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The Evaluation of Functional Quality in Bachelor Midwifery Students based on Objective Structured Clinical Examination (OSCE) in Islamic Azad University-Mashhad Branch

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Abstract

Introduction: Objective Structured Clinical Examination (OSCE) is one of the standardized and accepted methods for the certification of undergraduate midwifery in the world. OSCE is a type of examination often used in health sciences (e.g. midwifery), which is designed to test clinical skill performance and competence in skills such as clinical examination, medical procedures / prescription, exercise prescription, manipulation techniques. The aim of this study is to evaluate the quality of midwifery students' performance before the final exam through the OSCE method in Islamic Azad University of Mashhad.

Methods: This cross-sectional study was conducted in the summer of 1396 on 75 midwifery students before entering the final exam. Checklists for evaluation of skills were analyzed by the experts' panel to increase the validity of checklists. For examining the reliability of the exam in studied population, the spilt-half method was used. Evaluation of the quality of students' performance in various areas of pregnancy and childbirth, gynecological diseases, maternal and child health and they were carried out at three levels of diagnosis, decision making and therapeutic interventions. The exam was also carried out in 12 sections along with a rest one.

Results: 75 volunteers were divided equally according existing stations. 89/3% were under the age of 25 years old 48% were single and 52% were married. The average score was calculated, when the students were able to answer 50% of the items in each domain. If the volunteer answered more than 50% of the items, she would be in good shape, while the volunteer answered fewer than 50% of the items, she would be weak. The performance of midwifery students was moderate and good at all stations except for Pap smear in gynecology domain, fetal health evaluation in pregnancy and childbirth domain, and Vaccination in maternal and child health domain. (PV<0.848, PV<0.666, PV<0.711 respectively both diagnosis and decision making level.

Conclusions: Since the OSCE examines the strengths and weaknesses of students, this study indicated that weakness of midwifery students of Mashhad Azad University lied in some important areas such as, fetal health evaluation, Pap smear and Vaccination which should be more considered and emphasized on by the instructors and educational planners.

INTRODUCTION

Clinical education in midwifery profession is of absolute importance because of numerous clinical courses alongside the theoretical lessons [1]. However, the high status of midwifery position in Millennium Development Goals, relates to the improvement of clinical education therefore, several examination of

midwifery students is required to prove its success [2]. More than 50% of midwifery students' lessons have been practically defined in Iran [3]. One of the most creditable accepted functional method for evaluation of clinical function of students in the field of medical sciences is Objective Structured Clinical Examination (OSCE). OSCE in midwifery is important in developed countries so that it is as essential item for students' graduation and enrolling to clinical stage in hospitals [4]. Now, OSCE is considered as a new method in the field of health, medicine and clinical environments [4, 5]. To approve of educational goals in midwifery students can be determined in clinical statues. OSCE create a suitable opportunity similar to the real situation in clinical field [5]. Also OSCE makes an equal condition for students so it can provide more satisfaction for them [5, 6]. Although OSCE has a lot of advantages from educational aspect, but taking a long time, high cost and being hard for doing can be considered as disadvantages, which might be ignored when comparison to unique benefits [5].

OSCE is a practical-based modern evaluation method that makes a comprehensive evaluation to detect knowledge, behavioral and decision making skills in real situations [6].

This exam was developed for the first time by Harden and Glyson in 1970, but today it has become an important tool in the fields of health, education and clinical aspects [7].

Since, enough criteria for the recognition of clinical performance, cannot be achieved just by taking only the final clinical exam from the students, Objective Structured Clinical Examination or OSCE, which is one of the modern methods of evaluation and it is based on performance can be ustilized. It pays more attention to the objective and comprehensive evaluation of practical knowledge and skills that the students show and the decisions they make in real situations [6].

The motivation behind conducting this research before the final exam was to determine the ability of the students in three areas of diagnosis, decision making and appropriate treatment of patients in different domains of pregnancy, childbirth, prenatal and maternal cares and child health.

Therefore, Islamic Azad University of Mashhad in process of achieving its educational goals, has been performing OSCE for few years. According to the limitations of evaluation and diagnostic functions of assessment in emergency situations in clinical environment, OSCE provides this opportunity to evaluate the situations in environments similar to clinic. So this study was designed with general purpose of functional quality evaluation of midwifery students in obstetric emergency situations. Also its specific objectives were recognition the power of diagnosis, decisions making and appropriate treatment of midwifery students in circumstances similar to clinic.

METHODS

This study is a cross-sectional study which is conducted on 75 students of midwifery before entering the final exam in the summer of 2016. The study population included all midwifery students who were accepted in entrance exam. The members of this expertized panel were 13 people consisted of 2 educational experts (with more than 25 years of experiences), 7 Master of Science students in the field of midwifery education and scientific council of reproductive health (with more than 10 years of training), 2 professors in reproductive health and bio-technology and 2 students of PhD in reproductive health. In order to perform the OSCE, in consultation session, at first the members of midwifery group were requested to express their points of view to enhance the validity of the exam collaboratively. Then we studied the variety of sources in evaluation through OSCE in order to prepare the list of various domains of evaluation and develop a checklist of emergency situations, in different fields. When the checklists were prepared, they were attempted to operationally coincide the obstetric emergency cases with OSCE. Checklists were prepared and categorized based on Likert scale on three levels: weak, moderate and good. In another session, for more coordination between the members and screening questions, a panel of experts was set up to analyze and correct the questions. Therefore, out of 35 questions which are designed in the initial stages, 11 questions were finally accepted. Then checklists were evaluated and analyzed by the panel to increase their validity, which led to the final reforms of the questions. The validity of the exam was confirmed by the professors and the experts of this skill.

To examine the reliability of the exam in the studied population, the spilt-half method was used. In this method, the scores of individual and paired stations were obtained. The correlation coefficient between the scores of the paired and individual stations were calculated, and Spearman-Brown correlation coefficient was also calculated, which was equal to 0.77. Then the reliability of the above exam was also confirmed. To resolve any questions and doubts, a briefing session was conducted on the day before the exam for the students and the stages of the work were described for them. Also to familiarize the students with sample questions, checklists and test fields, the numbers of stations and scheduling was announced at the each station in the midwifery group and the students became familiar with the exam circumstances and the environment online.

The exam was also carried out with 12 sections along with a rest section. These sections included: emergency conditions, neonatal resuscitation, postpartum hemorrhage control, preeclampsia management, Intra Uterine Growth Retardation (IUGR), the breast examination with a suspicious nodule, inserting and removing of Intra Uterine Device (IUD) and abnormal Pap smear. A section was also dedicated for rest. The

high number of sections increased the recognition of students' performance and helped increase the validity and stability of the exam. At each section, a master examines students' performance in recognition and functional domains from a weak level to a good one. Students were divided into equal groups and were evaluated at each section within 5 minutes. The security of exam was maintained by quarantining the students in the proper room and the students were taught to avoid any verbal communication irrelevant to the corresponding master at each section.

RESULTS

From 75 participants in the exam, vast majority of them (89.3%) were under the age of 25 years old, 5 (6.7%) were between 25-30, 1 (3.1%) was between 30-35 and 2 (7.2%) were over 35. 36 people (48%) were single and 39 (52%) married. 8 people of volunteers (10.7) were at 8th semester, 47 (62.7%) were at 9th, 7 (9.3%) were at 10th, 8 (10.7%) were at 11th, 3 (4%) were at the 12th, who had prolonged their education for some reasons, such as taking a leave. 75 volunteers were divided equally according the existing sections. At each section the qualitative Likert scale was used which was either weak, moderate or good and all of the evaluations were based on three levels of diagnosis, decision making ability and use of correct therapy. The average score was concluded, when the students were able to answer 50% of the items in each domain. If the volunteer answered more than 50% of the items, they would be in classified under good level, while the volunteers answered fewer than 50% of the items, were classified under weak level.

Table 1: Mean score in Deferent Stations

Stations	Mean score in diagnosis	Mean score in decision making	Mean score in intervention therapy	Total Mean
Leopold maneuver	2.17±0.74	2.15±0.73	2.48±0.60	2.27±0.54
Pap Smear	1.83±0.66	1.83±0.66	2.31±0.73	1.99±0.6
PPH management	2.55±0.7	2.07±0.74	2.48±0.72	2.36±0.58
Evaluation of fetal health	1.85±0.75	1.85±0.75	2.19±0.8	1.96±0.71
Breast examination	2.36±0.51	2.68±0.5	2.27±0.58	2.43±0.38
Infant growth	2.16±0.59	2.49±0.63	2.32±0.5	2.32±0.37
Prenatal Tests	2.63±0.54	2.33±0.72	2.55±0.68	2.5±0.53
Inserting and removing of IUD	2.68±0.57	2.64±0.61	2.49±0.72	2.6±0.5
Newborn resuscitation	2.25±0.68	1.77±0.76	2.35±0.6	2.12±0.49
Vaccination	1.97±0.7	1.99±0.67	2.11±0.78	2.03±0.63
Preeclampsia management	2.17±0.6	1.83±0.72	2.40±0.68	2.13±0.51
Total stations	2.24±0.18	2.15±0.2	2.36±0.22	2.25±0.18

Table 2: The Functional Status of Midwifery Students in Different Stations

Stations	Mean scores	T-test	P-value
Leopold Maneuver	2.27	4.257	0.000
Pap Smear	1.99	0.193-	0.848
PPH management	2.36	5.462	0.000
Evaluation of fetal health	1.96	0.433-	0.666
Breast examination	2.43	9.938	0.000
Infant growth	2.32	7.481	0.000
Prenatal Tests	2.5	8.258	0.000
Inserting and removing of IUD	2.6	10.442	0.000
Newborn resuscitation	2.12	2.175	0.033
Vaccination	2.03	0.371	0.711
Preeclampsia management	2.13	2.259	0.027
Total stations	2.25	12.44	0.000

According to the results of the one sample T-test, (the normality of the variables confirmed by the Kolmogorov-Smirnov test), the above table indicates the probability amount of the test for the scores in all the sections except for the Pap smear, fetal health evaluation and Vaccination which were less than 0.05. Therefore, the volunteers performed well at all sections except for Pap smear, fetal health evaluation and Vaccination. According to the results obtained from the one sample T-test (The normality of the variables confirmed by Kolmogorov-Smirnov test), the above table indicates the students' performance in different levels. According those tables, students functional **is** significantly weak at Pap smear station in all domains. Also, they were weak in decision making level for newborn resuscitation, vaccination and preeclampsia management. Midwifery students were significantly good in PPH management, fetal health evaluation, breast examination, prenatal tests, inserting and removing IUD.

DISCUSSION

The aim of this study was to evaluate the clinical performance of midwifery students before entering the final exam at Islamic Azad university of Mashhad which indicated that the midwifery students' performance is at a good and moderate level at all sections except for Pap smear, Fetal health evaluation, Vaccination and Preeclampsia management. Moreover, by examining the

obtained results from the test sections, it was observed that at the breast examination, infant growth curve, prenatal tests and inserting and removing IUD stations, the status of the students was good in all the 3 stages. However, there is a serious weakness in the neonatal resuscitation and preeclampsia management sections in the stage of decision making. The weakness in clinical skills and theoretical education has long been considered by the researchers [8-10].

Table 3: Average Scores on Different Stations on Deferent Level

level	Mean score	T- Test	P-Value
Leopold Maneuvers			
Diagnosis	2.17	2.02	0.047
Decision making	2.15	1.74	0.086
Therapeutic interventions	2.48	6.92	0.000
Pap Smear			
Diagnosis	1.83	2.26-	0.027
Decision making	1.83	2.26-	0.027
Therapeutic interventions	2.31	3.61	0.001
Postpartum hemorrhage management			
Diagnosis	2.55	6.73	0.000
Decision making	2.06	0.78	0.439
Therapeutic interventions	2.48	5.75	0.000
Evaluation of fetal health			
Diagnosis	1.85	1.70-	0.094
Decision making	1.85	1.70-	0.094
Therapeutic interventions	2.19	2.02	0.047
Breast examination			
Diagnosis	2.36	6.11	0.000
Decision making	2.68	11.84	0.000
Therapeutic interventions	2.27	4	0.000
Infant growth			
Diagnosis	2.16	2.33	0.022
Decision making	2.49	6.85	0.000
Therapeutic interventions	2.32	5.57	0.000
Prenatal Tests			
Diagnosis	2.63	10.06	0.000
Decision making	2.33	3.99	0.000
Therapeutic interventions	2.55	6.92	0.000
Inserting and removing of IUD			
Diagnosis	2.68	10.27	0.000
Decision making	2.64	9.13	0.000
Therapeutic interventions	2.49	5.9	0.000
Newborn resuscitation			
Diagnosis	2.25	3.23	0.002
Decision making	1.77	2.57-	0.012
Therapeutic interventions	2.35	4.97	0.000
Vaccination			
Diagnosis	1.97	0.33-	0.741
Decision making	1.99	0.17-	0.863
Therapeutic interventions	2.11	1.18	0.241
Preeclampsia Management			
Diagnosis	2.17	2.50	0.015
Decision making	1.83	2.07-	0.042
Therapeutic interventions	2.40	5.11	0.000
Total Stations			
Diagnosis	2.24	11.70	0.000
Decision making	2.15	6.29	0.000
Therapeutic interventions	2.36	14.19	0.000

In 2015, Visogino and his colleagues showed in their research (which was carried out on Ethiopian midwifery students) that the lowest clinical skills of midwifery students were in below average level and only in the labor control of the third stage, they had an appropriate status which was above average. Gaining low scores in the management of emergency conditions by midwifery students has raised concerns for the education staff in that area [11]. Because Ethiopia is among the countries with the highest rates of maternal mortality [12]. In this regard, the results of the present research correspond with the research done by Visagino in the maternity ward. Performing the Objective Structured Clinical Examination is considered as an essential issue for the students graduating in developed countries as well. So that in Ireland, the students who do not success in OSCE exam, will not any probable chance to enter the clinical field [13]. The result of this study indicates that midwifery students had a moderate and good status in the field of prenatal cares. A study which is done by Bahri

and his colleagues in 2014 also showed that the performance of the health care team in the field of prenatal care and during pregnancy was respectively good and moderate [14].

Although the research has not yet been done on students, but the high quality of the performance of the health care team in the field of prenatal care has shown that they were educated well and their competence in this item is acceptable to the educators in the pre-entry period to work. Michel and his colleagues argued in 2013 that performing OSCE before entering of midwifery students to clinical admission could be useful since by identifying the students' weakness in pre-field clinical skills, the opportunity is created for the examiners to fail them [15].

Malakuti and his colleagues also conducted the OSCE exam on midwifery students in Esfahan, University of Medical Sciences in 2017. Their study results are moderate in some items, such as Leopold maneuvers, Breast examination and fetal health evaluation and in Neonatal resuscitation are less than moderate which corresponds with the results of the present study [3].

In their study, gaining more than 50% of the score was considered as acceptable. Although most critics of performing this method in evaluation of students' performance argue: the method of this exam is so much stressful and that's why they consider this as an indicator to reduce the performance of the students, but others repeat these types of exams in order to increase the confidence of students in medical sciences [16-19].

In the present study, most students admitted that stressful conditions in the exam room were the most important reason for the reduction of their clinical performance (it is noteworthy to mention that it was attempted to modify this stressful situation by performing a pre-test justification class). One of the other items which were conducted in this study was inserting and removing IUD section. The status of midwifery students at the section was moderate functionally. Erfanian and his colleagues in 2011 during their study in Mashhad University of Medical Sciences addressed this item into number of sections, such as counseling before inserting the IUD inserting it into uterus, removing and managing the complications after insertion. Their results showed that the status of inserting and its removal in the 62 midwifery students who were tested was weak [20]. Perhaps, the reason for this difference is related to the students' conditions because research samples were in the second to fourth year of their midwifery major and therefore they were not equal educationally, but the present research participants were all at one level and were prepared for the final exam.

One of the strengths of the present research is the diverse stations and also the coverage of all midwifery domains including pregnancy, child birth, gynecology, maternal and child health and prenatal care. Also it can be mentioned, the students who were prepared for final exam were all equal educationally. A high sample size can also point to research strengths. On the other hand, formative of expert panel for qualitative evaluation of the questions and selection of better questions can be considered as the strengths of research. Also the study of functional status in 3 domains of diagnosis, decision and therapeutic interventions with qualitative methods can be considered as the strengths of the study.

Limitations

One of the weaknesses in the research is the impossibility of measuring the stress of the students at different sessions. Also, the lack of control of stressful conditions in exam somehow could affect the performance of the students.

CONCLUSIONS

Since the OSCE examines the strengths and weaknesses of the students in terms of educational status, the weakness of midwifery students in Mashhad Azad University is noted and emphasized on by the masters and educational planners in some emergency items such as fetal health evaluation, Neonatal resuscitation, Breast diseases, Pap smear and IUGR management. On the other hand, the repetition of OSCE exam in each year, in addition to reducing the stress levels of students as they become more familiar with the educational environment, can help screen the students better in order to prepare them for final exam.

ETHICAL CONSIDERATION

The rights of the partners and the failure to reveal the names and specifications are considered of the authors. Also informing them about the research and obtaining the verbal conscious satisfaction is one of the important ethical issues.

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CONFLICTS OF INTEREST

The authors do not have any potential and non-potential conflicts of interset.

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AUTHOR'S CONTRIBUTION

FE, TFN, MA and NR: Designed and performed first draft.

NR and MA: Analyzed data and co-wrote the paper.

TFN: Wrote the final draft.

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