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Concept mapping to promote meaningful learning, help relate theory to practice and improve learning self-efficacy in Asian mental health nursing students: A mixed-methods pilot study

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ABSTRACT

Objectives: Student nurses are provided with a great deal of knowledge within university, but they can find it difficult to relate theory to nursing practice. This study aimed to test the appropriateness and feasibility of assessing Novak's concept mapping as an educational strategy to strengthen the theory-practice link, encourage meaningful learning and enhance learning self-efficacy in nursing students.
Design: This pilot study utilised a mixed-methods quasi-experimental design.
Setting: The study was conducted in a University school of Nursing in Hong Kong.
Participants: A total of 40 third-year pre-registration Asian mental health nursing students completed the study; 12 in the concept mapping (CM) group and 28 in the usual teaching methods (UTM) group.
Methods: The impact of concept mapping was evaluated thorough analysis of quantitative changes in students' learning self-efficacy, analysis of the structure and contents of the concept maps (CM group), a quantitative measure of students' opinions about their reflective learning activities and content analysis of qualitative data from reflective written accounts (CM group).
Results: There were no significant differences in self-reported learning self-efficacy between the two groups ($p = 0.38$). The concept mapping helped students identify their current level of understanding, but the increased awareness may cause an initial drop in learning self-efficacy. The results highlight that most CM students were able to demonstrate meaningful learning and perceived that concept mapping was a useful reflective learning strategy to help them to link theory and practice.
Conclusions: The results provide preliminary evidence that the concept mapping approach can be useful to help mental health nursing students visualise their learning progress and encourage the integration of theoretical knowledge with clinical knowledge. Combining concept mapping data with quantitative measures and qualitative reflective journal data appears to be a useful way of assessing and understanding the effectiveness of concept mapping. Future studies should utilise a larger sample size and consider using the approach as a targeted intervention immediately before and during clinical learning placements.

1. Background

Student nurses are provided with a great deal of theory that they are expected to be able to relate and apply to clinical practice. The separation between classroom and practice placements can make it difficult to relate theory to nursing practice, resulting in confusion and potential damage to learning self-efficacy (Wells et al., 2015). Other studies have also reported that the perceived theory-practice gap is enlarged due to a mismatch between what is witnessed in the real-world of the clinical placement and the theoretical ideal practices that are taught in university (Gray, 1999; Duchscher, 2008). This perceived lack of understanding may also relate to the necessary mechanism by which leaners deconstruct and then reconstruct knowledge to develop their understanding over time in order to be able to relate theory to real life situations (Kandiko and Kinchin, 2012).

It has been suggested that students fragment large amounts of new knowledge into lesser parts and then rearrange them as part of the learning process (Novak and Cañas, 2006). Learners then develop further logical connections between these smaller concepts until knowledge is integrated with their existing understanding (D. Hay et al., 2008; D. B. Hay et al., 2008). Concept mapping is an approach that can capture a pictorial record of this process, similar to mind mapping

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(Buzan and Buzan, 2010). It has its basis in constructivist epistemology (Kandiko and Kinchin, 2012) and is concerned with the ways in which people organize and reorder new knowledge based on their past learning and understanding (Von Glasersfeld, 1984). Concept mapping has been utilised in a range of educational disciplines (Bressington et al., 2011, 2013), as a strategy to promote learners' development of an in-depth understanding (Buzan and Buzan, 1996; Baugh and Mellott, 1998).

The process of repeated concept mapping and subsequent reflection on the series of maps are thought to help students reconsider information in order to promote critical analysis (Wheeler and Collins, 2003) and deeper learning. This cyclical process of reflection on their concept maps helps students engage in further meaning-making by presenting an opportunity to picture the way they have worked through trying to understand a complex subject (Gul and Bowman, 2006; Bressington et al., 2011) and within nursing education the concept mapping approach has been shown to help effectively link theory and practice (Hicks-Moore, 2005).

Helping nursing students to become more effective at reflecting on their understanding is of paramount importance because their abilities to link theory with practice are closely related to their levels of theoretical knowledge and reflective learning skills (Hatlevik, 2012). Other studies have also shown that reflection and associated critical analysis can influence the way health professionals conceptualize their clinical practice and draw attention to related important knowledge or knowledge deficits (Lowe et al., 2007). Guiding students to reflect in a structured way on a series of concept maps may strengthen the theory-practice links because it enables them to visually reorganize, connect, and assimilate knowledge in different ways which promotes the development of an in-depth understanding of important subjects/issues of a profession (Hicks-Moore, 2005; Kinchin et al., 2008).

Using concept mapping to reflect on understanding has also been shown in some studies to improve learning self-efficacy by improving knowledge retention, clarifying concepts and enhancing interest in learning (Nesbit and Adesope, 2006; Chiou, 2008). Improving learning self-efficacy is important for the enhancement of academic progress because students with high learning self-efficacy generally have good levels of academic achievement and use more effective learning strategies (Chularut and DeBacker, 2004). The purposeful promotion of meaningful learning and the improvement of learners' self-efficacy may be particularly important in Asian students. Research shows that Asian learners can be comfortable with teaching styles that allow them to become the passive recipients of knowledge, resulting in superficial rote learning (Baumgart and Halse, 1999; Hsu, 2004). This is especially problematic for nursing education because rote learning is rapidly forgotten (Hsu and Hsieh, 2005), hard to apply in clinical situations and may reinforce the perceived theory-practice gap (Wells et al., 2015).

1.1. Aims

This pilot study aimed to test the appropriateness and feasibility of assessing the effectiveness of concept mapping as an educational strategy to encourage meaningful reflective learning, link theory with practice and enhance learning self-efficacy in mental health student nurse education. In order to determine appropriate and feasible methods of assessment, the specific study objectives were to;

- evaluate the changes in perceived learning self-efficacy in students who used concept mapping (CM) compared with usual teaching methods (UTM);
- compare students' opinions of CM or UTM as a reflective learning strategy;
- examine improvements in the CM students' understanding of 'the mental health nursing role' using concept map series data; and.
- explore experiences of CM for learning enhancement and integration of theory into practice from their reflective reports.

2. Methods

2.1. Process

Undergraduate mental health nursing students entering their third year of study were asked to participate in this project. The duration of the government funded undergraduate nurse training programme in Hong Kong is five years. Students entering their first year typically come from school aged around 17 years. The first two years of the programme focus on academic development and basic nursing concepts. Students embark on their first mental health clinical placement in the second semester of their third year.

In order not to deny any students the opportunity of engaging in the educational intervention randomisation into groups was not carried out. Instead, students that agreed to take part were able to specify if they wished to participate in the CM group, or the UTM group. Students in the UTM group were used as the comparison group. Students in both groups were required to engage in their usual teaching and learning activities throughout the study; this included writing a short reflection on their experiences of practice learning after completing their clinical placements.

All students completed a Self-Efficacy for Learning and Performance (SELP) scale (from the Motivated Strategies for Learning Questionnaire (MSLQ); Pintrich et al., 1993) to assess their perceptions of self-efficacy in learning at the start of semester 1 (T1), end of semester one (T2) and when they returned to university after their 3–4 weeks' clinical practicum (T3). The full MSLQ includes 81 self-reported items; it has been widely used in educational research and is an important tool to predict academic performance (Credé and Phillips, 2011). The SELP subscale contains 8 Likert scale items with a seven-point response option format (1 = "Not at all true of me" to 7 = "Very true of me") for each question. The subscale has been shown to have good internal consistency coefficients (Alpha = 0.93) and a significant positive correlation with final academic grade (r = 0.41).

At T2 and T3, participants were also asked to complete a Student Opinions Questionnaire (SOQ; Pee et al., 2002) to measure perceptions of the acceptability and usefulness of CM or UTM as a reflective learning strategy. The scale contains eight statements rated on a 5-point Likert scale, ranging from '1-strongly disagree' and '5-strongly agree'. The psychometric properties of the tool as a standalone measure have not been reported/established, but adequate internal consistency (Cronbach's alpha = 0.634) was confirmed using the baseline scores in the current study.

The CM group constructed three concept maps of their understanding about mental health nursing at T1, T2 and T3. This involved asking students to list all the important knowledge concepts they consider are associated with the "role of the mental health nurse". This broad concept was chosen because we wanted to avoid limiting the focus of participants' maps by directing them towards a specific area of practice or theory. Our earlier studies (Bressington et al., 2011; Wells et al., 2015) also demonstrated that using similarly broad role-related topics in concept maps effectively capture a visual record of how students make sense of their professional role over time as they acquire and attempt to integrate new theoretical and practical knowledge. The individual concepts associated with the mental health nursing role were then arranged by the student on A3 paper, rearranged as necessary, and lines were drawn between related concepts. The links should be drawn with an arrow that indicates the direction of the relationship and each link should be given a label that explains the relationship between the two concepts.

All CM students were asked to write a short (500 words) reflective report about their learning progress during a group session after completing their final concept map. This was prompted by looking back at their three concept maps. They were required to reflect on how their understanding had changed and illustrate this by giving examples from their maps. They were asked to explain their rationale for the adoption