Nurse Education in Practice 35 (2019) 48–54

Contents lists available at ScienceDirect

Nurse Education in Practice

journal homepage: www.elsevier.com/locate/nepr

Clinical education

Using the case method to explore characteristics of the clinical reasoning process among ambulance nurse students and professionals

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ARTICLE INFO

Keywords:
Ambulance nurse
Case-method
Clinical reasoning
Facet theory
Nurse education

ABSTRACT

Clinical reasoning is proposed to represent cognitive processes, skills and decision-making aspects of nursing practice and is important for quality care. It has been suggested that the reasoning processes should be practiced during education to develop decision-making competence among nurses. The aim of the study was to explore and describe clinical reasoning processes at different times during specialist ambulance nurse education and among specialist ambulance nurses.

Nurses were invited to participate: at initiation of specialist education (n = 19) and during the final weeks of specialist education (n = 17). We also invited nurses employed in ambulance service (n = 13). At each session a written case was presented for small group discussions. Discussions were recorded and transcribed. A mapping sentence was used to analyse the meaning units of the text capturing different elements of clinical reasoning. For interpretation of data the results were then plotted in a three-dimensional diagram.

Professional experiences and reflectivity seemed to influence both the content and the process of clinical reasoning. At initiation of specialist education, more analytical reasoning was used, while the specialist nurses mainly used a non-analytical approach. Specialist nurses incorporated a larger variety of content during their reasoning. Based on the findings here, the case-method might be useful for practicing various clinical reasoning skills and elaborating on decision-making processes.

1. Background

Specialist nurse education aims to prepare for a more advanced professional practice. Advancement may include efficient communication and collaboration with application of enhanced individual competence in the decision-making processes. Clinical reasoning is considered to represent cognitive processes, skills and decision-making aspects of nursing practice and is referred to as an important factor for providing quality care (Higgs, 2008; Levett-Jones et al., 2010). This model of clinical reasoning process comprises: consider patient situation, collect cues, process information, establish goals, take action, evaluate and reflect (Levett-Jones et al., 2010). The process can be described as a reflection of the thought processes in clinical work for nurses, and is often used as a tool for quality enhancement and learning within a profession (Higgs, 2008). The clinical reasoning process is believed to strengthen professional competence by raising personal awareness of knowledge, skills, actions and attitudes (Higgs, 2008). The clinical reasoning model chosen for use in this study was primarily developed for educational purposes to be utilised among nursing students or professionals to enhance patient safety and quality of care (Levett-Jones et al., 2010).

How the clinical reasoning process is applied in advanced practice varies and clinical experience influences the reasoning processes. The more experienced nurses collect more cues than the novice nurses (Hoffman et al., 2009) and use this diversity of cues for a holistic analysis of the patient situation (Banning, 2008). It is suggested that more experienced professionals use a non-analytic approach to reasoning more than analytic (Eva, 2005). This dual process is sometimes described as type 1- or type 2-reasoning, where the non-analytical type 1-reasoning is considered to be intuitive, direct, fast, effortless and sometimes uses pattern recognition while the analytical type 2-reasoning process is described as cognitive, controlled and reflective (Durning et al., 2015; Eva, 2005; Higgs, 2008; Marcum, 2012; Norman et al., 2016). It has been argued that the use of non-analytical processes normally does not negatively influence the quality of decisions, even when the situation is considered complex (Durning et al., 2015;

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https://doi.org/10.1016/j.nepr.2019.01.001
Received 25 October 2017; Received in revised form 30 December 2018; Accepted 8 January 2019

Norman et al., 2016). The non-analytical reasoning approach is considered to evolve foremost by further clinical experience (Eva, 2005; Levett-Jones et al., 2010; Marcum, 2012). The ability to alter, when needed, between the more thorough analytical process and the non-analytical process of reasoning appears to represent an expert nurse. (Benner, 1982; Durning et al., 2015; Marcum, 2012; Norman et al., 2016).

On all levels of health education, practicing clinical reasoning skills most likely enhances good clinical practice (Henderson, 2002) and provides a good foundation for safe and qualitative patient care. Various efforts have been made to make use of the clinical reasoning process for educational purposes (Forsberg et al., 2014; Higgs, 2008; Levett-Jones et al., 2010), all enhancing the notion of accuracy and strengthening each model's validity. One of the sought after benefits of using a clinical reasoning model is to practice cognitive and metacognitive processes. The implication of this among students and professionals is appealing but the development of adequate research methods to capture the reasoning process has so far been challenging (Banning, 2008). Researchers have often used a think-aloud protocol (Banning, 2008; Hoffman et al., 2009; Lee et al., 2016) or different forms of written data (Tan et al., 2010). Experiences from think-aloud studies (Lee et al., 2016) conclude the need of a more reflective approach to data collection including real life experiences or reflective practice procedures (Goudreau et al., 2015). Other methodological approaches such as analysing clinical group discussions (Andersson et al., 2012) or observational studies may promote understanding of clinical reasoning skills.

Knowledge and understanding of clinical reasoning processes are considered valuable for elaborating the nursing profession as well as enhancing quality of nursing care among professional nurses (Lee et al., 2016). The clinical reasoning model (Levett-Jones, 2010) used in this study was chosen specifically for its properties of linking theoretical knowledge to practice (Hunter and Arthur, 2016). To create a specific program for clinical reasoning skills development, a competency-based approach including the perspectives of graduated nurses can be of great value (Goudreau et al., 2015). Hence, a foundation for an educational intervention would benefit from a definition of specific characteristics of clinical reasoning, including contextual and experiential aspects.

The aim of the study was to explore and describe the clinical reasoning processes at different levels of education and clinical experience among specialist ambulance nurse students and professional specialist ambulance nurses.

Specific study question:

- What similarities, differences and characteristics of clinical reasoning are found among groups of specialist ambulance nurse students and professional specialist ambulance nurses?

2. Methods

This study used a qualitative approach to explore and describe the clinical reasoning process among groups of students and professionals. Data was generated by audio recordings of groups reasoning about a case. The data was analysed using a mapping sentence (Fig. 2) (Hackett, 2014) following the facet theory analysis (Dancer, 1990; Guttman and Greenbaum, 1998; Hackett, 2014; Shye et al., 1994). The use of a mapping sentence offers a possibility to derive and analyse qualitative data, such as complex human behaviour, by identifying and structuring content and relationships (Hackett, 2014, 2016; Shye et al., 1994).

2.1. Context

In Sweden, following national legislation, every ambulance is staffed with an RN and some regional health care providers require a registered nurse (RN) with specialist ambulance nurse education. The specialist ambulance nurse education is a specialist programme that consists of one year (40 weeks) of full time studies including clinical practice. The students are all RNs prior to admission. The students have various levels of clinical experience of nursing and ambulance care.

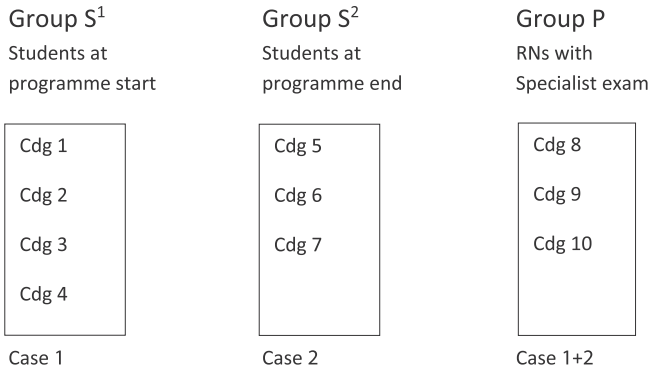

Fig. 1. Study overview.
The participants formed three groups (Group S^1, S^2 and P). Each group of participants was divided into several Case discussion groups (Cdg) with 4–7 participants in each group. Group S^1 were students at the beginning of the program. Group S^2 were students from the same student cohort but during their final week of education. Group P were specialist nurses. To avoid replicating discussions Case 1 was discussed by Cdg 1–4 (Group S^1), Case 2 by Cdg 5–6 (Group $S^{2)}$ and both cased were discussed by Cdg 8–10 (Group P).

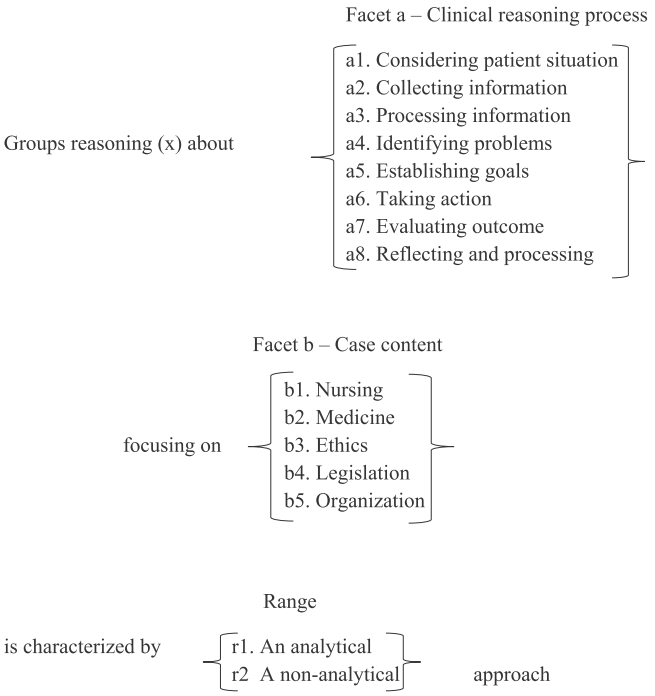

Fig. 2. The mapping sentence used to explore the characteristics of the clinical reasoning process.

2.2. Participants

All participants attended, or had previously attended, the specialist ambulance nurse education programme at Lund University, Sweden. The participants were RNs with different professional experiences prior to programme admission (Table 1). Participants were invited by the first author: nineteen students (S) in the first weeks of their programme agreed to participate in the study (Table 1).

The students were divided into four case discussion groups (Group S1, Fig. 1). The same students were again invited in the final week of the programme. Two of the students could not participate and the

Table 1
Demographics of the study participants.

	*Group S[1]**	*Group S[2]**	*Group P **
Age *Median (Min-Max)*	28 (24–35)	28 (25–36)	38 (31–50)
Participants *n (Female/Male)*	19 (14/ 5)	17 (13/4)	13 (6/ 7)
RN experience *Years, Median (Min-Max)*	3 (1.5–8)	4 (2,5–9)	11 (6–23)
Ambulance experience *Years, Median (Min-Max)*	0 (0–2)	1 (0–3)	5 (3.5–16)
Academic degre *Bachelor/Master*	19/0	17/0	6/7

*Groups S^1 and S^2 represent the same cohort of students at the beginning and end of education.
Group P participants were all working as ambulance nurses, holding a specialist nursing degree.

remaining were divided into three case discussion groups (Group S2). The specialist ambulance nurses (thirteen) were recruited to represent experienced professionals (P) having a specialist ambulance nurse exam and current employment as specialist ambulance nurses, (Group P) and formed three case discussion groups.

2.3. Data collection

The study was conducted during 2015–2016. Groups of participants were presented a written case to discuss. The case scenarios used in the study were written as narrative stories, and followed the pedagogical principles of the Harvard case-method (Kim et al., 2006; Mauffette-Leenders et al., 2005). The case-method is described as an active learning method for bridging the gap between theoretical education and professional practice. The learners are presented to a professionally appropriate case and discuss areas of high professional validity in a systematic way. The possibility to take part in theoretical discussions from a professional's perspective is considered to support the possibility of comprehensive learning of a specific profession (Kim et al., 2006; Mauffette-Leenders et al., 2005). All participants were familiar with the method since it is used at the nursing programmes for integration of theory and practice (Crang-Svalenius and Stjernquist, 2005). Two case scenarios representing clinical work in the ambulance service were created by the first author (Case 1 and 2). To avoid replicating the discussions among the student groups, one case was used at the first session (group S1) and the second case at the end of the education (group S2). Group P discussed both cases (Fig. 1). Both cases were designed to incorporate a wide array of content, giving possibilities of various foci and multiple dimensions in group discussions (Kim et al., 2006). A case-method template was used to facilitate and scaffold the discussions and included headings as; facts, problems, analysis, action, predictions and outcome. Each session was facilitated by the last author to make sure the discussion was related to the case and to interfere only if the group asked for assistance. An observer was present at each session with the primary purpose of observing group dynamics. Neither the facilitator nor the observer had met the participants ahead of the discussions or were involved in the specialist nursing programme. A protocol was used to summarise session observations for each group, including group engagement and dynamics, verbal and non-verbal communication and group interactivity. The group discussion sessions were audio recorded, timed in minutes and transcribed verbatim to be used for analysis.

2.4. Analysis

The analysis was based on the transcribed texts from case discussions using a mapping sentence (Fig. 2). The mapping sentence reflects the research design and is created to process content of research findings (Hackett, 2014, 2016) in accordance with the study aim. A mapping sentence consists of a number of facets created both theoretically and empirically to give a multidimensional presentation of qualitative content.

Each item of data, consisting of a qualitative content unit, was passed through the mapping sentence. In this process, the qualitative

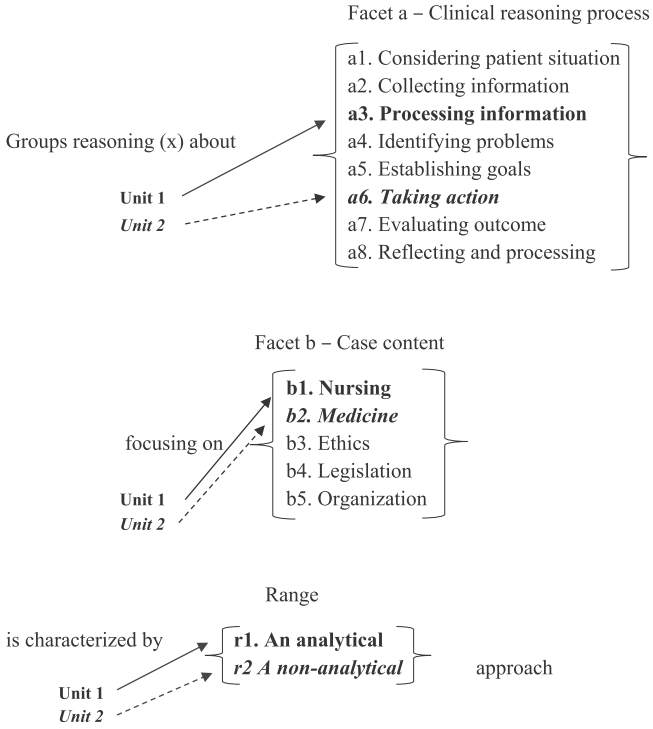

Fig. 3. Two examples of the use of the mapping sentence.
Each reasoning unit is assessed and allocated to one facet element in each facet and one of the two range options. By this, a so called structuple is formed by transforming the qualitative date to numerical values. The structuple represents a numerical presentation of the results of analysis of data and is used in the reporting of results.

content items of data were transferred to numerical values called structuples. Each unit (x) was used as subject in the mapping sentence (Fig. 3) including two facets and a range divider (Hackett, 2014) to sort the material into a specific set of structuples (Shye et al., 1994) for each group. Both facets used in this study are modular facets, reflecting the participants' understanding, knowledge and focus of reasoning.

Facet a - The clinical reasoning process, was created from the principles of the clinical reasoning process (Levett-Jones et al., 2010). The elements of the facet were derived directly from the clinical reasoning process model to sort reasoning units in relation to an accurate clinical process, revealing what part of the process the group mainly reasoned about.

Facet b - Case content, sorted the reasoning units in accordance with reasoning content. All 5 facet elements represented aspects of nursing care clinical settings. The nursing facet element (b1) represented central aspects of nursing (Ekman et al., 2011; Henderson, 1991) such as communication, relationships and environmental considerations representing a holistic nursing approach. Element b2 (medicine) content represented physical status, pathophysiology, pharmaceutical treatment or diagnoses. Elements b3-b5 represented ethics, legislation and

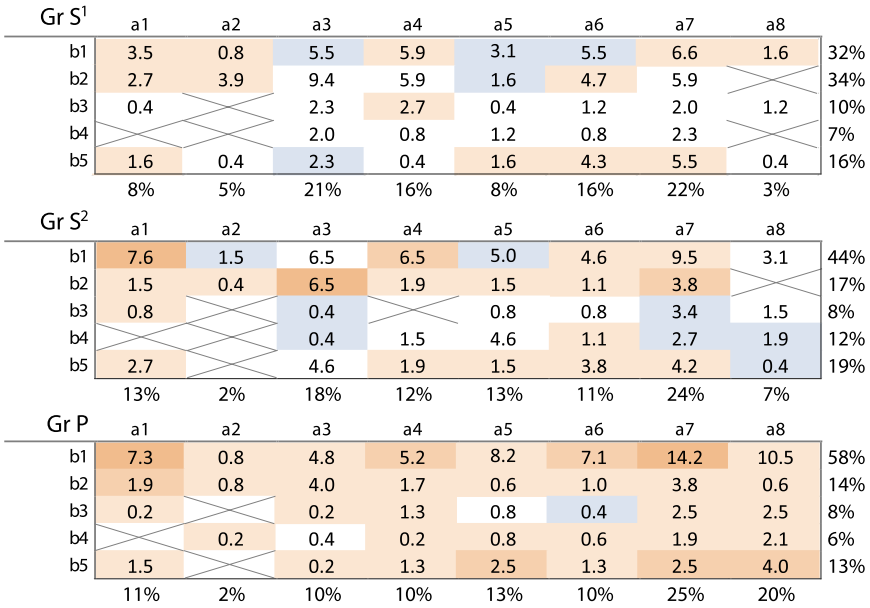

Fig. 4. Mapping results.
The distribution of frequencies of reasoning units (%) for groups S1, S2 and P are shown. Facet elements a1-a8 and b1-b5 were derived from the mapping sentence (Fig. 2) to form the grid outline. Absence of reasoning units appears as cells with a grey cross. The total percentage for each facet element appears in bold at the bottom (facets a) and to the right of each group's grid (facets b). The blue colour represents a positive range difference and orange a negative range difference, indicating if an analytical (positive range difference) or non-analytical reasoning (negative range difference) occurred most frequently. Tree levels of colour intensity were used to categorize the range difference into small (level 1), moderate (level 2) or pronounced (level 3). Uncoloured cells represent no difference (0) between r1-r2 reasoning units. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

organisation, respectively.

The range allocated each unit of reasoning into analytical or non-analytical reasoning based on the depth and use of recalled knowledge or experiences in the groups' discussions. The definition of range was based on descriptions of clinical reasoning (Durning et al., 2015; Eva, 2005; Marcum, 2012). By analysing each group's reasoning, using the mapping sentence, a specific set of structuples emerged. The structuples within each main group (S1, S2 and P) were then explored with three-dimensional descriptive statistics.

To illustrate the findings a three-dimensional figure was created, where the number in a cell represents the frequency of occurrence of each combination of facets a and b, and the colour represents frequency difference within the range (Fig. 4). The blue colour represents a positive range difference and orange a negative range difference, indicating if an analytical (positive range difference) or non-analytical reasoning (negative range difference) occurred most frequently. Uncoloured cells represent no difference (0) in frequency of range units. Three levels of colour intensity were used to categorize the range difference into small (level 1), moderate (level 2) or pronounced (level 3). To adjust for the different total number of reasoning units (where group P had approximately a double amount of reasoning units since that group discussed both cases) the group P increments were doubled compared to groups S1 and S2. Groups S1 and S2 levels were set to: small: 1–5 reasoning units; moderate: 6–10; pronounced: > 11 units. Group P levels were set to: small: 1–10 reasoning units; moderate: 11–20; pronounced: > 21 units. The final step of the analysis was an interpretation of group characteristics, similarities and differences.

3. Results

All groups reasoned about the case scenarios in ways that could be mapped using the mapping sentence and different patterns were identified. Group S1 altered between analytical and non-analytical reasoning regardless of content or process throughout their reasoning process (Fig. 4) indicated by the small variation in range levels (shown by the colour). A moderate shift to an analytical approach was found when the group reasoned about nursing and medicine (facets b1 and b2) which also represented a major part of their reasoning. The focus on medicine and nursing (facets b2 and b1) and less on ethics and legislation (facets b3 and b4) content are visible. A low frequency of the group's reasoning was about collecting information (facet a2) and almost no reflection and processing (facet a8) units were found. Also in group S2 a pattern of both analytical and non-analytical reasoning was found. This variation of analytical and non-analytical reasoning is seen in nursing (facet b1) which also held the majority of the group's content reasoning frequency. The group reasoned to a large extent about organisation (facet b5) and medicine (facet b2) but only to a small extent about legislation (facet b4). The group reasoned about all elements (facet a), but very low frequencies of reasoning about collecting information (facet a2), reflecting and processing (facet a8) were found.

Group P predominantly used a non-analytical approach during their reasoning. However, the mostly small range differences indicate the presence also of analytical reasoning within each facet. The group's non-analytical approach was especially pronounced when reasoning about evaluation of nursing (facets b1 + a7). Ethics and legislation (facets b3 and b4) were the least discussed content. Collecting information (facet a2) showed a low frequency compared to the other parts of the reasoning process (facet a) where evaluation (facet a7), reflecting and processing (facet a8) showed high frequencies.

Groups S1 and S2 both displayed a pattern of variation between analytical and non-analytical reasoning while group P predominantly used a non-analytical approach. All three groups focussed least on collecting information (facet a2) and most on evaluation (facet a7) compared with other parts of the clinical reasoning process. Group P was the only group to reason largely about the reflecting and processing parts of the process (facet a8). The student groups processed information (facet a3) to a larger extent than group P, mainly applying analytical reasoning. A large part of all groups' reasoning content was about nursing (facet b1) and less about ethics and legislation (facets b3 and b4). Group S1 focussed more on medical content (facet b2) than the other groups. Group P focussed a majority of their reasoning on nursing and less on medicine, in a consistent non-analytical way. Group P covered more facet combinations than the other groups, including almost all parts of content and process (facets a and b).

The group discussions varied between 25 and 79 min per case although holding approximately the same number of structuples. The mean time spent per case discussion was 66 min for Group S1, 42 min for Group S2 and 37 min for Group P. The observations showed that all groups displayed an open discussion climate, characterised by active listening and no interruptions. All participants were active in the discussions. Only at very few occasions did the groups interact with the facilitator, mainly to clarify session settings.

4. Discussion

The two groups including students as participants displayed similar characteristics of clinical reasoning in this study. This could be influenced by programme prerequisites since all participants were RN's with at least a year of clinical experience prior to programme start. The participant had RN experience but some lacked the specific clinical experience from ambulance services, and they demonstrated more use of analytical reasoning, in agreement with previous findings (Higgs, 2008). The groups' analytical approach could originate from less professional experiences. As suggested by Johnsen et al. (2016), students seemed to use an analytical reasoning process with a reactive approach rather than a proactive and directed approach when collecting cues (Johnsen et al., 2016). The clinical reasoning process among less experienced professionals tends to be analytical (Banning, 2008; Eva, 2005; Higgs, 2008; Hoffman et al., 2009), showing usefulness of the analytical approach when learning new clinical skills. Demands on professional knowledge, skills and the complexity of health care increases the need for efficient reasoning (Banning, 2008; Hoffman et al., 2009). The larger focus on medical content among the students reflects the demands of knowledge in the ambulance nurse profession, as expressed by the professionals themselves (Wihlborg et al., 2014). The ambulance service context holds specific holistic challenges while the specialist ambulance nurse curriculum, professional guidelines and protocols, largely focus on medicine (Sjolin et al., 2015; Sundstrom and Dahlberg, 2011) instead of the holistic nursing perspective. Being new in a profession, uncertainty could be addressed by focussing on professional guidelines, which was displayed in the students' discussions.

The professional group mainly used a non-analytical approach, in agreement with previous research using other methodologies (Banning, 2008; Eva, 2005; Higgs, 2008; Levett-Jones et al., 2010; Marcum, 2012) but signs of expert knowledge (Benner, 1982) could be found as they used their clinical experience to improve accuracy of their reasoning. Their reasoning showed signs of constant evaluation of strategy, based on fast and compressed assessment of current case information and judging the needs of analytical reasoning. The professional group displayed the experts' abilities to alternate between analytical and non-analytical reasoning and choose the most appropriate way to reason with regard to given information in agreement with previous findings (Durning et al., 2015; Marcum, 2012). This is also in alignment with previous research proposing that a non-analytical way of reasoning can be more efficient, saving time by speeding up the process (Durning et al., 2015; Eva, 2005; Higgs, 2008). The professionals also seemed to use their clinical experience to form a directed reasoning approach which effectively lead them to the proposed actions and goal establishment (Johnsen et al., 2016; Levett-Jones et al., 2010). Given the complex nature of a professional environment, the more proactive approach (Johnsen et al., 2016) probably mirrors their clinical experiences. The larger focus on the reflective and processing parts of the clinical reasoning process, compared with the student groups, could be considered an example of useful experiential knowledge (Jarvis, 2010; Yardley et al., 2012) where professional experiences are utilised in analysis of new situations. The professional group largely shifted the main focus of reasoning from medicine to nursing, perhaps also as a result of their professional experiences, reflecting the demands of the ambulance services (Sundstrom and Dahlberg, 2011; Wihlborg et al., 2017) and striving for quality care. The lesser focus on medicine should not be interpreted as lack of content knowledge but rather as an expression of the guideline-driven health care services where medical content is largely governed by detailed instruction, giving less room for variation of interpretation. (Sundstrom and Dahlberg, 2011). The absence of protocol or guidelines for the holistic perspective in ambulance care opens up for enhanced discussions in the professional group, as their professional experiences (Wihlborg et al., 2017) can help to identify the need for alternative perspectives on a clinical situation.

The case-method appeared to create opportunities to practice reasoning through all parts of the clinical reasoning process, strengthening the validity of the method for advanced level nursing education. To create opportunities for students to practice clinical reasoning is considered to enhance meaningful learning and eventually positively influence professional competence (Higgs, 2008; Levett-Jones et al., 2010). The groups here reasoned less about collecting cues (facet a2), possibly due to their insight that the facilitator was not a nurse and could not provide any more information than what was available in the narrative. This absence of group reasoning about additional cues could also be a product of case design and could be addressed by alternative case designs (Kim et al., 2006). In this study we found that the complexity of clinical situations can be effectively transferred into cases, giving the participants the opportunity to reflect on clinical practice in an academic setting (Kim et al., 2006; Mauffette-Leenders et al., 2005). The two cases used in this study were considered to be comparable in complexity and the interpretation of results was assessed to not be dependent on case specificity. For quality assessment of the analysis, three of the authors independently analysed some of the case discussions of group P and discussed to reach agreement on interpretation. We also compared our interpretations across the groups to ensure that the analysis was not biased by case specificity (Mauffette-Leenders et al., 2005). Exploring the clinical reasoning process using the case-method with small group discussion seems to be comparable to think-aloud studies (Durning et al., 2015; Higgs, 2008; Hoffman et al., 2009; Johnsen et al., 2016) regarding the possibility to provide participants with challenging and useful simulated clinical settings. Both methods probably have weaknesses due to their clinical artificiality but they can still be considered useful (Eva, 2005; Higgs, 2008; Johnsen et al., 2016; Norman et al., 2016).

Facet theory analysis and especially the mapping sentence is widely used for research in psychology and social sciences and more rarely seen in nursing, even though it could be an efficient way of analysing qualitative data (Guttman and Greenbaum, 1998; Hackett, 2014; Limor and Levy, 1992). In this study, we used the mapping sentence as a utility for providing the researchers with a structured way to arrange and visualise complex data (Hackett, 2016). Credibility and trustworthiness of results (Guba, 1981) were maintained by the negotiation of criteria for identifying units of reasoning and the continuous discussions of results among the researchers. The data collected through observations in a setting of group discussions reflected the actual practice of the participants hence strengthening study credibility. The dependability of the results was strengthened by the contextualisation of the mapping sentence. An important part were the authors' selection and negotiation of the units of analysis where the collective work and continuous re-examination of data and methodology increase dependability. The transferability of results depend on the clinical and educational context, giving the results meaning in any similar context. The transferability of this study's results is largely dependent on the specific organisational context since, in this setting, ambulance nurses make up a large part of the ambulance organisation. There are increased possibilities to make use of study results in any other context that holds a majority of independent health professionals.

Although the facet theory tradition (Guttman and Greenbaum, 1998; Shye et al., 1994) is associated with advanced statistical methods of analysis and visualisation such as multi-dimensional scaling (MDS) or smallest space analysis (SSA), varied methods of reporting results have developed over time (Hackett, 2014) and the use of the mapping sentence as a tool for data collection is recognised (Hackett, 2014, 2016). In this study, the use of the mapping sentence was followed by the development of a purposeful descriptive analysis to visualise the complex data (Fig. 3), where all three dimensions of data were made visible for interpretation.

Our results support the use of the case-method for practicing professional clinical reasoning skills. The students' clinical reasoning skills are most likely best developed by the repetitive use of reflections on the clinical reasoning process on individual and group level (Eva, 2005;

Higgs, 2008), which may be well suited as a final part of the case discussions. Individual learning of clinical reasoning skills has been proposed to occur through making personal experiences and reflecting upon them (Levett-Jones et al., 2010). Students and professionals alike should benefit from learning to distinguish and utilise analytical and non-analytical clinical reasoning since both methods are useful in clinical practice. Clinical reasoning skills are expected to develop during a plethora of educational strategies such as clinical placements, simulation exercises, theoretical cases, communication with standardised patients, professional supervision or clinical reflections. The use of the case-method may also be considered to enhance and develop professional competence (Dall'Alba and Sandberg, 2006; Jarvis, 2010). Students' awareness and elaboration on cognitive strategies, such as the use of clinical reasoning may better prepare students for ambulance care.

5. Conclusion

Professional experiences and reflectivity seemed to influence both the content and the process of the clinical reasoning during case discussions. The professionally less experienced students used an analytical approach through the clinical reasoning process, while the specialist nurses mainly used a non-analytical approach. The case-method was found to be useful for practicing clinical reasoning skills among both students and professionals. To practice the clinical reasoning model during education could possibly lead to strengthened professional competence.

6. Ethical considerations

According to the Swedish legislation regulating research ethics this study was not subject to ethical review by the Regional Ethical Review Board. The participants received written information about the study as well as orally, including withdrawal from the study, and provided informed consent. Data collection was carried out by the second and last author who had no prior relationships with the participants or involvement in the programme to ensure the option of dropout among participants.

Confidentiality was preserved in the study on several levels. All collected data was stored on a secure computer server accessible to the research team only. The transcriptions were coded by the first author before analysis and responses could not be linked to any participant or group.

Author contribution

All authors were involved in the design of the study. The second and last author performed the data collection. The first, second and last author were responsible for the definition of the units of data. The first author derived the units of reasoning from all data and did the descriptive analysis plot for data interpretation. All authors were involved in interpretation of data, drafting of the article and the approval of the submitted version of the manuscript.

Conflict of interest

There are no conflicts of interest to declare.

Acknowledgements

This study was supported by grants from governmental funding of clinical research within the National Health Services (ALFSKANE-464751).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2019.01.001.

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