants with Swedish as their mother tongue had higher scores ($M = 14.49$, $SD = 3.45$, $n = 108$) than those without Swedish as their mother tongue ($M = 12.23$, $SD = 4.58$, $n = 53$), Mann–Whitney $U = 1966.50$, $z = -3.25$, $p = .001$.

The item-level results showed that most participants answered several items on KS-BPSD-S “completely correctly”, particularly Q12 (75.8%), Q2 (74.5%), and Q3 (73.9%). However, knowledge was weakest for Q11, with only 49.7% of participants responding completely correctly. Q6 had the highest proportion of completely incorrect responses (29.8%), followed by Q11 (25.5%) and Q10 (24.2%). Overall, Q11, Q6, and Q10 represented the principal item-level knowledge gaps on the nine-item KS-BPSD-S, indicating that participants had comparatively stronger knowledge on some BPSD-related topics, but greater uncertainty regarding early intervention (Q6), the psychological focus of daily care (Q10), and the impact of BPSD treatment on care staff burden (Q11). Overall, Table 2 and Fig. 3 highlight item-specific differences in knowledge, and Table 3 displays the three worst items where respondents demonstrated the weakest knowledge.

Table 2
Percentage in knowledge on the item-specific KS-BPSD-S

Item	Completely correct	Nearly correct	Completely incorrect	Total (N)
Q1	117 (72.7)	27 (16.8)	17 (10.6)	161
Q2	120 (74.5)	28 (17.4)	13 (8.1)	161
Q3	119 (73.9)	31 (19.3)	11 (6.8)	161
Q6	99 (61.5)	14 (8.7)	48 (29.8)	161
Q7	106 (65.8)	33 (20.5)	22 (13.7)	161
Q9	116 (72.0)	29 (18.0)	16 (9.9)	161
Q10	107 (66.5)	15 (9.3)	39 (24.2)	161
Q11	80 (49.7)	40 (24.8)	41 (25.5)	161
Q12	122 (75.8)	24 (14.9)	15 (9.3)	161

*items 4, 5, and 8 were removed following the Swedish validation

Table 3
The three KS-BPSD-S items with the lowest mean scores, ordered from lowest to highest

Item	Mean item score	Correct answer
Q11	1.24	True
Q6	1.32	False
Q10	1.42	False

* Question 11: Compared with other symptoms of dementia, treatment on BPSD can reduce caregiving burden more effectively. Question 6: Early intervention does not help caregivers manage patients' BPSD. Question 10: The daily care of patient with BPSD should only focus on meeting their practical needs instead of psychological needs.

Result of the qualitative part

Overarching theme: Creating relational trust despite fragmented time, continuity, and shared knowledge

The overarching theme conceptualizes how nursing staff presented BPSD management as relational, situational, and practical work. Staff did not primarily describe BPSD as isolated symptoms to be controlled; instead, they described everyday care situations in which trust had to be built through knowledge of the person, calm communication, flexible adaptation, and shared support. At the same time, they explained that this work was made difficult by fragmented continuity, insufficient information, incomplete documentation, lack of time, and limited opportunities for staff to learn from one another. (Table 4).

Table 4
Categories and codes

Categories	Codes included
<i>Insufficient knowledge and fragmented continuity</i>	Insufficient pre-visit information; difficulty knowing the person; lack of continuity; inconsistent documentation and care plans; need for core staff around the person
<i>Building relational trust through person-centred communication</i>	Relational work before tasks; reading the person's signals; adapting communication and approach; using life history, interests and home cues; experience and person-centred attitude
<i>Flexible management of resistance, agitation and daily care situations</i>	Backing off and restarting; meal support through trial and adaptation; managing agitation and aggression; staff matching and person chemistry; coordinating two-staff visits
<i>Shared support structures needed around staff</i>	Relatives and guardians as knowledge support; need for team reflection and shared strategies; lack of resources and colleague support
<i>Organisational time pressure and ethical prioritisation</i>	Time pressure; balancing task completion with dignity and trust; stress affecting the person with dementia

Insufficient knowledge and fragmented continuity

This category consists of staff descriptions of insufficient pre-visit information, difficulty knowing the person, lack of continuity, inconsistent documentation and care plans, and the need for a smaller core group around the person. The category shows that staff often entered BPSD-related situations without enough shared knowledge about the diagnosis, type of dementia, personal history, preferences, triggers, or previously successful approaches. Managing

BPSD, therefore, became dependent on guessing, quickly reading the situation, and trying to create a trusting encounter without a stable relational foundation.

AN described having to handle dementia-related difficulties without knowing beforehand whether the person had a diagnosis or what kind of dementia it was.

"We rarely know if someone has a dementia diagnosis. We often do not get that information before; we have to discover it on site, and in a very short time we have to handle it." (FG1)

AN described a need for a smaller group who could gradually build knowledge and trust around the person.

"The best would be, when there are new care users, that there is a small core group who goes there and works their way in. But today it can be ten different people, and then it becomes unsafe for the person and unsafe for us too." (FG1)

Building relational trust through person-centred communication

This category consists of relational work before tasks, reading the person's signals, adapting communication and approach, using life history, interests and home cues, and relying on experience and a person-centred attitude. Staff described that care could not be reduced to performing scheduled tasks. Before intimate care, medication, meals or hygiene could be carried out, the PwD needed to feel safe with the staff member.

AN explained that relationship-building was central, but that it requires repeated contact and more time.

"That is probably the most important thing when working with people with dementia: to build a relationship. But you cannot do that if you are there once a month for twenty minutes." (FG1)

AN emphasised that dementia does not remove identity and that communication must be adapted to the person's life and personality.

"Dementia is not a personality trait; it is a disease. Everyone is their own person. We always have to look beyond the dementia and look at the personality. Always the person in centre." (FG1)

Flexible management of resistance, agitation and daily care situations

This category consists of backing off and restarting, trial-and-error adaptation in meal support, managing agitation and aggression, matching staff with persons, and coordinating two-staff visits. The category shows that staff described BPSD-related situations as changeable and dependent on the person's daily form, the staff member's approach, and the interaction between everyone present.

AN described stepping back when the encounter began to go wrong, rather than pushing forward.

"You try to sense the situation. You move forward, but if it does not work you can back two steps to be able to take one step forward." (FG1)

AN explained that two-staff visits could either support care or make the situation worse, depending on coordination and the person's reaction.

"If the person is aggressive toward the one I have with me, and it goes well with me, then that staff member backs off and I work closer. Then we help each other when it is needed." (FG2)

Shared support structures needed around staff

This category includes relatives and guardians as knowledge support, the need for team reflection and shared strategies, and a lack of resources and colleague support. Staff described BPSD management as not only an individual skill but something that needed shared structures around the person and the staff group.

AN described relatives as a practical source of person-specific knowledge that could immediately change the encounter.

"Relatives are a very good tool for us. We found out that she liked music, and when we put on a record, she became a completely different person. Then it was much easier to work with her." (FG1)

AN described missing care-team meetings where common strategies could be discussed and spread.

Before, we had care-team meetings where we talked about the care users. Has anyone found a way that works? Then the rest of us could implement it too. Now it is more everyone for themselves.

Organisational time pressure and ethical prioritisation

This category consists of time pressure, balancing task completion with dignity and trust, and staff stress affecting the person with dementia. Staff described time as the strongest organisational obstacle to good BPSD care. They explained that scheduled minutes often did not match the time needed to create trust, reduce anxiety, perform intimate care safely or respond to the person's daily condition.

AN described that time pressure made it difficult to provide the kind of interaction they considered necessary.

"We barely have time. We do not have time for a good encounter. If it takes time, then it takes time, and I may have to work unpaid overtime." (FG1)

AN described having to compromise between relational trust and task completion.

"Sometimes it becomes: today you get a very good interaction, but I cannot do all the interventions. Or the other way around: today the shower is priority, and then we must compromise a little on the interaction." (FG1)

Data Integration

Joint-display analysis was employed to visually demonstrate the integration of quantitative and qualitative data in this descriptive mixed-methods design. Findings were compared to identify convergence or divergence, and no divergence was found. The integration primarily revealed convergence and elaboration, as qualitative findings supported quantitative results and enhanced understanding of BPSD knowledge within organisational limitations. (Table 5).

Table 5
Joint-display table based on the quantitative and qualitative findings

Item	Knowledge content	Quantitative result	Priority	Linked qualitative category	Qualitative evidence	Integration inference	Implication
Q1	BPSD often occur in dementia	117/161 fully correct (72.7%); 27 nearly correct (16.8%); 17 incorrect (10.6%)	Lower priority	Insufficient knowledge and fragmented continuity; flexible management of resistance/agitation	Staff clearly described anxiety, resistance, agitation and insecurity as recurring in everyday care.	Convergence: the quantitative result and qualitative descriptions both show that BPSD are recognised as common in practice.	Keep as foundation knowledge; connect prevalence knowledge to assessment and documentation.
Q2	Psychological symptoms such as apathy, depression and anxiety are common BPSD	120/161 fully correct (74.5%); 28 nearly correct (17.4%); 13 incorrect (8.1%)	Lower priority	Building relational safety through person-centred communication	Staff repeatedly described worry, insecurity, anxiety and emotional reactions as central to the care situation.	Convergence: staff seem to recognise psychological and emotional aspects of BPSD.	Maintain focus on emotional/psychological symptoms in training, not only observable behaviours.
Q3	BPSD differ across stages/situations in dementia	119/161 fully correct (73.9%); 31 nearly correct (19.3%); 11 incorrect (6.8%)	Lower priority	Flexible management of resistance, agitation and daily care situations	Staff described that the same visit may work nine times but fail the tenth time, and that approach must follow the person's day-form.	Convergence/expansion: quantitative knowledge of variation is reflected in flexible daily practice.	Use this knowledge to teach structured observation of trigger patterns and changes over time.
Q6	Early intervention does help caregivers manage BPSD (item worded negatively; correct answer: false)	99/161 fully correct (61.5%); 14 nearly correct (8.7%); 48 incorrect (29.8%)	High priority	Insufficient knowledge and fragmented continuity; shared support structures needed around staff	Staff asked for early information, core staff around new care recipients, and shared ways of working before problems escalate.	Complementarity: the item result shows a knowledge gap about early intervention, while the interviews show why early recognition and shared planning are needed in practice.	Prioritise education on early identification, early relational work, early BPSD assessment and early care planning.
Q7	Poor interpersonal interaction can worsen BPSD	106/161 fully correct (65.8%); 33 nearly correct (20.5%); 22 incorrect (13.7%)	Moderate priority	Building relational safety through person-centred communication; organisational time pressure and ethical prioritisation	Staff described that stress, rushing, unsuitable joking or not reading subtle signals could increase irritation or agitation.	Strong convergence: staff's practical experience supports the item, but item performance indicates that this knowledge should be strengthened.	Train staff in communication, validation, body language, tone, pacing and recognising early signs of escalation.
Q9	Support training for caregivers helps them manage BPSD more effectively	116/161 fully correct (72.0%); 29 nearly correct (18.0%); 16 incorrect (9.9%)	Lower priority	Shared support structures needed around staff	Staff wanted team meetings, shared strategies, colleague support and ways to transfer what works between staff.	Convergence/expansion: staff know support/training matters, but qualitative data clarify that support must be practical, shared and workplace-based.	Develop practice-based learning: team reflection, case discussions, mentoring and shared action plans.
*items 4, 5, and 8 were removed after the Swedish validation							

Item	Knowledge content	Quantitative result	Priority	Linked qualitative category	Qualitative evidence	Integration inference	Implication
Q10	Daily care must consider psychological feelings, not only practical needs (item worded negatively; correct answer: false)	107/161 fully correct (66.5%); 15 nearly correct (9.3%); 39 incorrect (24.2%)	Moderate-high priority	Building relational safety through person-centred communication; organisational time pressure and ethical prioritisation	Staff said they must see the person, confirm feelings, work at the person's pace and sometimes leave tasks undone to preserve calmness and dignity.	Tension/complementarity: interviews strongly emphasise psychological needs, but a sizeable minority answered the item incorrectly, and time pressure may push practice toward tasks.	Emphasise that emotional safety is part of the care task, not a optional addition after practical needs.
Q11	Appropriate treatment/management of BPSD can reduce caregiver burden	80/161 fully correct (49.7%); 40 nearly correct (24.8%); 41 incorrect (25.5%)	Highest priority	Shared support structures needed around staff; organisational time pressure and ethical prioritisation; flexible management	Staff described BPSD care as demanding when time, continuity, action plans and colleague support were lacking.	Expansion: this was the weakest item. Qualitative findings suggest that staff experience burden but may not connect structured BPSD management with burden reduction.	Teach how non-pharmacological BPS management, shared plans and consistent approaches reduce workload, stress and repeated failed visits.
Q12	BPSD have significant physical and mental health impact for the person	122/161 fully correct (75.8%); 24 nearly correct (14.9%); 15 incorrect (9.3%)	Lower priority	Organisational time pressure and ethical prioritisation; flexible management of daily care	Staff described effects on eating, hygiene, insecurity, agitation, anxiety and the ability to accept help.	Convergence: staff recognise that BPSD affects the person's well-being and care situation.	Use as a bridge from person impact to preventive intervention and care planning.
*items 4, 5, and 8 were removed after the Swedish validation							

Discussion

The ADKS and KS-BPSD-S were used to assess care staff knowledge of Alzheimer's disease and BPSD. Of the 196 participants, 170 completed the ADKS, and 161 completed the KS-BPSD-S, 161 respondents had valid scores on both scales. The mean score was 23.45 out of 30 (78.2%) on the ADKS and 13.75 out of 18 (76.4%; SD = 3.99) on the nine-item KS-BPSD-S. ADKS and KS-BPSD-S scores were moderately positively associated (Spearman's $\rho = .598$, 95% CI [.488, .689], $p < .001$). Participants with stronger general dementia knowledge therefore tended to have stronger BPSD knowledge, although the two forms of knowledge were not interchangeable. Knowledge scores differed significantly by education level, care setting, and Swedish mother-tongue status. Occupational experience was associated with ADKS scores but not with KS-BPSD-S scores.

Participants with university education achieved higher scores on both scales. This finding reflects broader structural inequalities in the distribution of formal education among formal care staff. Healthcare settings are more likely to employ care staff with higher levels of formal education, which is generally associated with greater knowledge (33). In contrast, long-term care settings tend to show a more uneven distribution of educational qualifications, with a larger proportion of care staff holding vocational training or no formal care education. Consequently, the observed differences in knowledge across care settings may partly reflect differences in the workforce's educational composition. However, the present analyses do not establish whether education level or care setting independently accounts for these differences. Nevertheless, greater knowledge of BPSD is associated with more positive effects on caregiving attitudes (14), which could be a strong reason bedside care staff need better knowledge of Alzheimer's. and BPSD.

Length of occupational experience in care was significantly associated with ADKS scores, whereas no significant association was found with KS-BPSD-S. This suggests that general dementia knowledge could develop through occupational experience with PwD, while experience does not necessarily ensure explicit knowledge about BPSD. Moreover, BPSD knowledge did not differ significantly between care staff who had attended dementia-related training in the past three years and those who had not. This finding indicates that KS-BPSD-S results may require more specific theoretical and practical training, which may be better gained through direct practical skill training about BPSD rather than only theoretical and general education about dementia. (34, 35).

Similarly, participants whose mother tongue was Swedish scored higher than participants whose mother tongue was not Swedish. The differences amounted to 3.51 points on the ADKS and 2.26 points on the KS-BPSD-S. The results suggest the importance of language in accessing, understanding, and applying dementia-related knowledge and BPSD in Swedish care contexts. Non-Swedish care workers possibly face many challenges, including communication barriers, limited language knowledge, and cultural and religious differences (36). Training for care staff without Swedish as their mother tongue should therefore consider their difficulties with terminology, written educational materials, guidelines, and communication-based care strategies. Therefore, equal

access to dementia- and BPSD-related knowledge should be provided, with consideration for care staff's differences in background and language knowledge in the country where care is provided. This recommendation should not be interpreted as indicating lower caring ability for these care staff.

Item-level analysis of KS-BPSD-S provides greater clinical and educational value than reliance on the total scores, as the findings demonstrate important gaps in translating knowledge into practice. This analysis revealed that care staff's BPSD knowledge was comparatively high regarding the prevalence, manifestations, and consequences of BPSD, whereas greater uncertainty concerned early intervention, the importance of psychological needs, and the potential of appropriate BPSD management to reduce care staff burden. The qualitative findings revealed that care staff frequently used relational and person-centred strategies in practice, including reading the person's signals, adapting communication, validating emotions, and withdrawing when an encounter risked escalation. These approaches are highlighted as missing dementia care strategies (37).

The joint-display integration illustrates that explicit knowledge measured by the scale and tacit practical competence overlap but are not equivalent forms of knowledge. Moreover, organisational conditions—including time, continuity, documentation, and opportunities for shared reflection—appear to influence whether knowledge can be translated into consistent practice, which are factors of good person-centred dementia care (38). The weakest quantitative item concerned the relationship between BPSD management and care staff burden. Qualitatively, these weaker items were described as repeated failed visits, uncertainty, emotional strain, lack of colleague support, inadequate action plans, and the need to work overtime when care could not be completed within allocated time. The integration also shows that care staff experience the burden associated with BPSD and highlight organisational system problems, but may not consistently recognise or feel empowered to influence early assessment, shared plans, continuity, and non-pharmacological interventions to reduce repeated conflict and workload (10, 39). The overarching integrated pattern indicates a need to strengthen care staff's capacity to create relational trust in care encounters despite fragmented time, limited continuity, and insufficient shared knowledge (40). These findings indicate a gap between descriptive awareness of BPSD and action-oriented knowledge concerning how symptoms may be prevented, interpreted, and managed (40, 41).

Overall KS-BPSD-S levels are closely intertwined with organisational shortcomings, which play a decisive role in shaping the delivery of appropriate care. The scale therefore reframes the identified gaps as partly structural in nature and highlights the importance of reassessing the identified knowledge deficits in order to develop educational interventions addressing both specific knowledge areas tailored to care staff's linguistic backgrounds and the environmental and organisational constraints that influence the application of this knowledge in everyday practice (42, 43). Case-based, team-oriented education embedded in practice supports person-centred dementia care.

Strengths and Limitations

The ADKS was used to assess general dementia knowledge because no standardised instrument for this purpose is currently available. As Alzheimer's disease accounts for an estimated 60–70% of dementia cases, the scale still covers the most common form of dementia. The KS-BPSD-S score was based on the validated 9-item Swedish version.

Two of the three most difficult items on KS-BPSD-S were negatively worded. These results should therefore be interpreted cautiously, as incorrect responses may partly reflect misunderstanding, especially among respondents with different educational and language backgrounds.

The instruments also used different response formats. The ADKS has dichotomous true/false responses, whereas the KS-BPSD-S scale uses Likert-type responses that were recoded into three categories according to the authors' instructions. This may have reduced response nuance and limited comparability between the scales.

In the focus group interviews, the number of volunteered assistant care personnel was relatively small and represented only assistant care personnel. These drawbacks limit the extent to which the integrated interpretations can be generalised.

Despite these limitations, the study has notable strengths. It demonstrated the heterogeneous background of the respondents and identified differences in ADKS and KS-BPSD-S knowledge across care settings. The item-level analysis pinpointed the items most frequently answered incorrectly, providing a precise mapping of knowledge deficits. The qualitative themes highlight care staff's concerns, which could be incorporated into education and draw stakeholders' attention. The joint-display matrix integrated both methods and was well conceptualised in how BPSD education should address both item-specific knowledge gaps and the organisational problems. This conclusion could not have been derived from either strand alone. The integrated findings therefore demonstrate evidence-based practice on how knowledge gaps should be interpreted alongside structural and organisational conditions that influence whether knowledge can be applied in practice.

Conclusion

Greater knowledge of BPSD in long-term care requires more than general dementia education. Training should specifically address the importance of preventing BPSD, how to interpret behavioural changes, ways to manage psychological drivers, and the importance of intervention strategies. More attention should be given to care staff, who often have close daily contact with PwD where formal educational levels may be lower, and many care staff's first language is not the language of care. Dementia care depends not only on fine-tuned dementia education and training about BPSD but also on improved communication among staff, strengthened by better organisational conditions. Care organisations should, during training and education, consider suitable language, practical demonstrations, opportunities to share successful strategies, and relational competence in care. These improvements may help reduce staff shortages and rapid turnover, which in turn would support more sustainable person-centred dementia care in long-term care. KS-BPSD-S may be useful for identifying and evaluating learning needs at the group level; however, it should be complemented by assessments of practical skills and is not suitable as a stand-alone measure of individual competence.

Declarations

Ethics approval and consent to participate

The Swedish Ethical Review Authority approved this study in accordance with the Swedish Ethical Law. The registration number is: **2023-03560-01**. All participants received written information about the study, and we obtained informed consent before data collection.

Consent for publication

Not applicable

Competing interests

The authors declare no competing interests.

Authors' information

The authors are affiliated with Mid Sweden University and have expertise in nursing, dementia care, mental health, and midwifery. Their research focuses on person-centred care, dementia, and knowledge in healthcare settings.

Clinical trials

Clinical trial number: not applicable

Disclaimer

During manuscript preparation, the first author used *Grammarly*® and *ChatGPT*® to refine the English language and ensure linguistic and contextual coherence, as well as equivalence with English care contexts. After using these tools, the first author reviewed and edited the text to ensure its authenticity.

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Author Contribution

Conceptualization: JS. Investigation, Data collection: JS, AKA, LPK. Checking the statistical analysis and analysis of the qualitative part: JS. Writing - original draft: JS. Supervision and re-checking: AKA, LPK.

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Data Availability

The quantitative survey dataset generated and analysed during the current study is available from the corresponding author upon reasonable request, subject to approval by the relevant institutional ethics board. The qualitative focus-group data consist of transcripts in Swedish and are not deposited in a public repository. These data are securely stored in accordance with applicable ethical and data-protection requirements.

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Figures

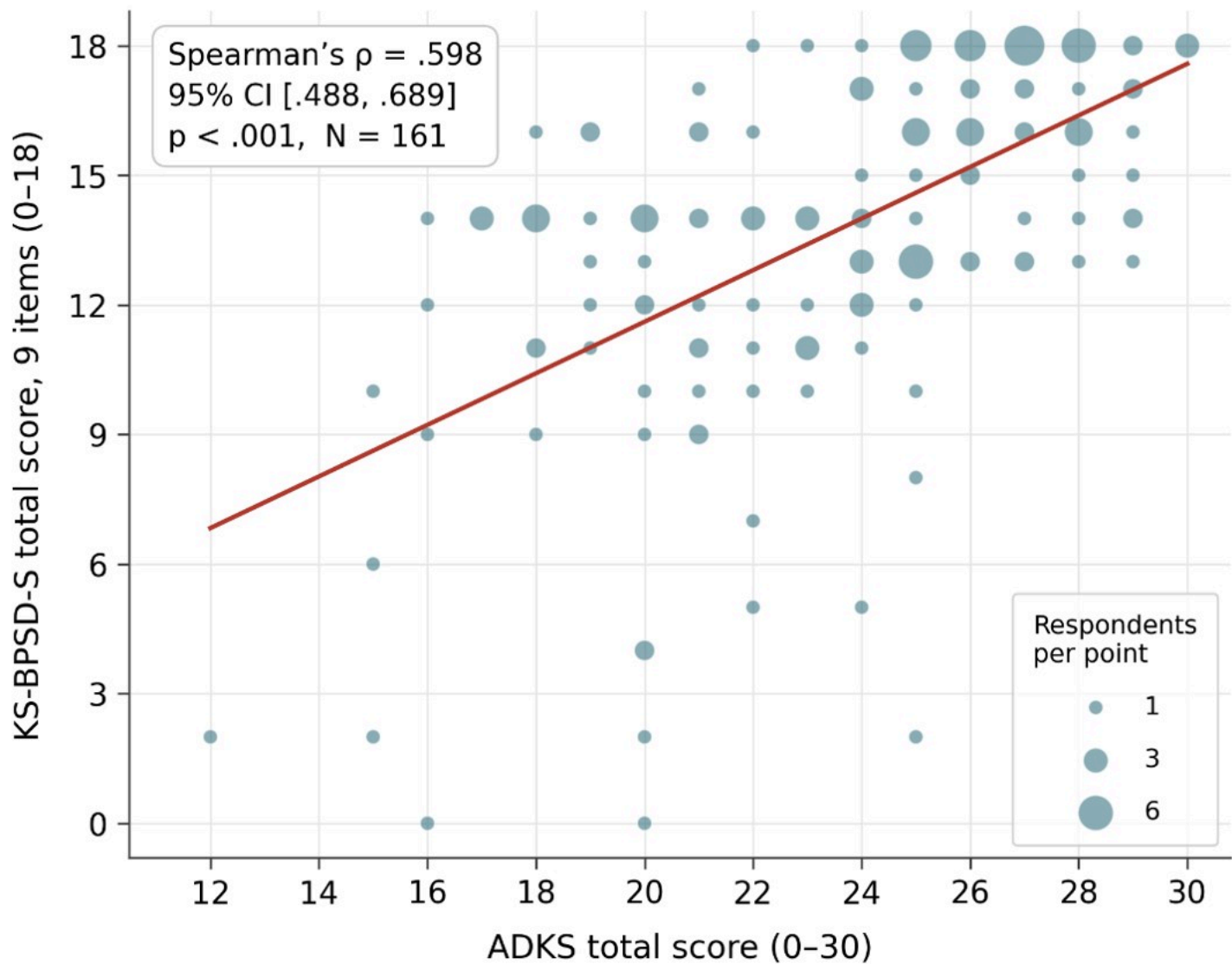


Figure 1

Scatter plot for the correlation between ADKS and KS-BPSD-S

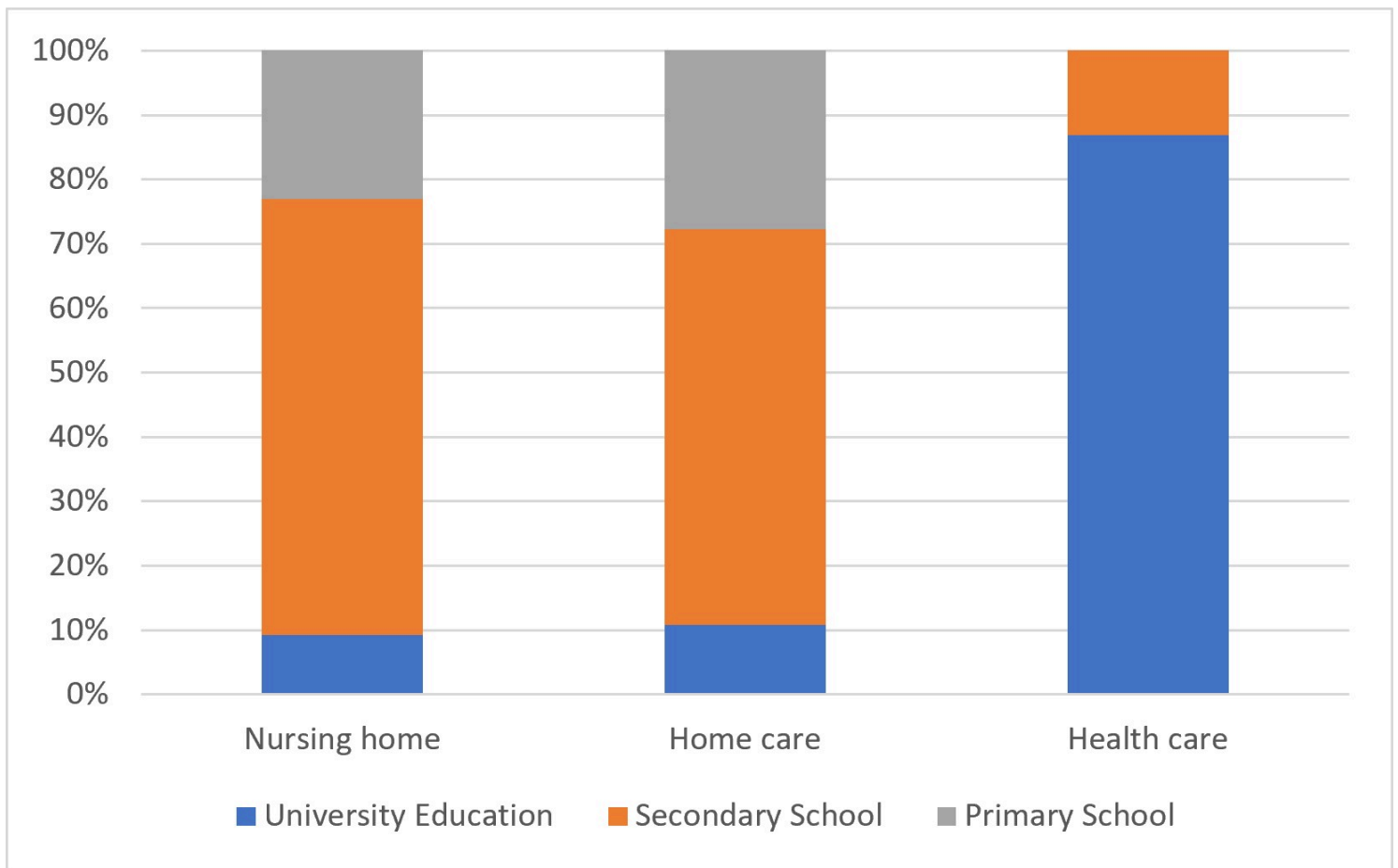


Figure 2

Association between education level and workplace

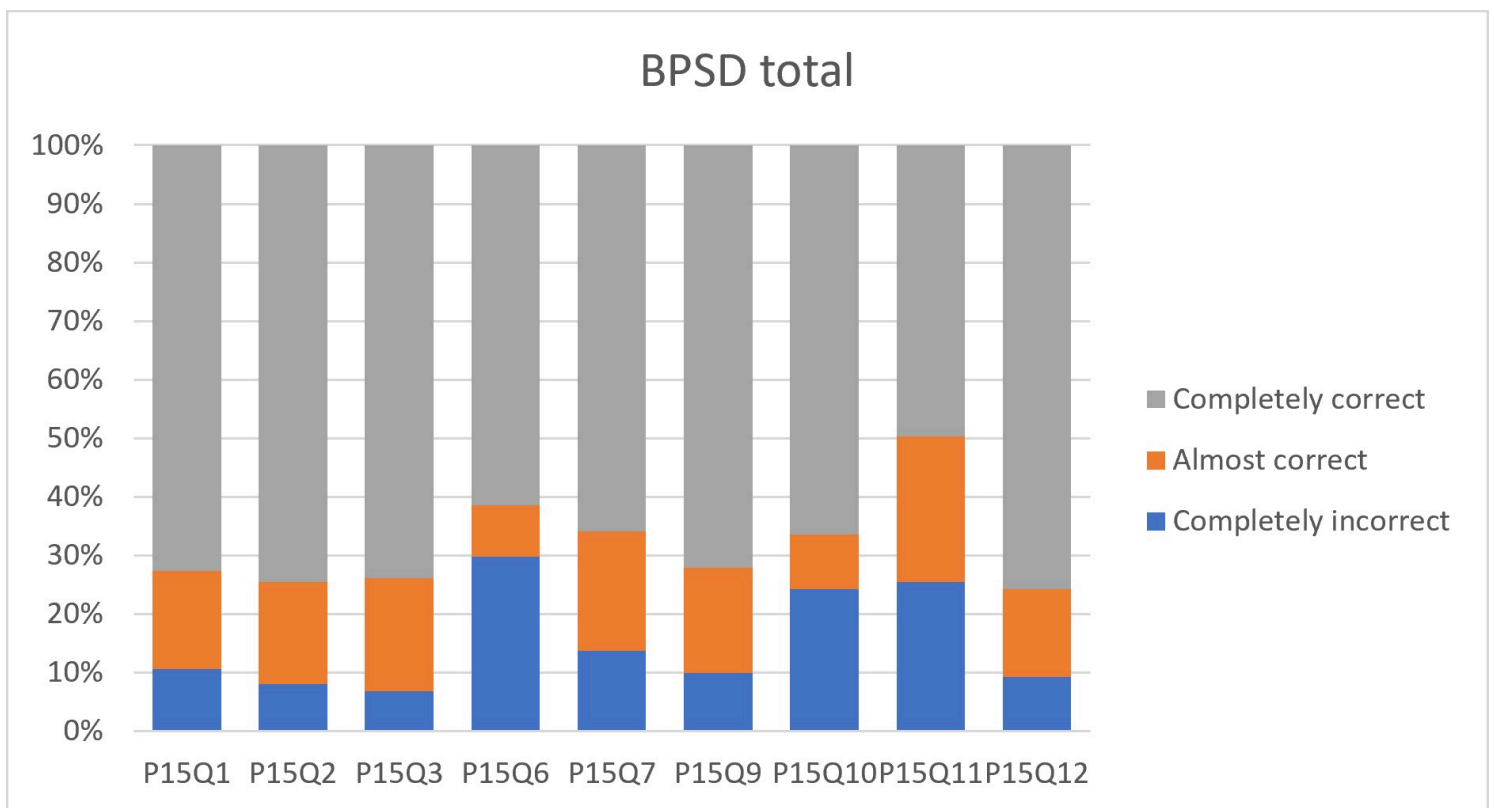


Figure 3

Distribution of responses to the 9-item KS-BPSD-S knowledge scale. Percentages are based on valid responses for each item, N = 161.