

## Brief report

## The effect of the SNAPPS (summarize, narrow, analyze, probe, plan, and select) method versus teacher-centered education on the clinical gynecology skills of midwifery students in Iran

Hamideh Barangard<sup>1</sup>, Poorandokht Afshari<sup>1\*</sup>, Parvin Abedi<sup>2</sup><sup>1</sup>Midwifery Department, Reproductive Health Promotion Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran;<sup>2</sup>Midwifery Department, Menopause and Andropause Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran**Abstract**

This study aimed to determine the effect of the SNAPPS (summarize, narrow, analyze, probe, plan, and select) method versus teacher-centered education on the clinical skills of midwifery students in Iran. In this clinical trial, 36 midwifery students in their 4th year of education in 2015 were enrolled and divided into 6 groups, 3 groups for teacher-centered education and 3 groups for the SNAPPS method, with each group spending 10 days in the outpatient gynecology clinic. A questionnaire and a checklist were used to gather data. An independent t-test and chi-square test were used to analyze the data. Ability to gain the trust of the patient, verbal and nonverbal communication skills, history taking, preparation of the patient for gynecological examination, and diagnosis and treatment of common diseases were significantly better in the SNAPPS group compared to the teacher-centered education group ( $P < 0.05$ ). The SNAPPS education method can significantly improve the clinical skills of midwifery students in gynecology, in particular history taking, differential diagnosis, and treatment of common diseases.

**Keywords:** Clinical competence; Gynecological examination; Medical history taking; Midwifery; Iran

The common method of clinical education for midwifery students in Iran is teacher-centered. In this traditional method, the teacher explains the patient's condition, the student and teacher examine the patient, and then a decision is taken for diagnosis and treatment. Traditional teacher-centered education methods may lead to inadequately developed clinical skills [1]. Other studies have shown that midwifery students were not satisfied with clinical skills, supervision, and access to necessary information before clinical education [2,3]. In addition, studies have shown that implementing new methods such as DOPS (direct observation of procedural skills) and preceptorship could significantly improve the clinical skill

of midwifery students in comparison to teacher-centered education [4,5]. One of the alternative, student-led education methods available is called the SNAPPS method. SNAPPS stands for summarize, narrow the differential diagnosis, analyze the differential diagnosis, probe the preceptor by asking questions, plan management for the patient's medical issues, and select a case-related issue for self-directed learning [6]. This study aimed at comparing the effect of the SNAPPS method versus the traditional teacher-centered method on clinical skills of midwifery students studying gynecology in Iran.

This was a clinical trial in which all midwifery students of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran recruited were in their 4th year of education ( $n = 36$ ). This study was conducted from March to July 2015. These students were divided into 6 groups ( $n = 6$ ), and each group spent 10 days (3 days each week) in the outpatient gynecology clinic at Imam Khomeini Hospital, which is a teaching hospital in Ah-

\*Corresponding email: [p\\_afshary@yahoo.com](mailto:p_afshary@yahoo.com)

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vaz, Iran. Three groups were recruited for traditional teacher-centered education and 3 other groups for the SNAPPS educational method. Each group consisted of 6 students and the assignment of students into groups was supervised by the head of the Midwifery Department; therefore, the authors were not aware of the grouping. To avoid information transfer, the first 3 groups underwent teacher-centered education and the other 3 groups underwent the SNAPPS method. Both groups received education from one of the authors (HB). On the first day, the preceptor provided some information regarding the SNAPPS method, and on the same day, students' potential doubts were addressed.

### Procedure

Students in the SNAPPS method groups were educated according to the 6 steps introduced by the developer of this method [6]. In step 1, the student should briefly summarize the patient's history and findings. In step 2, the student should narrow the differential diagnoses to 2 or 3 relevant possible diagnoses. In step 3, the student should analyze the differential diagnosis by comparing and contrasting the possibilities. In step 4, the student should probe the preceptor by asking questions about ambiguities and alternative approaches. In step 5, the student should make a plan for the patient's medical problem. In step 6, the student should select a case-related issue for self-directed learning. During the first day of training, students in the SNAPPS group received information regarding this method, and their questions about the method were answered. On the same day, the preceptor presented a few cases according to the 6 steps of the SNAPPS method.

### Measurements

A questionnaire was used to gather the socio-economic information of students. A checklist was used to record the students' final assessment. This checklist was prepared according to the Nursing and Midwifery school evaluation form that is in use to evaluate midwifery students' clinical skills in gynecology. This evaluation form was composed according to the learning theory syllabus of gynecology [7]. The checklist in-

cluded 56 questions (Supplement 1). A 5-item Likert scale was used for scoring, ranging from 0 to 4, where 4 indicated a very high level of skill and 0 indicated an unacceptable level of skill. The assessment in both groups was performed by a preceptor who was not aware of the purpose of this study. The validity of both the socio-demographic questionnaire and the checklist was measured by content validation.

### Statistical analysis

All data were analyzed using IBM SPSS ver. 21.0 (IBM Co., Armonk, NY, USA). An independent t-test was used to compare means between the 2 groups. Categorical data were compared using the chi-square test.

### Ethical approval

The study was approved by the Ethics Committee of Ahvaz Jundisahpur University of Medical Sciences (Ref no: AJUMS.REC.1394.83).

The mean age of participants was  $22.38 \pm 1.03$  years and  $22.57 \pm 0.96$  years in the teacher-centered education and SNAPPS groups, respectively ( $P > 0.05$ ). The mean grade point average of the students' final semester was  $16.99 \pm 0.88$  (min = 16, max = 18.91) and  $17.07 \pm 0.75$  (min = 15.5, max = 18.56) in the teacher-centered education and SNAPPS groups, respectively ( $P > 0.05$ ). Most students in both groups lived in dormitories (77.8% in the teacher-centered education method group and 73.7% in the SNAPPS group;  $P > 0.05$ ). As evident from Table 1, ability to gain the trust of the patient and verbal and nonverbal communication skills, history taking ( $P = 0.001$ ), gynecological history taking ( $P = 0.002$ ), and total score of history taking ( $P = 0.001$ ) were significantly better in the SNAPPS group compared with the teacher-centered education group ( $P < 0.01$ ). The students in the SNAPPS group were better able to prepare the patient for gynecological examination ( $P = 0.006$ ) and exhibited better observance of the principles of sexually transmitted disease prevention ( $P < 0.001$ ). The 2 groups did not show any significant difference in the students' ability to perform an examination of the external and internal genitalia, to insert a spec-

**Table 1.** The mean score of students in the history taking in the teacher-centered education and SNAPPS groups in 2015, Iran

Variable	Teacher-centered education group (n = 18)	SNAPPS group (n = 18)	P-value
The ability of student to gain the trust of patients	$5 \pm 1.41$	$7.1 \pm 1.38$	0.006
Verbal and nonverbal skills of students in communicating with patients	$5 \pm 1.41$	$7.1 \pm 1.38$	< 0.001
The ability of student in taking patients' general history	$3.7 \pm 2.81$	$6.8 \pm 2.14$	0.001
The ability of student in taking patients' gynecological history	$7.6 \pm 2.95$	$10.7 \pm 2.07$	0.002
Total score of history taking	$21.66 \pm 6.87$	$30.26 \pm 7.16$	0.001

Values are presented as mean  $\pm$  standard deviation.

SNAPPS, summarize, narrow, analyze, probe, plan, and select.

ulum with minimal discomfort, to comply with sterilization procedures in pelvic examination, and to consider preventive measures when assessing patients affected with vaginitis and cervicitis or when taking a pap smear (Table 2). The 2 groups did not show any significant difference in para-clinical mea-

asures except for 'ability to read and interpret the results of para-clinical measures' ( $P = 0.01$ ) (Table 3). Raw data is available in Supplement 2.

The students in the SNAPPS group were better able to diagnose common diseases ( $P < 0.05$ ) (Table 4). The SNAPPS meth-

**Table 2.** The mean scores of students in clinical examination in the teacher-centered education and SNAPPS groups in 2015, Iran

Variable	Teacher-centered education group (n = 18)	SNAPPS group (n = 18)	P-value
The ability of student to prepare patients for gynecological examination	3.8 ± 1.6	5.3 ± 1.64	< 0.006
The ability of student in the examination of external genitalia	6.1 ± 3.16	7.7 ± 1.52	0.14
The ability of student in the examination of internal genitalia	7.3 ± 2.76	8.2 ± 1.96	0.25
The ability of student in the insertion of speculum with minimal discomfort	8 ± 3.41	8.3 ± 2.56	0.73
The ability of student to comply with sterile procedures in pelvic examination	6 ± 1.18	6.4 ± 1.07	0.28
The ability of student in preventive principles of vaginitis during examination	2.7 ± 0.89	2.8 ± 0.65	0.52
The ability of student in preventive principles of cervicitis during examination	2.7 ± 0.94	2.8 ± 0.56	0.88
The ability of student in preventive principles during pap smear	2.8 ± 0.7	2.8 ± 0.45	0.89
The ability of student in preventive principles of sexually transmitted diseases	7 ± 1.7	9 ± 1	< 0.001
Total score of clinical examination	46.6 ± 9.4	49.8 ± 7.6	0.25

Values are presented as mean ± standard deviation.

SNAPPS, summarize, narrow, analyze, probe, plan, and select.

**Table 3.** The ability of students in para-clinical measures in the teacher-centered education and SNAPPS methods in 2015, Iran

Variable	Teacher-centered education group (n = 18)	SNAPPS group (n = 18)	P-value
The ability of student in performing of pap smear	5.1 ± 4.2	7.2 ± 3.3	0.28
The ability of students in reading and interpretation of semen analysis	1.55 ± 1.14	1.42 ± 0.83	0.66
The ability of students in para-clinical measures	5.5 ± 3.6	7.5 ± 2.89	0.06
The ability of students in reading and interpreting the results of para-clinical measures	4 ± 3.56	6.7 ± 3.13	0.01
The total score	19.22 ± 8.7	24.15 ± 7.8	0.07

Values are presented as mean ± standard deviation.

SNAPPS, summarize, narrow, analyze, probe, plan, and select.

**Table 4.** Comparison the scores obtained by students in the differential diagnosis in teacher-centered education and SNAPPS groups in 2015, Iran

Variable	Teacher-centered education group (n = 18)	SNAPPS group (n = 18)	P-value
The ability of student in interpretation of pap smear	7 ± 3.08	9.9 ± 2.46	0.10
The ability of student in diagnosis of vaginitis	5 ± 3.08	8.2 ± 2.8	0.003
The ability of student in diagnosis of cervicitis	4.8 ± 3.72	7.2 ± 1.82	0.01
The ability of student in diagnosis of breast diseases	3.8 ± 2.47	5.5 ± 2.06	0.03
The ability of student in diagnosis of abnormal uterine bleeding	7.8 ± 3.11	9 ± 3	0.23
The ability of student in diagnosis of dysmenorrhea	3.6 ± 2.58	6.8 ± 1.53	< 0.001
The ability of student in diagnosis of premenstrual syndrome	6.5 ± 2.95	7.7 ± 2.3	0.16
The ability of student in diagnosis of sexually transmitted disease	3.2 ± 1.83	4.1 ± 1.82	0.18
The ability of student in diagnosis of postmenopausal disorders	7.1 ± 2.09	7.1 ± 2.28	1
The ability of student in diagnosis of pelvic floor relaxation	4.1 ± 2.46	4 ± 1.7	0.65
The ability of student in diagnosis of hirsutism	2.6 ± 0.91	2.6 ± 0.82	0.73
The total score of differential diagnosis	57.83 ± 17.62	74.94 ± 16.5	0.004

Values are presented as mean ± standard deviation.

SNAPPS, summarize, narrow, analyze, probe, plan, and select.

**Table 5.** The comparison of scores obtained by students in correct manner for treatment in the teacher-centered education and SNAPPS methods in 2015, Iran

Variable	Teacher-centered education group (n = 18)	SNAPPS group (n = 18)	P-value
The ability of student in treatment of vaginitis	6.3 ± 3.06	8.6 ± 3.1	0.03
The ability of student in treatment of different types of cervicitis	6 ± 4.1	9 ± 2.6	0.02
The ability of student in treatment of breast diseases	1.7 ± 2.04	3.05 ± 1.3	0.01
The ability of student in treatment of abnormal uterine bleedings	2.5 ± 2.5	3.5 ± 1.7	0.10
The ability of student in treatment of dysmenorrhea	8 ± 3.2	9 ± 2.6	0.36
The ability of student in treatment of premenstrual syndrome	2.6 ± 2.2	4.1 ± 2	0.05
The ability of student in treatment of sexually transmitted disease	6.3 ± 3.3	7.5 ± 2.5	0.25
The ability of student in refereeing of patients with urinary incontinence	1.3 ± 1.09	1.7 ± 0.8	0.34
The ability of student in treatment of postmenopausal women	4.5 ± 2.2	4.1 ± 1.6	0.34
The ability of student in treatment of pelvic relaxation	1.2 ± 1.1	1.6 ± 0.8	0.11
The ability of student in refereeing patients with hirsutism	1.8 ± 1.1	2.1 ± 1.1	0.44
The ability of student in prescription	3.3 ± 2.6	6.1 ± 2.05	0.002
The total score of correct manner for treatment	45.88 ± 15.8	55.68 ± 2.03	0.11

Values are presented as mean ± standard deviation.

SNAPPS, summarize, narrow, analyze, probe, plan, and select.

od significantly improved the ability of students in the treatment of common diseases ( $P < 0.05$ ) (Table 5).

The results of this study showed that SNAPPS increased students' ability in history taking, preparing the patient for gynecological examination, and observing the principles of sexually transmitted disease prevention. The SNAPPS group was significantly better in reading and interpreting the results of para-clinical measures and in the diagnosis and treatment of common diseases. Other studies have also shown that teacher-centered methods may not be able to educate and evaluate students, especially in the clinical setting. The SNAPPS method is a type of constructive learning in which students are treated as thinkers who are able to develop new knowledge and teachers are treated as learning partners for the students, while in the traditional method teachers are responsible for conveying information to students and providing the correct answer to students' questions [8].

Learning preferences such as a person's characteristic patterns of strengths, weaknesses and preferences in absorbing, processing, and retrieving information differed among students and these differences may have affected the results of this study. In conclusion, the results of this study showed that the SNAPPS education method can significantly improve midwifery students' skills in gynecology, namely history taking and differential diagnosis and treatment of common diseases.

**ORCID:** Parvin Abedi: <http://orcid.org/0000-0002-6980-0693>; Hamideh Barangard: <http://orcid.org/0000-0002-4816-0500>; Poorandokht Afshari: <http://orcid.org/0000-0002-3383-9908>

## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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## Supplementary materials

Supplement 1. The Nursing and Midwifery school evaluation form that is in use to evaluate midwifery students' clinical skills in gynecology at Imam Khomeini Hospital, Ahvaz, Iran

Supplement 2. Raw data of this study.

Supplement 3. Audio recording of the abstract.

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