Knowledge of Nursing Journal

Spring 2023,1(1): 91-98
http://knjournal.ir

Original Article **Open Access**

SNAPPS Case Presentation Method and Clinical Reasoning in Midwifery Students: A Clinical Trial

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Abstract

Background and Aim: SNAPPS is a case presentation technique that has been shown to use the expression of clinical reasoning. This study aimed to evaluate the efficacy of SNAPPS and clinical reasoning in midwifery students in an ambulatory setting.
Materials and Methods: A semi experimental study with a pretest-posttest design was carried out on all 80 midwifery internship students in a women's health ambulatory setting (Tehran Medical Sciences Islamic Azad University) in 2020. A simple random allocation method was used to assign students to the intervention and conventional groups. The two groups were matched in terms of age and grade point average. Both groups participated in a virtual pretest including 40 multiple-choice questions identified as "must know". The intervention group was then subjected to the SNAPPS technique by watching videos over three 45-min sessions. Next, both groups attended in a two-week ambulatory rotation and after individual work in the case, the main investigator and four instructors recorded the data on a data-recording sheet. Both groups then participated in a posttest. Data were compared by independent t-test.
Results: There was a statistically significant difference in favor of SNAPPS compared with the conventional group (P=0.000). The students of the SNAPPS technique summarized patients records more concisely (P<0.005), were clearer about their diagnostic hypothesis (P<0.005), and better differential diagnoses (P=0.002).
Conclusion: The SNAPPS technique provides the opportunity for expression of clinical reasoning which is highly challenging for instructors to evaluate in a standardized fashion.
Key Words: Ambulatory Education; Model Education; Learning; Clinical Reasoning

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Received: 29 January 2023, **Accepted**: 18 April 2023, **ePublish**: Spring 2023

Citation: Abbasi Senjedari Z, Peyman A, Nakavand M. SNAPPS Case Presentation Method and Clinical Reasoning in Midwifery Students: A Clinical Trial. Knowledge of Nursing Journal. 2023;1(1):91-98.

[Downloaded from knjournal.ir on 2026-11-18]

[DOI: 10.61186/knjournal.1.1.91]

Introduction

Clinical reasoning is the professional skill and knowledge to collect and analyze patient data, evaluate their significance, identify actual and potential patient problems, and find the best measures to manage the identified problems and improve patient outcomes [1].

The complexity of maternal and neonatal cases encountered by midwives requires them to be able to interpret the clinical data of patients and relate the clinical reasoning process to clinical judgment [2].

The majority of maternal and child mortality cases are due to complications during pregnancy and childbirth are attributed to an under-prepared midwifery workforce, highlighting the demand for competent midwives who can use their clinical reasoning skills to respond to the maternity healthcare needs of the community [3].

Although numerous studies regarding clinical reasoning have been conducted, clinical reasoning is a complex concept, especially within the context of undergraduate programs. Moreover, in midwifery and nursing education and practice, there is a conceptual confusion as to what clinical reasoning entails, how it can be taught and assessed, and the related research and practice implications [4].

Despite the importance of clinical reasoning as a basic skill for midwives, evidence is scarce in the literature for recognition of educational initiatives to allow for the development of these skills [5].

In the 1960s, nursing led the way in introducing clinical reasoning skills through the nursing process.[6].Several teaching and facilitation methodologies, such as problem-based learning, case studies, simulation, concept mapping, portfolios, essays, and journals were developed to enhance the development of clinical reasoning skills [7]. There is, however, no conclusive evidence that these strategies indeed enhance the development of clinical reasoning skills [8].

Clinical reasoning strategies that midwifery students were used affect their diagnostic success. For development of students' clinical reasoning skills, educators first need to access to the learners' clinical thinking [9]. A systematic review on the efficacy of teaching methods to develop critical thinking skills in midwifery and nursing undergraduate students reported inconsistencies in this respect [10].

Medical education in ambulatory settings has created challenges in teaching and learning that cannot be solved by the adoption of traditional inpatient approaches. In the ambulatory setting, where learning moments are seldom longer than 5 minutes, classes work are best when there is a balance of experience and education [11].

Given the changes in the role of learners in engaged education, SNAPPS is a new ambulatory educational model (Summarize briefly the history and findings; Narrow the differential to two or three relevant possibilities; Analyze the differential comparing and contrasting the possibilities; Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches; Plan management for the patient’s medical issues ; and Select a case-related issue for self-directed learning) is a learner-centered case presentation technique that enables the process of hypothetical-deductive approach and self-directed learning. The ability to develop a differential diagnosis and justify

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[DOI: 10.61186/knjournal.1.1.91]

the features of a differential diagnosis; is a process to further improve clinical reasoning. SNAPPS is a technique for case presentation [12]. The steps in the SNAPPS technique are drawn from the cognitive rating scale developed by Collins [13]. A small study was done in a pediatric outpatient clinic demonstrated the effectiveness of SNAPPS as a method of case presentation that improved clinical reasoning. The residents in the study perceived that the SNAPPS model was more structured, stimulating and relevant to teaching in the outpatient department (OPD) and was easy to follow and motivated them for self-learning [14]. Midwifery students that enter the ambulatory care setting have diverse abilities and expertise; thus, the duration of case presentations should generally not exceed six to seven minutes. The SNAPPS model depends on a learner–teacher Continuum that should ultimately be controlled by the learner, but may initially require coaching by the teacher to help the learner master the steps more easily and proficiently. It is also important that teachers create an expectation that the learner can and should take a central role and ask questions [15]. Therefore, this study aimed to evaluate the SNAPPS case presentation technique in the ambulatory care setting of Tehran Medical Sciences Islamic Azad University.

Methods

This semi experimental study with a pretest-posttest design was approved by the ethics committee of Islamic Azad University of Tehran ref no. (IR.IAU.TMU.REC.1399.247). Informed consent was obtained from the midwifery students before inclusion in the study. The study subjects were 80 internship midwifery students who attended women's health ambulatory settings of medical universities who were assigned to two groups. According to a study by Wolpaw et al. (2003), the sample size was calculated for each variable [7]. The strictest requirement for sample size was a student-initiated management plan that required 27 subjects per group for 80% power and 95% confidence interval. Additional subjects were added per group, for a total of 40 subjects SNAPPS groups and conventional groups. The participants who agreed to participate in the study were divided based on a simple random sampling method by using a table of random numbers. The first investigator supervised the SNAAPS group. four clinical instructors supervised the conventional groups. Instructors were selected among the faculty members of the department of midwifery who were regularly involved in teaching. The inclusion criterion was all internship midwifery students in the academic year 2020 and the exclusion criterion was failure to participate in the pre-test or clinical rotation. The selected topics for case presentation included vaginitis, cervicitis, abnormal uterine bleeding, Pap smear, and prenatal care. Due to the COVID-19 pandemic, the two groups participated in a virtual pretest including 40 multiple-choice questions that were designed by midwifery experts, and the reliability of the questionnaire was assessed by the Cronbach’s alpha. The first investigator carried out a 30-minute video instruction demonstrating the SNAPPS technique for instructors and they had an opportunity to ask questions and clarify their problems. The instructional video was a validated video used by a previous study [16]. The instructors also received a data recording sheet highlighting the six steps of the

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SNAPPS technique. The data recording sheet included eight outcomes (dependent variables) related to expressing clinical reasoning as well as presentation time. These eight outcomes were measured by Wolpaw et al [17] and Sawanyawisuth et al [18].

The 8 outcomes were as follows:(1) Presentation time in minutes (total, start-to-end time)(2) Summary regarding the presentation time in minutes (chief compliant, history of present illness, physical examination, and imaging).(3) Discussion: total time (variable 1) minus summary time (variable 2).(4) Clinical reasoning: Number of basic clinical attributes of the chief complaint and history of present illness (maximum of 9), include: patient characteristics, onset of disease, location of involvement, severity, course, quality, context, associated manifestations, and aggravating-alleviating factors. (5) Number of diagnoses (Dx) in the differential diagnosis (DDx): total number of diagnostic hypotheses expressed by the student. (6) Number of justified Dx in the DDx: any given Dx could be supported by patient findings, knowledge about the disease, and reference to the literature or past experience. (7) Discussion about, all uncertainties and obtaining clarification. This variable was added to more precisely accurately assess the extent to which the students used basic knowledge. (8) Number of students initiating patient management plan and identification of case related topics and resources for self-study learning [17-18].

The SNAPPS groups assigned to the orientation session took place on the Friday before the start of the three-week virtual classroom of researcher-led clinical reasoning learning modules.

The classes were held on three consecutive Fridays in 45-minute sessions. We used the lecture method with a PowerPoint slide (version 2010; Microsoft Corporation, Redmond, WA) presentation. Then, the SNAPPS group attended a two-week ambulatory rotation and after individual work on the case, they presented the case using the SNAPPS technique. The clinical reasoning scores of the two groups were assessed by using a data-recording sheet. In the conventional group four instructors recorded the data on the data-recording sheet after each presentation (Table 2). At the end of the clinical rotation, outcomes were measured by comparing the mean posttest score.

All the data from the data-recording sheet and pretest and posttest were entered electronically using Microsoft excel. Data were analyzed by SPSS version 24 (Stata Corporation, Texas, and USA) [19]. The sample size was (N=80) normally distributed as shown by the Kolmogorov-Smirnov test. The means were compared with 2-tailed unpaired t-test, paired t-test, and proportions with the Chi-square test and regression model. $P< 0.01$ was considered significant. To determine either a possible improvement simply due to additional time, the correlation between the total presentation time and the outcome variables was analyzed for SNAPPS and conventional groups using the Spearman's rho coefficient.

Results

The mean age and grade point average in the past semester of midwifery internship students, SNNAP group, were 23±0.94 years and 16.65±0.26 out of score 20, respectively. Distribution of age and grade point average were normal (Table 1).

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Table 1: Demographic characteristics for midwifery students

group	variable	Mean and Standard Deviation	N
SNNAP Group	age	23.94± 0.42	40
	Average grade point score	16.65± 0.26	
Conventional group	age	24± 2.03	40
	Average grade point	16.14± 1.46	

The mean pretest score in the SNAPPS and conventional groups was 11.26±1.19 and 11.23±1.18. There was no significant difference in the pretest score between the two groups as shown by unpaired t–test (P=0.91, Table 2).

Table 2: Mean pretest and post-test scores in the conventional and SNAPPS groups

variable	Sub group	Mean	Standard Deviation	t- test	Sig	N
Pretest	SNAPPS	11.26	1.19	-1.052	0.91	20
	Conventional	11.23	1.18			20
Post-test	SNAPPS	18.575	2.29	-5.289	0.02	20
	Conventional	18.14	1.03			20

There was a statistically significant difference (P<0.000) in favor of SNAPPS in the posttest. The SNAPPS was found to be significantly more effective than the conventional method (P<0.000) (Table 2).

The presentation length in the SNAPPS group took averagely 1.6 min more for entire case presentation (7.19 vs. 5.56 minutes, P<0.01). The time taken to summarize was shorter in the SNAPPS group but not significant (3.15 vs. 3.48 minutes, P=0.177). The time taken for discussion was significantly longer in the SNAPPS group as compared to the control group (4.04 vs. 2.07 minutes, P<0.01). Students using the SNAPPS technique were more concise in their summaries (proportion of total presentation time) than students in the control group (2.28 compared to 1.6, P=0.69). The SNAPPS group was significantly better at discussing patient management (Table 3).

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Table3: Comparison of the two groups regarding different topics

SNAPPS variables	SNAPPS Group (Mean ± SD) in minutes	Conventional Group (Mean ± SD) in minutes	P -value
Summarize briefly the history and findings	3.15 ± 0.98	3.48 ± 0.80	t = 5.45 p< 0.01
Narrow the differential to two or three relevant possibilities	7 ± 2.27	5.22 ± 2.33	t = 5.45 p< 0.01
Analyze the differential comparing and contrasting the possibilities	2.04 ± 1.06	1.07 ± 0.73	t = 3.33 p = 0.002
Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches	2.19 ± 0.68	1.07 ± 1.04	t = 4.65 p< 0.01
Plan management for the patient's medical issues	27 (100%)	21 (77.8%)	X2 = 8.33 p = 0.004
Select a case-related issue for self-directed learning	27 (100%)	9(33.3%)	X2 = 3.0 p = 0.083

Discussion

This study highlighted the successful use of the SNAPPS technique for case presentations in the ambulatory care setting by midwifery students. This randomized trial showed that SNAPPS is a learner-center case presentation technique that utilizes the expression of clinical reasoning without lengthening the unusual length of student case presentations [15-18]. Each of the eight study outcomes has important implications in teaching and learning in an ambulatory setting [17-18]. Summarizing patient findings and narrowing differential diagnoses in the SNAPPS group took a little longer than that in the conventional group, but their discussions were significantly longer and their summaries shorter [18]. In various case encounters, the students in the SNAPPS group have more basic clinical attributes and more differential diagnoses as compared to the control group [17]. In this study, we compared the mean score of the post-test of the two groups. To the best of the authors' knowledge, this study was the first concerning clinical reasoning with a new technique. Significant learning outcomes occurred in the SNAPPS group. At the same time, the significant difference between the post-test scores of SNAPPS and conventional groups implies that SNAPPS was certainly more effective than the conventional learning method. Providing opportunities during the clinical experience for students is an important aspect in development of clinical thinking [18]. The students in the conventional group had an inferior performance in diagnostic hypothesis and were more interested to jump to management issues. This reduced communication made it difficult for the instructor to understand the clinical reasoning of students and also caused difficulty in providing effective feedback [21]. This finding was consistent with a study that students in the SNAPPS group are out performed students in comparison with customary groups for each outcome category [17]. Other studies showed that SNAPPS allows students to express these levels of clinical reasoning, regardless of their stage of academic development, in a more deliberate, conscious manner [21-23]. The main strength of current study was holding three virtual classes with a clinical reasoning learning model and the main limitation of this study was that it was conducted in a small community of students, which limits the generalizability of the results to

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other settings. We recommend SNAPPS case presentation technique for clinical reasoning by midwifery students in ambulatory care settings. Further studies are required before its implementation for other undergraduate students using a larger sample size and using different tools of assessments for testing clinical reasoning [22-23]. More randomized trials are required to standardize the time of summary presentation and standardize the total duration of time for undergraduates.

Conclusion

The SNAPPS technique improved clinical reasoning expression much more effectively than conventional case presentation method for midwifery students in an ambulatory care setting.

Acknowledgments

The authors would like to thank all midwifery students and teachers who participated in this study. We would also like to thank the obstetricians and medical education experts who contributed to validation of the questionnaire. This study was part of a research project in medical education, which was supported and approved by the Islamic Azad University of Tehran.

Conflict of Interest

The authors declare no conflict of interests.

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