

ORIGINAL ARTICLE

Exploring nurses' recognition of delirium in the elderly by using Q-methodology

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Abstract

Aim: Despite its high prevalence and seriousness, delirium has been underrecognized by nurses. One reason is that the original characteristics of delirium are relatively unspecific and phenomenologically diverse, which makes a nurse's subjective decision more important in delirium detection. This study aims to identify the experiences, practices, and viewpoints of nurses in recognizing delirium in the elderly.

Methods: In this study, Q-methodology, which is a method for analyzing subjectivity, was used. Following the steps of Q-methodology, 32 nurses with experiences in caring for the delirious elderly sorted 34 Q-statements into the shape of a normal distribution. A centroid factor analysis and varimax rotation using the PQMethod program were conducted.

Results: This study revealed four factors regarding nurses toward delirium recognition in the elderly. They were: Factor I, prediction from the integrated signs; Factor II, visible symptom-centered detection; Factor III, the detection of abnormal changes based on concentrated observation; and Factor IV, identification by relying on the diagnostic data.

Conclusion: The result of the study can help to understand elderly delirium detection more practically from a nurse's point of view. It is expected to be used as a basis for a practical and accessible delirium education for nurses that reflects nurses' subjective viewpoints.

Key words: aged, delirium, nursing, Q methodology, recognition.

INTRODUCTION

Delirium is defined as an acute and fluctuating syndrome of cognition and attention (American Psychiatric Association, 2013). It is common in long-term care facilities and hospitals and often is fatal for seniors (Inouye, Westendorp, & Saczynski, 2014).

Early detection and appropriate management are the most important factors for the prevention and treatment of delirium. As delirium is a reversible disease that is preventable and treatable with an elimination of its underlying causes, early detection through the thorough screening of patients with a high risk of delirium or

presymptoms is the key to delirium care (O'Mahony, Murthy, Akunne, & Young, 2010).

Without appropriate management during delirium's early stages, it can lead to poorer patient outcomes, such as an increased risk of falls, pressure sores, functional decline, higher medical costs, and longer institutionalization duration (Boockvar, Signor, Ramaswamy, & Hung, 2013; Witlox *et al.*, 2010). Especially among older patients with dementia, delirium is associated with increased rates of cognitive decline and mortality (Fong *et al.*, 2009).

However, studies have suggested that the underrecognition of delirium is an international problem (Malik, Harlan, & Cobb, 2016). One reason for delirium underrecognition is that caregivers' subjectivity can affect clinical decisions in a variety of ways (Hosie, Agar, Lobb, Davidson, & Phillips, 2014; Wong, Holroyd-Leduc, Simel, & Straus, 2010). Why subjective

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clinical decisions play an important role in delirium recognition, regardless of whether the delirium screening scale is used or not, is linked to the fluctuation and widely differing presentations of delirium. As delirium is characterized by a vague change of symptoms and a range of manifestations and degree of severity, even in the course of a single day, it can be difficult to diagnose (de Rooij, Schuurmans, van der Mast, & Levi, 2005).

Researchers have shown that a combination of factors related to nurses' subjectivity can contribute to the problem of underrecognition. For example, some nurses' subjective recognition of delirium is as a natural decline with aging (McCarthy, 2003) or healthcare cultures that overlook delirium can limit the complete recognition of delirium (Belanger & Ducharme, 2011). Furthermore, some nurses' subjective experiences about delirium assessment tools that require nurses' intuitive input, regardless of the results, can render them to be skeptical about delirium assessment (Zamoscik, Godbold, & Freeman, 2017).

Nurses are on the frontline of delirium care and thus for recognizing these momentary and subtle changes and detecting presymptoms because of their close and prolonged patient contact (Baker, Taggart, Nivens, & Tillman, 2015; Rice *et al.*, 2011). Yet, studies have focused merely on delirium scales or interventions, not on the subjectivity of nurses, which can influence delirium recognition.

For this reason, the authors see a need for knowing more about nurses' subjectivity, based on what is actually observed and assessed at the bedside. Accordingly, this study attempts to identify nurses' frames of reference about delirium detection in elderly patients and to promote an understanding of this phenomenon.

METHODS

Study design

In this study, Q-methodology was used to explore nurses' viewpoints about delirium detection in the elderly. Q-methodology, as an integrated research approach that combines the advantages of qualitative and quantitative methods, contributes to the description of complex topics by converting human subjectivity into an objective outcome (Simons, 2013; Watts & Stenner, 2005). Several researchers support the use of Q-methodology in the nursing discipline because it is useful for the development of evidence-based practice through a better understanding of the views of nurses or patients (Akhtar-Danesh, Baumann, & Cordingley,

2008; Cordingley, Webb, & Hillier, 1997; Gallagher & Porock, 2010).

This design, therefore, is applicable to exploring the structure of an individual's subjective decisions, such as nurses' delirium detection, because it contributes to an understanding of the unique perspectives that individuals in a particular group possess.

Practical steps of Q methodology

Q-methodology has six practical steps:

- 1 Develop a list of statements called the "Q-population" (the concourse) through various sources, such as pertinent literature and interviews.
- 2 Develop a final set of Q-statements called the "Q-sample" from the Q-population.
- 3 Select participants, known as the "P-sample," to sort the Q-sample.
- 4 Sort the Q-samples by using a "Q-sort table."
- 5 Factor analysis using the PQMethod program
- 6 Labeling and interpreting the factors (viewpoints) that have been identified.

The Q-population in this study was developed and refined from an integrated literature review and interviews. The authors conducted in-depth interviews with six nurses who were experienced in caring for patients with elderly delirium in general hospitals, geriatric hospitals, and nursing homes. Semistructured interview questions were used to minimize researcher bias. The questions asked were:

- 1 "Which symptoms do you detect delirium from?"
- 2 "What kind of experience do you have with delirium detection?"
- 3 "What do you think is most important in delirium detection?"
- 4 "What kind of personal know-how or procedures do you use for delirium detection?"

Research notes then were written up that recorded the atmosphere of the interview, the participants' appearance, impressions, and other factors immediately after the interviews and used them for Q-sample extraction.

A review of previous studies related to delirium and delirium detection also was conducted. Literature searches were carried out by using the keyword "delirium" alone and combined with search terms, such as "detection," "recognition," "screening," and "assessment." As the study was designed to take an inductive approach, the literature review was not extensive so as not to direct the results of the interviews. The literature

was integrated at a later stage and was developed as a Q-population.

Afterwards, a Q-population was extracted to properly reflect the participants' subjectivity about delirium detection and then refined it by using the reviewed literature referentially. As most of the participants commonly mentioned their own various intervention methods that were related to delirium detection during the interviews, the theme of "delirium intervention" was added. From this, 85 statements on seven themes (signs of delirium, strategies for delirium detection, delirium characteristics to consider, the main indicator of delirium, intervention strategies for delirium, the clinical meaning of delirium, and the discrimination of delirium from other conditions) were developed.

In this study, the Q-population was reconstructed through the categorization of similar statements; statements containing more than two ideas in a statement were separated and those containing repetitious viewpoints were eliminated. As a result, 34 Q-statements (Q-sample) represented the concourse (Table 1).

The convenience P-sample consisted of 32 nurses who were expected to best represent delirium detection in the elderly. The P-sample had experiences with elderly delirium care in the intensive care unit (ICU) and surgical units of general hospitals, geriatric hospitals, and nursing homes, in which the prevalence of delirium is reportedly relatively high.

Before conducting the Q-sort, information was provided about the research purpose, with instructions regarding the method of Q-sorting, and a consent form. Each of the 34 Q-statements was printed on a 5 cm × 6 cm-sized card with randomly assigned numbers on the upper part of the card. All the nurses were provided with a set of 34 Q-statement cards and a Q-sort table that contained 34 blank spaces that were configured as a forced quasinormal distribution. Each column of the Q-sort table had a numerical designation from "Most disagree" (−4) on the extreme left to "Most agree" (+4) on the extreme right (Table 2). The participants ranked and ordered their agreement with each Q-statement card according to their individual subjectivity and put the cards in the pyramid shape of the Q-sort table. This procedure was conducted on a table that was big enough for the participants to see all the cards in one look and reorder them if necessary.

First, they were asked to read each of the Q-statement cards and then divide them into three piles: "Agree," "Neutral," and "Disagree" (Paige & Morin, 2016; Watts & Stenner, 2005). Next, they were asked to select the second-, third-, and fourth-most agreed-with

Q-statement cards from the "Agree" piles and place them on the right side of the table in consecutive order. In succession, they were asked to do the same with the "Disagree" piles and place them on the left side of the table. After sorting, the participants finished the procedure by reconsidering whether they had sorted the cards according to their subjective priorities. Finally, through asking the participants why they had sorted the cards into the two extremes, additional information for further interpretation of the Q-factor was gathered.

Data analysis

The software program, PQMethod 2.35 (Schmolck, 2002), was used to conduct a principal components factor analysis and varimax rotation for analysis of the 32 individual Q-sorts.

As a result of the statistical analysis using the PQMethod, four discrete factors that represented a perspective that was shared by the included participants were extracted. For each discrete factor, its set of distinguishing statements and their average rankings from "Most disagree" (−4) to "Most agree" (+4) were reported. The characteristics of these factors were interpreted by using the factors that generated the most strongly agreed or disagreed Q-statements ($P < 0.05$); that is, distinguishing statements, with more focus on the ones that had a significantly lower P -value than 1%. Finally, each factor was assigned a descriptive label to represent the interpreted characteristics (Paige & Morin, 2016; Watts & Stenner, 2005).

Ethical considerations

The purpose of the study was explained to the participants, who were informed that participation was voluntary. All the study's participants completed the consent form after a complete explanation. The study was approved by the Institutional Review Board of the author's institution in advance and permission to conduct the research also was obtained from each hospital or facility.

RESULTS

In this study, the factor analysis revealed four discrete factors that accounted for 55% of the variance: 13, 10, 14, and 18%, respectively. The four factors were labeled "Prediction from the integrated signs," "Visible symptom-centered detection," "Detection of abnormal changes, based on concentrated observation," and "Identification relying on the diagnostic data."

Table 1 Factor arrays for the four factors

Q-statement	Factor			
	I	II	III	IV
Q1. The high-risk group for ED should be prevented from delirium due to the negative effect toward treatment	2**	−2**	0	0
Q2. It is important to always be open to the possibility of ED because ED can develop within minutes	2	4	4	2
Q3. When a change in physical status is accompanied by a cognitive change, I think it is ED	0**	−3	2**	−3
Q4. I focus on symptoms occurring at night because ED usually develops at night	2	2	−2	−4
Q5. ED develops easily in stressful situations (e.g. admission) due to elderly patients' lack of adaptability	4	4	0*	2*
Q6. Nurses who care for older patients need to know the high-risk group for ED, based on the literature	3	1	2	2
Q7. I carefully assess patients with presymptoms because ED can be best-managed by early detection and management	3**	−1	−1	1
Q8. ED tends to develop more often with depressed patients who are separated from their external environment	−1	−4**	−2	1**
Q9. Anxiety and restlessness are also symptoms of ED	0	−1	1**	−1
Q10. I start an assessment of ED when there is a visible symptom, such as improper behavior	0	0	−3**	0
Q11. It seems to be ED when the patient shows a silly smile for no reason or engages in repeated meaningless actions	−3**	0	1	0
Q12. I tend to recognize prolonged ED due to physical problems with relatively high priority	−1**	1	−2**	1
Q13. A subjective decision or instinct is not enough for the detection of ED, which should be judged accurately	0	−3**	−1	1
Q14. Communicating with a person close to the patient is helpful for grasping the patient's usual condition	4	3	4	3
Q15. Repetitive assessment through active listening and observation is effective for the detection of subtle changes in ED	3	0	0	3
Q16. Acute onset is the key for detection because the symptoms of ED do not gradually occur	1**	3**	−2**	−3**
Q17. ED is not habitual, but temporary	1	−1	0	−1
Q18. If there is a decrease in the patient's sense of reality, it can be regarded as ED	−2	2	3	−2
Q19. A patient who is hallucinating and talking nonsense can be considered to be experiencing ED	0**	3	3	3
Q20. Exhibiting decreased attention and concentration, the patient can be regarded as exhibiting ED	−3	−2	2**	−2
Q21. If a patient is orientated, it is not ED, despite talking nonsense	−2	2**	−4**	−2
Q22. Uncontrollable violent or aggressive behavior can be symptoms of ED	−1	2**	1*	0

Table 1 Continued

Q-statement	Factor			
	I	II	III	IV
Q23. ED patients tend to be talkative, with symptoms such as shouting, groaning, or muttering	1	0	–1	1
Q24. Despite talking nonsense, a patient who speaks evenly with clear eye contact may not be experiencing ED	–3	–2	–4	–4
Q25. A patient who feels threatened and rejects all treatments can be considered to be experiencing ED	–2	1**	–1**	–2
Q26. A change in behavior or characteristics, such as a quiet patient becoming chatty or a gentle patient turning aggressive, can be a symptom of ED	–1	–1	3**	0
Q27. A tendency to sleep with decreased reactions may be due to drug side-effects or other diseases, rather than ED	–1	1	–3**	–1
Q28. If a patient is more lethargic and reticent than usual, it can be due to ED	–4	–2	0	–1
Q29. It is effective to teach an old patient with delirium to become orientated and to explain what is happening when he or she talks nonsense	–4**	0	2*	–1
Q30. Listening to a patient's needs, discomfort, or why he or she is doing something and making them understand is important as an intervention	2*	–1**	0*	4**
Q31. Since the top priority is patient safety, a controlling intervention by medication or restraints is sometimes needed	1	0	1	4**
Q32. A dark and quiet atmosphere at night is helpful for maintaining sleeping patterns for older patients with delirium	1	1	1	0
Q33. Unusual behavior by a patient with dementia can be considered as a symptom of dementia, rather than an ED symptom	–2	–4	–3	–3
Q34. When confused with other illnesses, delirium can be diagnosed by tests that identify organic problems of the brain	0	–3**	–1	2**

ED, elderly delirium.

*Distinguishing at $P < 0.05$.**Distinguishing at $P < 0.01$.

Table 2 Sample of a completed Q-sort table

23									
			4	31	6				
		5	29	25	3	30			
	27	10	12	22	11	17	26		
	21	33	13	7	15	19	16	9	2
	24	32	34	8	1	28	14	20	18
Raw scores	–4	–3	–2	–1	0	+1	+2	+3	+4
No. of cards	2	3	4	5	6	5	4	3	2
	Strongly disagree			Neutral			Strongly agree		

The general characteristics of the P-sample and factor weights are presented in Table 3. Among the initial 32 P-samples, 27 loaded on the four factors as representative data. As per the Q-methodology procedure, the remaining five P-sample Q-sorts that did not load significantly on a factor were excluded from the results (Akhtar-Danesh *et al.*, 2008; Brown, 1980). As the purpose of Q-methodology is the identification of factors while placing no importance on the proportion of the factor, a standard requirement for factor selection is whether the factor is comprised of four-to-five participants with an Eigenvalue of >1 (Brown, 1980). An Eigenvalue >1 generally is accepted as safeguarding factor reliability, which allows it to be considered to possess significant statistical meaning and explanatory power (Watts & Stenner, 2005). Therefore, the factors that were revealed in this study were statistically significant because all four factors had Eigenvalues of >1: 9.95, 2.90, 2.72, and 2.10, respectively.

Across the four factors, the participants' characteristics, such as age, clinical setting, and clinical experience, were distributed evenly. The consensus Q-statements that showed statistically significant similarities across the factors were Q14, Q23, and Q32. Of the statements,

all factors agreed relatively strongly with Q14: "A person close to the patients" could be interpreted differently as family members, friends, or caregivers, but they all had in common that the person indicated that they knew the patient's normal condition and had the capability to recognize changes in that condition.

Factor I: Prediction from the integrated signs

Seven participants loaded on Factor I, which was composed of nine distinguishing statements. This group agreed on Q-statements 7, 1, 30, and 16, was neutral toward statements 19 and 3, and disagreed with statements 29, 11, and 12 (Table 1). The respondents with this view gathered information on every patient from various sources, such as a patient's history and physical examinations, and interpreted these signs to predict occurrences of delirium. They always kept delirium in mind, focusing on the identification of its presymptoms and risk factors.

They also watched their older patients with presymptoms more carefully and carried out preventive interventions. In particular, they used conversations with patients to assess delirium and, if necessary, to intervene. Examples include:

Table 3 Characteristics of the participants

Variable	Factor I (<i>n</i> = 7)	Factor II (<i>n</i> = 5)	Factor III (<i>n</i> = 7)	Factor IV (<i>n</i> = 8)
Sex				
Male	0	0	0	2
Female	7	5	7	6
Age range (years)	29–49	27–37	24–29	33–61
Married				
Yes	4	0	1	7
No	3	5	6	1
Education				
Associate's degree	0	0	0	2
Bachelor's degree	3	0	5	3
Master's degree or higher	4	5	2	3
Workplace				
Long-term care facility	4	0	0	4
Geriatric hospital	1	2	1	1
General ward	1	2	4	0
Intensive care unit	1	1	2	3
Work experience (years)	5–24	2–11	1–6	5–30
Position				
Registered nurse	5	2	4	4
Charge nurse	1	2	3	2
Head nurse	0	1	0	0
Nurse manager	1	0	0	2
Received delirium education				
Yes	5	3	2	5
No	2	2	5	3

“I assess every elderly patient in advance. If a patient fiddles with the i.v. line or sits up during the night looking around with anxious eyes ... then I watch them more carefully.”

“With massive transfusions or fluctuating vital signs at admission, the old patient is more likely to be delirious. I’m not 100% sure, but I think he may become delirious and so work to prevent that.”

“Through conversation, I can learn about their baseline emotional status and the severity of their symptoms if with delirium. Especially, I guess, even though nurses can’t orient delirious elders, we need to support them by conversation.”

Factor II: Visible symptom-centered detection

Five participants loaded on Factor II on the basis of nine Q-statements. This group agreed on Q-statements 16, 22, 21, and 25, but disagreed with statements 8, 13, 34, 1, and 30 (Table 1). The participants who loaded on Factor II detected delirium when they recognized a similar pattern, based on what they knew about delirium that shows a relatively acute onset with a visible pattern. Accordingly, they considered predicting such a condition difficult due to an acute occurrence of delirium and they also had a tendency to overlook relatively quiet symptoms, while focusing more on evident ones. Furthermore, they regarded that the prompt management of hyperactive delirium takes priority in delirium intervention, but said that it was difficult to make agitated delirious elderly patients understand the situation with just conversation. Examples include:

“The first signs [of delirium] I notice are disorientation, agitation, acting out, and a tendency to not sleep at night. Even when they look more enervated with a tendency to sleep than before, it’s not easy to link that with hypoactive delirium because the aged can be depressed basically.”

“In most cases, I take care of the acting-out patients only and assess the patients more at night when I guess delirium occurs more often.”

“Delirium has no presymptoms. It is not common, so it’s unpredictable. I don’t always think of it and assess it only once symptoms have started. I consider it an emergency situation.”

Factor III: Detection of abnormal changes, based on concentrated observation

Factor III was loaded by seven participants. This factor was composed of 14 Q-statements. This group agreed on Q-statements 26, 20, 29, 3, 9, and 22, was neutral

to statements 5 and 30, and disagreed with statements 21, 27, 10, 12, 16, and 25 (Table 1).

The participants who loaded on Factor III noticed whether a patient exhibited delirium or not based on the information they got from the concentrated observation of their elderly patients. They detected delirium when they found something that corresponded with their broad knowledge about the abnormal features of delirium.

According to their statements, the nurses fill a crucial role in the continuous and careful observation of patients, observation that is based on a wide range of knowledge about delirium symptoms that they have acquired from the literature and experience. They aim to prevent older patients’ safety problems with such careful observation. They emphasized the nurse’s role in assessing elderly patients for early detection and intervention because delirium assessment tools cannot be completely trusted. Examples include:

“Nurses are the ones who always stay close to patients, preventing them from abnormal behaviors. Nurses should assess them frequently because medications are temporary.”

“We always use the CAM-ICU [Confusion Assessment Method for the Intensive Care Unit], but most nurses say it’s not a 100% reliable tool. So, eventually we must observe them quite often, primarily for assessment of patients’ orientation.”

“Besides mixed, hypo, or hyperactive delirium, in real clinical situations, delirium occurs according to the subjects. Some appear only to clinicians but others maintain their alertness and become delirious only with their families.”

“The patterns of delirium reflect the patient’s original characteristics and sometimes vary with their previous occupations.”

“If something’s strange under observation, we catch it first. Next, we ask about orientation. Maintaining patient orientation in this way leads to improvement.”

“It’s important to assess delirium because of the problem of safety. Especially the falls and infection can occur when touching a wound or drainage.”

Factor IV: Identification by relying on the diagnostic data

The final factor was held by eight participants who shared six similarly ranked Q-statements. This group agreed on Q-statements 30, 31, 34, 5, and 8 but disagreed with statement 16 (Table 1).

The participants who loaded on Factor IV passively assessed delirium and recognized delirium by relying on

the results of diagnostic tests or doctors' diagnoses. They had confidence in intervening with delirious elderly patients, but thought that detection or screening was not the nurse's job or were difficult due to obstructions, such as work overload.

They used "delirium," "delusion," and "confusion" interchangeably and did not know that violence is one of the main symptoms of hyperactive delirium. They also did not consider that discriminating between delirium and dementia was important because intervention was the same for either condition. They believed that enlightening older patients in an early stage was the key to intervention, but focused on controlling intervention once it progressed. Examples include:

"We care for too many patients at the same time, so we don't especially assess delirium if it is not a case with already-diagnosed delirium."

"If it gets better with dementia medication, it's dementia. If not, it's maybe delirium. It's hard to distinguish them and should be determined by a psychiatrist's consult because the intervention is the same anyway."

"With aggressive or violent behavior, I don't regard it as delirium but as a behavioral and psychological symptom of dementia. I've never considered the tendency to sleep to be delirium, as well."

DISCUSSION

This study used Q-methodology to explore the subjectivity of nurses' detection of delirium in the elderly. As a result of the study, four unique perceptions about nurses' detection of the elderly's delirium were identified: prediction from the integrated signs, visible symptom-centered detection, detection of abnormal changes, based on concentrated observation, and identification by relying on the diagnostic data.

For delirium assessment, nurses receive various data from several sources in routine care, which enables them to recognize high-risk group members in advance and immediately notice newly developed or changed symptoms (Agar *et al.*, 2012). Thus, for better delirium care, nurses should comprehensively assess the patient by obtaining a patient's history, phase of disease, current pattern of symptoms, and temporal effects of medications (Hosie *et al.*, 2014a). Factor I also routinely collects and integrates various data and predicts delirium by interpreting those data. In this manner, Factor I recognizes the presymptoms of delirium, as well as those at high risk of delirium. Factor I emphasizes

managing older patients with presymptoms for the prevention of delirium.

Several previous studies pointed out that the early detection of delirium, as well as prevention, is crucial. The guidelines of England's National Institute for Health and Clinical Excellence stress applying a "Think delirium" atmosphere to daily nursing practice and keeping a close eye on patients, so as not to miss even a small change (National Clinical Guideline Center, 2010). Similarly, Factor III detects delirium symptoms based on closely observed patient details. Factor III assesses delirium by continuous observation on the basis of a broad knowledge of delirium symptoms (Barron & Holmes, 2013).

In some aspects, due to the relatively low specificity of delirium, detecting delirium based on patterns of broad delirium symptoms, rather than only on a single symptom, could be helpful (Hall, Meagher, & MacLulich, 2012). Factor II identifies delirium when there are relatively visible symptoms that are close to the patterns of typical delirium symptoms that are already in mind. Factor II independently recognizes the patterns of delirium as "visible symptoms with an acute onset," from the whole range of delirium symptoms and recognizes delirium only in such cases.

Previous research showed that some nurses, based on only a superficial understanding of delirium, tended to adopt a task-oriented approach to preventing bigger problems by placing more focus on intervention than on assessment (Agar *et al.*, 2012). Likewise, Factor IV assesses delirium in a passive way and recognizes delirium only after the diagnostic data are confirmed.

Even though it is known that early detection and prompt management are the key elements for delirium management, underrecognition of delirium is quite a common problem in clinical settings. Among the most common reasons for the failure of delirium recognition, hypoactive delirium and delirium superimposed on dementia were identified (Middle & Miklancie, 2015). Hypoactive delirium is easily underrecognized due to patients complaining less of discomfort and its less noticeable symptoms (Agar *et al.*, 2012; Huang *et al.*, 2012). Delirium superimposed on dementia often clouds the presentation of delirium and makes diagnosis difficult, as well. In addition, the failure to use the correct term, "delirium," can obstruct its recognition, even when delirious symptoms are observed (Hosie, Lobb, Agar, Davidson, & Phillips, 2014b).

Correspondingly, in this study, Factor II shows a tendency to overlook less visible symptoms like hypoactive delirium. Moreover, Factor IV has difficulties in

distinguishing delirium from dementia and also fails to conceptualize delirium, confusing it with other states, such as delusion, confusion, restlessness, or anxiety.

Several studies have shown that nurses' lack of delirium knowledge has a direct impact on delirium underrecognition and leads to less safe and effective care (Baker *et al.*, 2015; Steis & Fick, 2008). Thus, general delirium education for Factors II and IV is surely necessary. Furthermore, hypoactive delirium should be especially emphasized because the older patient commonly presents in the hypoactive form (Pitkala, Laurila, Strandberg, & Tilvis, 2005; Veiga *et al.*, 2012). In addition, it should be case-based education that can be used in real clinical settings, rather than textbook education. For example, delirium education for nursing homes, where the prevalence of dementia is relatively high, should include real cases of delirium superimposed on dementia for more practical application.

In this study, cases about delirium assessment and intervention that are not discussed in the literature were mentioned by the participants. Those participants who loaded on Factor III showed a wide range of empiric knowledge, such as about delirium related to patients' previous jobs or characteristics or about different delirium symptoms depending on the subject, and shared their knowledge with colleagues. The Factor I participants mentioned several presymptoms of delirium, such as irritability, especially right after an operation, untimely smiles, and the repetition of the same questions, as well as some other symptoms that correspond with previous studies. This kind of empirical knowledge, knowledge that nurses are sharing in their real practice, could be necessary for a more practice-oriented education.

In addition, education that is based on the strengths and weaknesses of each of the four factors that were revealed in this study could have clinical usefulness. For example, the key point of education regarding assessment or intervention for each factor could be different. Factor II considers delirium as "a disease that is unpreventable and untreatable with conversation." This could be related to clinical nurses' tendency to distrust what delirious older patients say and search for symptoms from what is shown, rather than what has been said (Belanger & Ducharme, 2011). However, in delirium care, including patients in their treatment, with an effort to make them understand, is also an important element that should be stressed in delirium education (Namba *et al.*, 2007), especially for Factor II.

Furthermore, delirium education that reflects nurses' subjectivity, based on the findings of this study, can be even more effective when combined with delirium

assessment tools. In fact, for more successful delirium detection, nursing education that is combined with a standardized delirium assessment tool is recommended (Middle & Miklancie, 2015). Even if delirium assessment tools often need nurses' own subjective evaluations, well-organized delirium education about the tools that reflect nurses' subjectivity will improve the detection and management of delirium.

In summary, this study revealed four factors about nurses' subjective perceptions regarding the recognition of delirium in older patients. It has not suggested that a certain factor was dominant, but rather that all of the delirium detection factors were important, so they should be used in combination to provide better care. In other words, a nurse can successfully detect delirium when using all the methods that were revealed by the four factors.

CONCLUSION

In this study, Q-methodology was applied in order to identify nurses' subjectivity about elderly delirium detection. The results of the study can help to improve the practical understanding of the detection of older patients' delirium from nurses' points of view. These results are expected to be used as the basis of a more practical and accessible delirium education for nurses that reflects the nurses' subjective viewpoints, as described by the four factors. At the same time, it can be used for selecting the contents and methods of delirium education by focusing on the strengths and weaknesses of each factor so that it is possible to contribute to more effective delirium care and related practices.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

E. J. and S. O. C. both were involved in the study's design, data collection and analysis, and manuscript preparation.

REFERENCES

- Agar, M., Draper, B., Phillips, P. A., Phillips, J., Collier, A., Harlum, J. *et al.* (2012). Making decisions about delirium: A qualitative comparison of decision making between nurses working in palliative care, aged care, aged care psychiatry, and oncology. *Palliative Medicine*, 26, 887–896.
- Akhtar-Danesh, N., Baumann, A. & Cordingley, L. (2008). Q-Methodology in nursing research a promising method for the study of subjectivity. *Western Journal of Nursing Research*, 30, 759–773.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th edn). Arlington, VA: American Psychiatric Publishing.
- Baker, N. D., Taggart, H. M., Nivens, A. & Tillman, P. (2015). Delirium: Why are nurses confused? *MEDSURG Nursing*, 24, 15–22.
- Barron, E. A. & Holmes, J. (2013). Delirium within the emergency care setting, occurrence and detection: A systematic review. *Emergency Medicine Journal*, 30, 263–268.
- Belanger, L. & Ducharme, F. (2011). Patients' and nurses' experiences of delirium: A review of qualitative studies. *Nursing in Critical Care*, 16, 303–315.
- Boockvar, K., Signor, D., Ramaswamy, R. & Hung, W. (2013). Delirium during acute illness in nursing home residents. *Journal of the American Medical Directors Association*, 14, 656–660.
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.
- Cordingley, L., Webb, C. & Hillier, V. (1997). Q methodology. *Nurse Researcher*, 4, 31–45.
- Fong, T. G., Jones, R. N., Shi, P., Marcantonio, E. R., Yap, L., Rudolph, J. L. *et al.* (2009). Delirium accelerates cognitive decline in Alzheimer disease. *Neurology*, 72, 1570–1575.
- Gallagher, K. & Porock, D. (2010). The use of interviews in Q methodology: Card content analysis. *Nursing Research*, 59, 295–300.
- Hall, R. J., Meagher, D. J. & MacLulich, A. M. (2012). Delirium detection and monitoring outside the ICU. *Best Practice & Research: Clinical Anaesthesiology*, 26, 367–383.
- Hosie, A., Agar, M., Lobb, E., Davidson, P. M. & Phillips, J. (2014a). Palliative care nurses' recognition and assessment of patients with delirium symptoms: A qualitative study using critical incident technique. *International Journal of Nursing Studies*, 51, 1353–1365.
- Hosie, A., Lobb, E., Agar, M., Davidson, P. M. & Phillips, J. (2014b). Identifying the barriers and enablers to palliative care nurses' recognition and assessment of delirium symptoms: A qualitative study. *Journal of Pain and Symptom Management*, 48, 815–830.
- Huang, L. W., Inouye, S. K., Jones, R. N., Fong, T. G., Rudolph, J. L., O'Connor, M. G. *et al.* (2012). Identifying indicators of important diagnostic features of delirium. *Journal of the American Geriatrics Society*, 60, 1044–1050.
- Inouye, S. K., Westendorp, R. G. & Saczynski, J. S. (2014). Delirium in elderly people. *The Lancet*, 383, 911–922.
- McCarthy, M. C. (2003). Detecting acute confusion in older adults: Comparing clinical reasoning of nurses working in acute, long-term, and community health care environments. *Research in Nursing and Health*, 26, 203–212.
- Malik, A., Harlan, T. & Cobb, J. (2016). Stop. Think. Delirium! A quality improvement initiative to explore utilising a validated cognitive assessment tool in the acute inpatient medical setting to detect delirium and prompt early intervention. *Journal of Clinical Nursing*, 25, 3400–3408.
- Middle, B. & Miklancie, M. (2015). Strategies to improve nurse knowledge of delirium: A call to the adult-gerontology clinical nurse specialist. *Clinical Nurse Specialist*, 29, 218–229.
- Namba, M., Morita, T., Imura, C., Kiyohara, E., Ishikawa, S. & Hirai, K. (2007). Terminal delirium: Families' experience. *Palliative Medicine*, 21, 587–594.
- National Clinical Guideline Center. (2010). *Delirium: Diagnosis, Prevention and Management*. London: Royal College of Physicians (UK).
- O'Mahony, R., Murthy, L., Akunne, A. & Young, J. (2011). Synopsis of the National Institute for Health and Clinical Excellence guideline for prevention of delirium. *Annals of Internal Medicine*, 154, 746–751.
- Paige, J. B. & Morin, K. H. (2016). Q-Sample construction: A critical step for a Q-methodological study. *Western Journal of Nursing Research*, 38, 96–110.
- Pitkala, K. H., Laurila, J. V., Strandberg, T. E. & Tilvis, R. S. (2005). Prognostic significance of delirium in frail older people. *Dementia and Geriatric Cognitive Disorders*, 19, 158–163.
- Rice, K. L., Bennett, M., Gomez, M., Theall, K. P., Knight, M. & Foreman, M. D. (2011). Nurses' recognition of delirium in the hospitalized older adult. *Clinical Nurse Specialist*, 25, 299–311.
- de Rooij, S. E., Schuurmans, M. J., van der Mast, R. C. & Levi, M. (2005). Clinical subtypes of delirium and their relevance for daily clinical practice: A systematic review. *International Journal of Geriatric Psychiatry*, 20, 609–615.
- Schmolck, P. (2002). *PQMethod 2.35*. [Cited 16 Oct 2014.] Available from URL: <http://schmolck.userweb.mwn.de/qmethod/downpqwin.html>
- Simons, J. (2013). An introduction to Q methodology. *Nurse Researcher*, 20, 28–32.
- Steis, M. R. & Fick, D. M. (2008). Are nurses recognizing delirium? A systematic review. *Journal of Gerontological Nursing*, 34, 40–48.
- Veiga, D., Luis, C., Parente, D., Fernandes, V., Botelho, M., Santos, P. *et al.* (2012). Postoperative delirium in intensive care patients: Risk factors and outcome. *Revista Brasileira de Anestesiologia*, 62, 469–483.

- Watts, S. & Stenner, P. (2005). The subjective experience of partnership love: A Q methodological study. *British Journal of Social Psychology*, 44 (Pt 1), 85–107.
- Witlox, J., Eurelings, L. S., de Jonghe, J. F., Kalisvaart, K. J., Eikelenboom, P. & van Gool, W. A. (2010). Delirium in elderly patients and the risk of postdischarge mortality, institutionalization, and dementia: A meta-analysis. *JAMA*, 304, 443–451.
- Wong, C. L., Holroyd-Leduc, J., Simel, D. L. & Straus, S. E. (2010). Does this patient have delirium?: Value of bedside instruments. *JAMA*, 304, 779–786.
- Zamoscik, K., Godbold, R. & Freeman, P. (2017). Intensive care nurses' experiences and perceptions of delirium and delirium care. *Intensive Critical Care Nursing*, 40, 94–100. doi:10.1016/j.iccn.2017.01.003