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Review

A systematic review of creative thinking/creativity in nursing education

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SUMMARY

Objective: This systematic review aimed to identify the types of nursing course structure that promotes students' creative thinking and creativity.
Design: Systematic review.
Data sources: Five electronic databases: The British Nursing Index, CINAHL, PsycINFO, Scopus and Ovid Medline.
Review methods: The databases were systematically searched to identify studies that discussed the concept of creative thinking in nursing education or reported a strategy that improved students' creative thinking. Qualitative studies or studies that included qualitative data were included. After reading the full content of the included studies, key themes and concepts were extracted and synthesized.
Results: Eight studies were identified. Four main themes relating to the course structure in teaching creativity were developed: diversity learning, freedom to learn, learning with confidence and learning through group work.
Conclusions: To promote creative thinking in nursing students, educators themselves need to be creative in designing courses that allow students to learn actively and convert thoughts into actions. Educators should balance course freedom and guidance to allow students to develop constructive and useful ideas. Confidence and group work may play significant roles in helping students to express themselves and think creatively.
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Introduction

Creativity is an important skill for problem solving and generating new ideas. Nursing is a profession that often encounters unexpected situations and involves taking care of patients with different backgrounds and health conditions, hence nurses need to go beyond routine nursing and acquire creative thinking to make beneficial decisions. The following two statements, "creative thinking complements critical thinking" (Weston and Stoyles, 2007, p. x) and "using creative approaches may foster critical thinking" (Pavill, 2011, p. 20), make it clear that creative and critical thinking are interrelated and should be evenly balanced. However, over the past decades, nursing education has tended to place more emphasis on developing students' critical thinking (Oliver, 2010). Oliver (2010) agreed that creativity should be valued among nursing professions, as both creative and critical thinking skills are needed to identify issues and create critical solutions. According to the rural nurses in the Boucher's (2005) study, nurses often have to be creative enough to overcome and solve challenges, such as securing funding, obtaining supplies, dealing with patients from all walks of life and different medications and medical equipment. Moreover, Mumford et al. (2010) found that ethical decision making is positively correlated with creative thinking, which includes idea generation and evaluation, and solution monitoring. At the management level, innovation and strategic change are required to eliminate barriers and fulfill demands (Schultz et al., 2012). As nobody can predict the future, nurses should use their creativity to imagine possible upcoming issues and outcomes to prepare themselves for the future (Bunkers, 2011). The abovementioned literature suggests that nurses need to apply creativity in their decision making and problem solving.

It is not only practitioners who need to be creative; nursing educators must also embrace creativity to develop courses that can facilitate the growth of nursing students. Many creative nursing educators have adopted a variety of teaching strategies to improve the student learning experience. In 1960, McMaster University introduced the now famous problem-based learning technique to facilitate students' critical thinking and self-directed learning and to put their knowledge into practice (Norman and Schmit, 1992). To increase nursing students' interest and motivation to learn, some educators have applied multimedia and storytelling as teaching strategies (Chang and Hsu, 2010; Hunter and Hunter, 2006). To promote the active sharing and learning of nursing skills among students, some educators have used YouTube as a platform for education and discussion (Logan, 2012). Furthermore, some educators have used humor, games and peer teaching to make the learning environment more lively and reduce students' stress (Baid and Lambert, 2010; Moscaritolo, 2009). However, being a creative educator is not enough; educators should also foster nursing students' creativity as nurses are a valuable resource in healthcare.

Although it is true that some people are more creative than others, Gomez (2007) argued that everyone can be creative and creativity can be developed. Therefore, nursing education should also emphasize nurturing students' creativity. To increase students' creative thinking,

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educators should explore areas of interest to students and design assignments or activities that encourage imagination and reflective thinking (Zygmont and Schaefer, 2006). There are studies that showed that doing artistic work may encourage students to "think outside of the box". Recently, more creative educators have been implementing art into nursing, such as asking students to create sculptures, music, poems, role play, drawing and sculptures (Chan, 2012, in press; Emmanuel et al., 2010; Pavill, 2011). Last but not least, there has been a recent call for creative thinkers to make a breakthrough in nursing research (Bradbury-Jones and Herber, 2011). It is evident that creative thinking is an essential skill in different nursing areas, including practical, management, education and research. However, systematic reviews on creativity in nursing education are very rare. This review paper thus explores the course structures that could foster nursing students' creative thinking/creativity.

The Review

Inclusion and Exclusion

Types of Participants

Regardless of age, gender and nationality, this review only considers studies that involved more than two nursing students enrolled in nursing education programs.

Types of Studies

The review considers qualitative studies or other methods that include qualitative results. The included studies are in English and are peer reviewed. Quantitative studies, case reports, and course description reports were excluded.

Types of Intervention

The review considers studies that mention a nursing education program or a program style that could foster nursing students' creative thinking/creativity.

Search Strategy

In June 2012, a computer-assisted literature search of five databases, The British Nursing Index, CINAHL, PsycINFO, Scopus and Ovid Medline, was conducted. To locate relevant studies that explore creative thinking/creativity in nursing education, searches included the following combination of keywords: nurs* and creativ*, and curriculum or lecture or teach* or learn* or program* or educat* or class*, and qualitative or quantitative or study or research or interview* or questionnaire*. The timeframe of the search result was from January 2002 to December 2011 and "peer reviewed" was selected as a criterion for the search.

Screening Outcome and Quality Appraisal

The original search of the five databases was conducted by a research assistant and identified 1929 studies. Following the removal of duplicates and screening of titles and abstracts, 62 full-text articles remained for retrieval. The full texts of the remaining articles were read to check whether they met the inclusion criteria. The full-text screening process required a positive answer to the following two questions: (1) "Does this article report on primary findings and involve qualitative methods of data collection and analysis?" and (2) "Is the research relevant to the review topic?" (Chan et al., 2012, p.814). Fifty-five studies were rejected because they were not qualitative, did not include qualitative data, or there was no connection between the nursing education program and nursing students' creative thinking/creativity. The reference lists of the seven accepted studies were screened and one more appropriate study was identified, which finalized the search to eight articles. The eight articles were read by the principal researcher and a consensus was reached to include all eight articles in the review (Fig. 1).

Data Synthesis

This systematic review adopted thematic synthesis. The eight studies were read thoroughly to identify critical points and themes (Boyatzis, 1998). The papers were synthesized under the following subheadings: research aims, design and data collection, sample number and characteristics, intervention, research findings and implications (see Table 1).

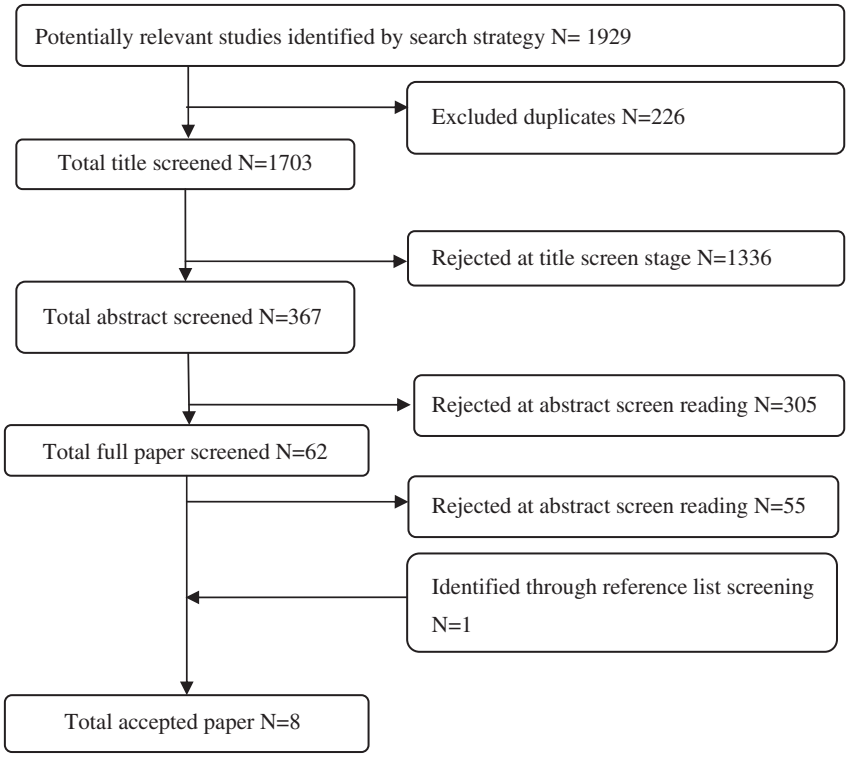

Fig. 1. Flow diagram of the systematic review process.

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Table 1
Summary of the included studies.

Author Year Country	Aims	Design and data collection	Sample number and characteristics	Intervention	Research findings
Cooke and Moyle (2002) Australia	To explore students' evaluation of problem-based learning (PBL)	-Descriptive study -Questionnaire with five open-ended questions	-130 year 2 nursing students whereas 100 students completed the questionnaire -2 teachers	PBL	PBL promoted creative discussions which each group member had to think creatively so as to share useful and constructive ideas.
Emmanuel et al. (2010) Australia	To describe the learning outcome of using creative art as a teaching strategy	-Cohort study -Aggregate score of assessment -Defining student performance categories -Assessing masks -Students' evaluation -Verbal feedback from teaching team	-146 first year students	Mask design	-Qualitative comments reflected that they had to combine their creativity, practical knowledge and analytic skills to complete the mask design. -Students' creativity was expressed in the created mask (materials, colors and design).
Hall and Mitchell (2008) UK	To explore the effectiveness and value of creative art as a teaching method	-Retrospective and qualitative inquiry -Open ended questionnaire and five art works	-6 female student midwives -Age ranged from 20–30 years old	Creative birth art	-Students used different kinds of materials, colors, symbols to express their knowledge and imagination of birth.
Hydo et al. (2007) USA	To explore an educational research project that used art as a scaffolding teaching strategy for self awareness	-Naturalistic inquiry -Students wrote responses to several open-ended questions	-101 nursing students whereas 91 were given consent forms for data analysis. -Over 80% of students are female and under 25 years old	Students could use any art forms (music, dance, sculpture, painting, drama, poem, etc.) to express what nursing meant for them.	-The students had to brainstorm and think creatively in order to create an art work that could express what nursing is. Moreover viewing each others' creative artworks gave students inspiration.
Kalischuk and Thorpe (2002) Canada	To explore the concept creativity in post-RN nursing education	-Qualitative research -2 months weekly focus group discussions	-13 post-RN student participants whereas 10 participants involved all group discussions -All females and age ranged from 21 to 46	N/A	-To foster students' creative thinking, education programs should enhance self-esteems, give time for reflection, provide freedom for creative while having some structure as well, and promote self-care to achieve balance.
Klunklin et al. (2011) Thailand	To explore students' perspective on PBL and the implementation of PBL in future nursing curriculum development	-Descriptive qualitative design -In-depth semi-structured interviews	-25 nursing students (aged from 19 to 23) -23 females and 2 males	PBL	-Learning with PBL enhanced students' thinking ability, including more systematic, creative and conceptual fashions. The experience enabled them to create mind-maps and constructive ideas.
Lillyman et al. (2011) UK	To suggest storytelling could be a possible teaching-learning strategy in health care curriculum	-Cohort qualitative study -Open-ended questionnaires	-39 second year, pre-registration student nurses completing the Diploma in Higher Education Nursing and Degree programs	Presented stories through drawing storyboard picture as well as write out the process and feelings	-Requires creativity to generate critical ideas during the storyboarding process
Neuman et al. (2009) Unknown	To understand students' attitude and perspective towards innovative teaching strategies	-Qualitative study -Group discussion	-11 associate degree students -9 Master's nursing students -2 traditional baccalaureate students' groups -16 RN-BSN -9 Master's nursing students -Age ranged from 20–50 years old	-Associate students had to write patient scenario for a human patient simulator. -Baccalaureate students made best practice implementation plan. -RN-BSN students had a group project and peer learning -Master's students worked with the state nurses association to analyze different health care reform legislature proposals	-Every student could come up with new ideas. -Being in an active role in teaching and learning process stimulated their creativity. -Tired to add interesting and humorous things to make learning more interesting

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Results

Description of Study

A total of eight studies were included in the review. The studies were conducted in Australia (n = 2), Canada (n = 1), USA (n = 1), UK (n = 2), Unknown (n = 1) and Thailand (n = 1). There were five qualitative studies, two cohort studies and one retrospective study. All of the studies included qualitative results and most of the study outcomes were based on student self-report data. Creativity was not a major outcome in some of the studies (Emmanuel et al., 2010; Hall and Mitchell, 2008; Lillyman et al., 2011). One study (Kalischuk and Thorpe, 2002) involved no intervention, but presented post-RN students' opinions on what kind of nursing education program could improve students' creativity. The other seven studies adopted innovative teaching strategies, including Problem-based Learning (PBL), creative art works, storyboarding and innovative assignments. The sample size varied from 16 to 146 nursing students. Four studies (Cooke and Moyle, 2002; Hall and Mitchell, 2008; Hydo et al., 2007; Kalischuk and Thorpe, 2002) did not collect and evaluate data from all of the recruited samples due to participant's withdrawal.

Outcomes

From the eight studies, four themes related to teaching creative thinking were identified: diversity learning, freedom to learn, learning with confidence and learning through group work. Participants' quotes from the original studies are presented to support and interpret the four themes.

Diversity Learning

In some studies, teaching and learning in nursing programs involved artistic works, including mask design (Emmanuel et al., 2010), creative artwork (Hall and Mitchell, 2008) and art forms such as music, dance, sculpture, painting, drama, story, poetry, paper, construction, wood, fabric and other forms (Hydo et al., 2007). Emmanuel et al. (2010) and Hall and Mitchell (2008) revealed that students had to be creative to develop a design, and to choose appropriate materials, colors and symbols to express their beliefs and values correctly. To complete a piece of artwork during the lecture, the ability to create, analyze and brainstorm was essential.

…both creating and viewing…I was brainstorming for my own artwork. (Participant quote, Hydo et al., 2007)

In Lillyman et al.'s (2011) study, students were asked to express their clinical experience through storyboarding, which involved drawing the scenes and writing out critical descriptions. The author used storyboarding to engage nursing students in creative, critical and reflective thinking. In Neuman et al. (2009), students played an active role in the teaching and learning process, which was intended to stimulate their creativity in putting knowledge into practice. Two studies adopted PBL (Cooke and Moyle, 2002; Klunklin et al., 2011). The students in Cooke and Moyle's study found that the PBL discussions encouraged them to be more creative and to think more. Those in the study by Klunklin et al. revealed that PBL allowed them to think more systematically, creatively and conceptually:

It (PBL) teaches me how to think creatively. I can study a subject by myself and it will help me remember the principles of the content better than just listening to a lecture. (Participant quote, Klunklin et al., 2011)

Although the contents of the learning strategies varied among the studies, they all required students to be active in learning, to put knowledge into practice and to convert thoughts into actions. To meet the course requirements, students needed to think creatively to solve problems and express their thoughts in a coherent manner.

Freedom to Learn

Some participants commented that lectures that were more student-centered and allowed them to gain more control over the teaching and learning process gave them a sense of freedom and autonomy. This freedom gave students space to use their creativity and generate ideas:

[There was] more control, more feedback, more autonomy to direct and influence class discussion. Giving us space to make options and rational ideas. (Participant quote, Cooke and Moyle, 2002)

However, as Kalischuk and Thorpe (2002) observed, freedom and guidance should be well balanced, as students require guidance on their assignments and some want to be clear about the instructor's expectations:

I was just thinking about structure and nonstructure, because you need some, just to have a bit of guidance, but not so heavy that it stifles creativity. (Participant quote, Kalischuk and Thorpe, 2002)

…It's really frustrating, it's always, "I've got to think what the instructor wants to hear." (Participant quote, Kalischuk and Thorpe, 2002)

Teachers play an important role in guiding students' learning. Teachers are an important resource for students, and as such they should be well prepared and able to provide appropriate instructions. Rather than giving out information directly, teachers should question and challenge students, and encourage them to think and participate in discussions (Cooke and Moyle, 2002; Klunklin et al., 2011; Neuman et al., 2009).

Teachers have a big helping role…Teachers encourage us to think, speak out, and express our opinions. (Participant quote, Klunklin et al., 2011)

Students' creativity may be released when they have the autonomy and freedom to do what they want. However, while allowing freedom, a teacher should also act as a helpful coach and provide a clear structure and directions or suggestions to keep students on the right track, otherwise they may feel confused about the aims of the course.

Learning with Confidence

Self-confidence may play a role in creativity and the expression of ideas. As revealed by Kalischuk and Thorpe (2002), students who have high self-esteem are more willing to step out of their comfort zone and contribute creative ideas. A similar phenomenon was reported by Klunklin et al. (2011). They found that students were unwilling to speak out because of a lack of confidence and were too shy to speak out in front of unfamiliar people. Moreover, some students were anxious and unable to adapt to the new teaching strategy. Therefore, before improving students' creative thinking, the first step may be to build students' self-confidence and encourage them to take risks.

It's really important that we feel good enough in ourselves to be able to share creativity to the best of our abilities…you have to learn not to be so afraid to give it all. (Participant quote, Kalischuk and Thorpe, 2002)

Perhaps the simplest way to increase students' self-confidence is to value their contributions and appreciate their efforts, while also encouraging them to leave their comfort zone.

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My role as a student was different as I felt important and information I gathered felt valuable and everyone was interested in my opinion. (Participant quote, Cooke and Moyle, 2002)

It [storyboarding activity] improved my confidence in public speaking and group work skills whilst at the same time exploring a topic (Participant quote, Lillyman et al., 2011)

The above quotes clearly show that confidence plays a significant role in students' willingness to express ideas and take risks. Three major areas that hinder students' confidence in expressing creativity are failure, personal characters and unfamiliarity, thus it is important to develop students' confidence in readiness for a breakthrough.

Learning through Group Work

A few studies (Cooke and Moyle, 2002; Hydo et al., 2007; Neuman et al., 2009) reported that their teaching strategy involved group discussions. From the participants' viewpoint, the activity encouraged them to think more creatively because the group sharing process encouraged students to think of new ideas and allowed them to learn from each other.

Teaching this way encouraged students to think creatively and understand how to put together all they have learnt. (Participant quote, Cooke and Moyle, 2002)

…some of the things they (classmates) thought of and presented I had never even considered… (Participant quote, Hydo et al., 2007)

However, as the participants in the Neuman et al.'s study noted, the group should not be too large and the ideal number is no more than four people. Moreover, not all members interact equally in the group discussions or work well with the group:

As often happens in groups, one member decided to take over meeting times, delegation of responsibilities, and actions. (Participant quote, Neuman et al., 2009)

Group work allows students to share ideas and interact with other thinkers. The learning process can help students to discover new ideas and reinforce or modify their original ideas. It is important to keep in mind that the success of group work may depend on the group size and members' attitudes. Educators should consider students' relationships and abilities when assigning groups.

Discussion

It is not only nursing that requires more creative thinkers; almost every industry is striving to improve creative thinking in their future professionals. Although the teaching and learning materials differed among the reviewed studies, all of the educators who were trying to foster students' creativity were moving away from traditional teaching. Traditional classroom settings and instructions (e.g. tests and exams, and teacher-centered learning) may inhibit students' creativity, whereas student-centered, game-like and less rule-based activities can release creativity (Klunklin et al., 2011; Wallach and Kogan, 1965). Other than nursing educators, some MBA and engineering courses have also used art to cultivate students' creative thinking (Pinard and Allio, 2005; Rose, 2011). Fostering creativity does not necessarily have to involve art; activities such as creative writing and problem solving in groups also yield satisfactory results (Das, 2012; Klunklin et al., 2011; Lillyman et al., 2011). The most important factor in designing an effective course for developing creativity is to provide students with the space to generate ideas (problem solving, design, combining experience and knowledge), to try out ideas (performing and expressing ideas) and to become aware of their surroundings (questioning and looking for specifics) (Karpova et al., 2011). Moreover, programs that are of interest to students increase their motivation and curiosity to ask questions, explore answers and become divergent and creative thinkers (Wood, 2006). Therefore, it is suggested that nursing educators should try to design innovative programs or problems based on real-life case studies, which allow students to release their creativity and curiosity.

Apart from their curiosity, students' confidence must also be considered, otherwise they may "think" creatively but not "dare" to accomplish the goal. As other scholars have suggested, self-confidence is an important trait that influences risk-taking behavior and creativity. As mentioned in the Results section, confidence may be influenced by failure, shyness and unfamiliarity with innovative teaching methods. To increase students' confidence, educators should not seek right or wrong answers, but should create a class environment that welcomes and respects students' ideas (Gomez, 2007). Historically, many famous inventors' ideas that were originally thought to be a failure have turned out to be a great success. Therefore, educators should value every idea and provide supportive feedback to guide students' self-reflection (Dineen and Niu, 2008). Because doing something unfamiliar can be stressful and confusing, educators should ensure that the course aims and objectives are clear to the students. Educators should also act as coaches and be prepared for students who need inspiration and help.

In our results, four out of seven intervention studies reported that group work could foster students' creativity. The same has been found in other studies (Cardellini, 2006; Fenge, 2012). Solving problems as a group can promote active and peer learning. Problems can often be solved more easily by groups than by individuals, because new ideas and directions may be triggered by listening to others' opinions. Without exposure to new knowledge, it is not possible to create new combinations and generate new ideas. When working as a group, members interact and inspire one another to achieve the best idea. Apart from promoting creativity, it is clear that group work may improve communication and interpersonal interaction. Therefore, when designing new programs, educators should consider implementing group work activities or opportunities for interaction.

Limitations

This review did not include any quantitative studies, thus the acquired data represent participants' self-reported opinions. Students who reported better creative thinking did not undergo any analysis that could demonstrate a difference or show how creative they were, such as completing the Torrance Test of Creative Thinking (Karpova et al., 2011), or expert review. Therefore, future reviews on creative thinking in nursing education should include both qualitative and quantitative studies. Most of the participants in the reviewed studies were students, whereas nursing educators' and practising nurses' perspectives on creative thinking were rarely explored. Moreover, only eight studies were included in the review and the sample sizes were relatively small, hence the results can only serve as a suggestion rather than a generalized idea. Finally, the original aims of the seven teaching intervention studies were not focused on exploring students' creative thinking, which means that creativity was only one of the outcomes of the interventions and none of the studies provided a consensus definition of students' creative thinking.

Conclusion

In this systematic review, eight nursing studies were reviewed, including seven studies that involved teaching interventions designed to increase students' creativity and one study that explored the concept of creativity in nursing education. Four strategies for boosting students' creative thinking emerged: diversity learning, freedom to learn, learning with confidence and learning through group work. It is suggested that when designing a course to teach creative thinking,

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educators should provide activities, assignments or problem cases that allow students to use their creativity freely. Educators should value all ideas, encourage students to think, and give feedback that will guide students in the right direction. Group work and group interaction should also be considered as they may promote creative thinking.

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