

**Comparing the quality of preconception care provided in healthcare centers in Mashhad in 2012**Fatemeh Ghaffari Sardasht<sup>1</sup>, Nahid Jahani Shourab<sup>2</sup>, Farzaneh Jafarnejad<sup>2</sup>, Habibollah Esmaily<sup>3</sup>

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**Type of article:** Research article

**Abstract**

**Background:** Improving the quality of healthcare services is considered as the main strategy to improve maternal and neonatal health outcomes. Providing appropriate healthcare for mothers and their newborn children is facilitated significantly by considering the mothers' health and welfare before pregnancy occurs. Therefore, the aim of this study was to compare the quality of preconception care provided to women of reproductive age provided by five health centers in Mashhad in 2012 and 2013.

**Methods:** Multi-stage sampling was used to select the participants in this descriptive study. As a result, 360 women of reproductive age and 39 healthcare providers from 24 healthcare centers in Mashhad were selected to participate. The data gathering tool was a checklist based on the Donabedian model that includes the three dimensions of structure, process, and outcome. The data were analyzed by SPSS software (version 11.5), Kruskal-Wallis tests, ANOVA, and Spearman rank correlation.

**Results:** The results showed that preconception care at the 24 healthcare centers had essentially the same conditions. But in the process and outcome components, the quality of the preconception care at five of the health centers was significantly different ( $p=0.008$ ). The highest quality of care processes was identified at health center number 3. The difference in the component of outcomes being followed up by the healthcare providers at five of the health centers was statistically significant ( $p=0.000$ ); however, there were no significant differences found among the satisfaction and awareness of the women who participated at the five health centers.

**Conclusion:** The results showed that the performance of health personnel in providing preconception care and providing follow-up care was not satisfactory.

**Keywords:** Quality of care; Preconception care; Reproductive age women; Healthcare centers

**1. Introduction**

After the implementation of the first prenatal care in the late 1930s in England and Northern Ireland (1), little by little, it has become recognized that there is a gap in the continuum of maternal care and that preconception care, which is the missing link in this continuum, can improve pregnancy outcomes, parturition, and children's health (2). Pregnancy is one of the most important experiences of a woman's life, and planning for pregnancy is one of the best solutions to solve problems related to pregnancy, to create a safe pregnancy, and to maintain and improve the health of mothers and their children (3). Preconception care, as part of antenatal care, is a golden opportunity that can identify risk factors in pregnancy and conduct any required interventions before pregnancy occurs (4). Various

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Received: February 21, 2015, Accepted: March 24, 2015, Published: June 05, 2015

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studies have shown that poor access to prenatal care is a major obstacle to improving pregnancy outcomes. Given that a significant number of women in developing countries are receiving prenatal care, there is growing evidence to show that mere access to care is not enough; rather, the quality of that care is a key component to improve health outcomes for both the mother and the baby (5). The quality obstetrics care has a huge impact on the outcome of pregnancy and childbirth (6). During pregnancy, all women experience some mental and physical changes that may affect the outcome of pregnancy. The mother's age is one factor that can, in some cases, increase the risk associated with pregnancy. Today, throughout the world, teenage girls are getting married in increasing numbers, especially in developing countries (7). In Iran, teenage girls give birth to 100,000 babies annually. Census data show that in 2011, 1.8% of females between the ages of 10 and 14 were married, and 21% of those between the ages of 15 and 19 were married. Among the provinces, Khorasan Razavi Province has the highest percentage of females between the ages of 10 and 14 who are married, as well as the highest percentage of those between 15 and 19 who are married (8).

The young age of females during pregnancy is considered as an important factor of adverse outcomes. Research shows that the majority of teenage females' pregnancies are unplanned, and teenagers rarely are referred to preconception counseling. Since the age at marriage is relatively low and pregnancy occurs frequently among these very young females (9), the researchers decided to conduct a study in Mashhad, which has the highest population of reproductive age women among the other cities of Khorasan Razavi Province, to evaluate and compare the quality of preconception care provided to reproductive age women in healthcare centers and to identify the strengths and weaknesses of such care in the city's health centers. The Donabedian model was chosen to evaluate the quality of such care, because it focuses on the final results of patient care (10). This model is the most extensively used model in the evaluation of healthcare (1), and it was first presented in 1966 to address three areas, i.e., structure, process, and outcome (11). Some other research also has been conducted using this model. For example, it was used in studies in India (12) and Kenya (13) to compare the quality of antenatal care in the public and private sectors of the two countries.

## **2. Materials and Methods**

### *2.1. Research design and sampling*

This cross sectional study was conducted in healthcare centers covered by five health centers in Mashhad, Khorasan Razavi Province, Iran. Three hundred and sixty reproductive age women who were referred to 24 healthcare centers covered by five health centers to receive preconception care were selected for study. In addition, 39 health staff who worked in these centers providing preconception care participated in the study. Since our literature review indicated that no study similar to the present investigation had been published, we conducted a pilot study that involved 30 women of reproductive age to calculate the sample size. Then, the sample size was determined by the following formula in all three components, i.e., structure, process, and outcome. Since the estimated sample size was based on knowledge of the consequence component, the same index was considered as the sample size, and the 95% confidence and 5% accuracy levels were calculated for about 360 persons.

Multi-stage sampling was performed at the healthcare centers. The five health centers in Mashhad were considered categories, and the names of the covered healthcare centers were listed and considered as clusters. Then, by using the following formula and considering the covered population, each of the five health centers was considered to be a quota (105 subjects at health center number one, 75 subjects at health center number two, 90 subjects at health center number three, 15 subjects at health center number four, and 75 subjects at health center number five). With regard to the quota and in proportion to the number of healthcare centers in urban areas covered by the five centers, a number of clusters was selected by lottery (including seven clusters from health center number one, five clusters from health center number two, six clusters from health center number three, one cluster from health center number four, and five clusters from health center number five). Among all of the reproductive age women who were referred to the desired healthcare centers to receive preconception care, subjects were selected to participate in the study by using the availability criteria.

### *2.2. Measurement tools*

The tools used in this study were developed by the researchers, and they included two checklists to examine the structure and the process of care. The forms of care outcomes also included a questionnaire concerning the study units' satisfaction with the care that was provided, e, a questionnaire concerning the study units' knowledge about preconception care, and a follow-up form of care performed by the healthcare providers. The checklist of used to evaluate quality structure consisted of 65 questions in three parts, which examined the physical infrastructure, the

human infrastructure, and organizing the forces. Answers to the checklist were in form of “have” and “not have.” Any option that was available at the healthcare center was awarded “point A,” and no “zero point” was available. (It should be noted that for each question in the checklist of care, levels 1 to 3, was considered, and their priority was determined based on the views of professors, numerous articles in the field of antenatal services, and the standards of care centers according to their priorities in providing preconception care.) Then, the total points were calculated to compare the percentage in three levels, i.e., 0 to 33% as poor quality, 34 to 66% as moderate quality, and 67 to 100% as good quality. The checklist used to evaluate the quality process consisted of 42 questions related to both technical performance and interpersonal care interactions. Each question examined in the checklist was scored in one of three forms, i.e., “done” (2), “incompletely done” (1), and “not done” (0). An option of “no problem” also was available. If, during the viewing, any of the questions did not need to be answered, that option was marked, and the question was not included in calculating of the scores. The data that were from the checklist were calculated to compare with a good level in percentage terms, i.e., 0 to 33% as poor quality, 34 to 66% as moderate quality, and 67 to 100% as good quality. Then satisfaction questionnaire contained 28 questions, four of which dealt with the subjects’ level of satisfaction, i.e., 1) satisfaction with the care structure, 2) satisfaction with counseling and care, 3) satisfaction with the training that was provided, and 4) satisfaction with the physician. The questions were scored using a five-point Likert scale of completely agree (4), agree (3), no idea (2), disagree (1), and strongly disagree (0), and the range of scores was considered between 0 to 112. The data obtained from the questionnaire were estimated in terms of percentage in four levels, i.e., 0 to 25% as strongly dissatisfied and dissatisfied, 26 to 50% as neutral, 51 to 75% as satisfied, and 76 to 100% as strongly satisfied. The knowledge questionnaire contained 30 questions. For correct answer to each question “one score” and for each wrong answer or not know, “zero score” was considered. The data obtained from the questionnaire were estimated at three levels, i.e., 0 to 33% as poor knowledge, 34 to 66% as moderate knowledge, and 67 to 100% as appropriate knowledge. The follow-up form contained four questions and answers to the given questions in either “Yes (2)” or “No (0).” The data obtained from the form were estimated to compare with the good level in terms of percentage in the three levels of 0 to 33% as poor follow-up, 34 to 66% as average follow-up, and 67 to 100% as desired follow-up.

The content validity method was used to validate all of the instruments used in the study. The instruments were given to 10 experts who were professors of Mashhad University of Medical Sciences and Research to evaluate. After the tools were revised based on their comments, they were used in the study. To make them reliable, the form of related information to the characteristics of the care provider was confirmed by a test-retest method with the correlation of 0.90, 10 days later. The form of the information related to the characteristics of the healthcare center was confirmed by the equivalent fraction method with the correlation of 0.92. The reliability of the checklist of structure quality evaluation was confirmed by the equivalent fraction method with the correlation of 0.85. The reliability of the checklist of process quality evaluation and the reliability of these tools were confirmed by the equivalent fraction method with the correlation of 0.80. The reliability of knowledge and satisfaction questionnaire was confirmed by Chronbach’s alpha with alpha score of 0.89 and 0.70, respectively. The reliability of the tracking form was confirmed by Chronbach’s alpha with an alpha score of 0.89.

### *2.3. Data collection*

After the research was approved by the Ethics Committee and after an introduction letter was obtained from the Nursery and Midwifery University of Mashhad, these documents were presented to the authorities of the five health centers in Mashhad, and the researcher visited the healthcare centers. Generally, this study was performed in the following five steps:

- 1) After coordinating with the heads of the five health centers and the authorities at the selected healthcare centers, the characteristics form was given to healthcare providers. The researcher also completed the characteristics forms of the healthcare center using the information available in the family planning offices and the statistical forms that were available in the obstetrics and family health units with the help of the personnel in these units. In addition, the researcher completed the structural evaluation form of the care that was provided while the researcher was at the center for observation and conducted interviews with the personnel who were available at the selected healthcare centers.
- 2) In the later stages, the researcher went to one center every day. The researcher identified the women who met the inclusion criteria of the study, and, after obtaining written consent and emphasizing the confidentiality of information to the research units, the women were given information about the purpose, the procedure, the method, and the way to answer the questionnaires. Then, the researcher completed the personal and obstetric characteristics form by conducting interviews with the appropriate people in the research units.

- 3) In the third step, the researcher visited the care center with the research unit while care was being provided and wrote his observations related to healthcare provider's function, the relationship between the healthcare provider and the subjects, and the referees in the related checklist.
- 4) After the caring process was completed by the healthcare provider, the physician, the dentist at the center, and the woman who received the care were asked to answer the satisfaction and awareness questionnaire.
- 5) In the last step, after completing the period during which care was being provided, the researcher evaluated the follow-up.

#### *2.4. Ethical considerations*

This study was conducted at the Mashhad University of Medical Sciences with the approval of the University's Research Ethics Committee. The researcher explained the purpose of the study and the procedures that would be used in the research to the healthcare providers and gave them the written informed consent of participation in the study. The data that were collected were deemed to be confidential, and the participants in the study were informed that they could withdraw from the study at any time if they desired to do so.

#### *2.5. Statistical analyses*

Descriptive and inferential statistics were used to analyze the data. After the data were collected, coded, and entered in the computer, they were analyzed by SPSS version 11.5 (SPSS Inc. Chicago Illinois, United States of America). By the Kolmogorov-Smirnov test, the normal distributions of the quantitative variables were determined. If a variable had a normal distribution, parametric tests were used; otherwise, nonparametric tests were used. Statistical indicators, such as mean, standard deviation, and frequency tables, were used to describe the personal, obstetric information of the healthcare provider and the characteristics of the healthcare center. The Spearman correlation coefficient was used to investigate the correlation of the quantitative data if they had an abnormal distribution, and the Pearson correlation coefficient was used if they had a normal distribution. The relationship between the qualitative data and the score of the care structure was determined by the statistical parametric independent t-tests and ANOVA, and the relationship of the qualitative data with the score of the care process was determined with the statistical non-parametric Mann-Whitney and Kruskal-Wallis statistical tests. The relationship of the qualitative data with the satisfaction and awareness of the participants was determined by the statistical parametric independent t-tests and ANOVA. It is noteworthy that the significance level was considered as  $\alpha=0.05$  in the statistical tests.

### **3. Results**

#### *3.1. Demographic findings of reproductive age women*

Three hundred and sixty women of reproductive age participated in this study. The age of the research units was  $5.22\pm 26.93$  years. From an educational perspective, the highest frequencies were related to the two groups of couples at the secondary education level (40 and 44%, respectively), and the lowest frequency was related to ability in reading and writing (which, in the couples, were 1.7 and 2.6%, respectively). The highest frequency of employment status was among women in the housewife group (90.9%), and the lowest frequency was related to the working group (0.6%). The husbands of most of the women in the study were self-employed (59.1%). According to the data, 64.5% of the women were covered by insurances. Fifty-four percent of the research units lived in mortgaged or rental houses. Most women (76.6%) indicated that their income level was adequate. In this study, 67.4% of women had been pregnant, and 18.8% of the women reported that they had experienced complications and disorder in their previous pregnancies. Also, 8.3% of women stated that they had an underlying disease. In the study, 53.6% of the women reported that they had information on preconception care, but 61.5% of them reported that they had very little information.

#### *3.2. Sociodemographic findings of healthcare providers*

The results showed that there were no statistically significant relationships between the mean number of midwives providing healthcare ( $p=0.179$ ). The mean age of providers in the study was  $37.92\pm 6.97$  years. Twenty-nine of the women who were providers (74.4%) had experienced pregnancy and childbirth. Among the 39 healthcare providers who participated in the study, 23 of them (59%) were formally employed, 12.8% were in their commitment period, 20.5% of the employments were in the form of a treaty, and only 3 people (7.7%) were contractor's employees. The average total service time of the healthcare providers in the healthcare sector was  $13.64\pm 7.26$  years. The average number of years that the healthcare providers had been working in mothers' unit was  $4.30\pm 1.15$  years. Among the healthcare workers, 48.7% reported that their previous jobs were at healthcare centers. Among those, 35.9% of them had been transferred from the treatment section to the health section, and 2.6% of them had been working in an

office before being employed in the health section, and 12.8% had no work experience and had almost completed their studies. Among the healthcare providers 48.7% reported that they had participated in teaching preconception care classes in 2011, and the other healthcare providers had not been received any special training except for one course concerning the mothers' integrated care plan.

### 3.3. The quality of triple dimensions of care

To compare the quality of preconception care in the five health centers of Mashhad, first the general quality of care was calculated in the three dimensions of structure, process, and outcome. The results are summarized in Table 1. Then, the results of the quality of provided care were graded and divided into three levels, i.e., poor quality, average quality, and favorable quality. Evaluation of the quality level of the care structure dimension showed that 86.4% of the research centers were satisfactory. Evaluation of the quality level of care process dimension showed preconception care was provided in 94% with average quality. The results in examining the dimension of care outcomes also showed that 95.4% of the women who participated in the study were very satisfied by the services that were provided. Sixty-eight percent of them had average awareness of preconception care, and the follow-up of the care provided by health personnel had a poor level of quality in 65.7% of the cases.

**Table 1.** Mean and standard deviation of the three dimensions of quality of preconception care in the five health centers of Mashhad

Dimension	SD <sup>a</sup> ±Mean	Min, Max	CI <sup>b</sup> (95%)	n
Score of care structure	117.9±11.71	89, 135	107.42-118.93	24
Score of care process	47.92±8.70	15, 81	47.00-48.84	360
Score of satisfaction	75.56±11.84	28, 102	74.32-76.81	360
Score of awareness	14.8±4.53	2, 30	13.70-14.65	360
Score of follow-up	1.62±2.15	0, 8	1.39-1.84	360

a: Standard deviation, b: Confidence interval

### 3.4. The quality of care

The Kruskal-Wallis test showed that there was no difference between the mean score of the care structures in the five centers ( $p=0.112$ ). However, the results of the care process provided by the health personnel at the centers differed (Table 2). The ANOVA showed that there was a significant relationship between the mean score of the care process in the five health centers. The care process provided by the health personnel of healthcare centers covered by the health center number 3 was higher than those of the other centers. In addition, the results of the ANOVA showed that there was no statistically significant difference between the satisfaction mean score of the research units ( $p=0.151$ ) and the awareness mean score of the research units in the five health centers ( $p=0.135$ ). However, the ANOVA results related to the examining follow-up part by the health personnel of the centers showed that there was a statistically significant relationship between the mean care follow-up score in the health centers, and the follow-up of the personnel of health center number 5 was higher in quality.

**Table 2.** Comparison of the mean score of the process and follow-up care provided by the five health centers in Mashhad

Health centers	Process			Follow up		
	SD <sup>a</sup>	Mean	p value	SD	Mean	p value
Health center no. 1	7.03	45.56	0.008	1.85	0.90	0.000
Health center no. 2	6.53	46.39	0.008	2.33	2.04	0.000
Health center no. 3	12.02	52.24	0.008	1.99	1.20	0.000
Health center no. 4	5.18	46.45	0.008	2.00	1.72	0.000
Health center no. 5	6.61	47.90	0.008	2.09	2.64	0.000

<sup>a</sup> Standard deviation

### 3.5. The relationship between the scores given the care process and the characteristics of the care providers

The results were as follows. The Kruskal-Wallis test showed a statistically significant relationship between the mean score of the care process and the healthcare providers' attitudes toward the need for providing preconception care ( $p=0.001$ ). The Spearman correlation coefficients also showed a statistically significant relationship between the experience of the healthcare providers in the mothers' integrated care unit and the mean score of the care process ( $p=0.024$ ). In addition, the results showed that there was a statistically significant relationship between the mean

score of the care process that was provided with the experience of participating in the training courses in antenatal care that were held in 2011 ( $p=0.028$ ); however, there was no statistically significant relationship between the mean score of the care process with the participation in the training courses at the beginning of the mothers' integrated care plan ( $p=0.070$ ).

#### **4. Discussion**

The results of the study in evaluating and comparing the quality of the care structure showed that the preconception care structures were appropriate in most cases and that there were no differences between the preconception care structures in the centers; in other words, the necessary facilities and equipment for the preconception cares were the same in all of the centers. Despite the appropriateness of the quality of the care structure, there were some defects in the centers that were examined. The defects were associated with the lack of dentists, lack of laboratory technicians, lack of adequate maintenance of the health document files in the human resource section, lack of laboratory space, lack of required facilities (such as telephones), lack of appropriate waiting rooms, lack of adequate seating, lack of a water cooler, lack of toilets with hand-wash liquid in the equipment and administrative sections, lack of availability of dentistry services every day of the week, lack of notification about preconception services in the centers and lack of specification of the services that were provided.

Sohail Agha, who examined and compared the quality of family planning services in Kenya's public and private sectors in his study, reported that the quality of the care structure was just average (13). In this study, the structural problems that had led to a lower level of quality were associated with the personnel's having too little work experience and a lack of training in the field of family planning services. The quality also was diminished by the fact that trained personnel were not available for all working hours of the week, as well as the long time it took to get to the healthcare centers, and the lack of teaching aids. Simbar et al. also examined the equipment, including the necessary facilities, waiting room, obstetrics unit, and teaching facilities in the investigation of the care structure component. The results showed that the service providers had access to a minimum of the necessary facilities. Simbar reported that the major defects associated with the preconception care structure in Tehran were in the media facilities and in the failure to inform the clients (1). The results of evaluating and comparing the quality of preconception care showed that the level of quality of the care process in the health centers was just average and that only 5.2% of the women were offered the desired quality of care. Boller et al. also reported that the quality of antenatal care provided by the healthcare workers in Tanzania as poor (16). The results of the study by Simbar et al. also showed that, despite a relatively favorable offer of obstetrical checkups and paraclinic tests, the other provided care provided and the counseling provided were average or poor.

The results of comparing the centers in the process of providing care also showed that the same quality of preconception care was not provided; health center number 3 received higher scores for the process of providing care than the other health centers (Table 2). One reason for this was the quality of personnel's attitude concerning the necessity for preconception care. The results showed that the healthcare providers provided higher quality care when they agreed that there was a need to provide more preconception care. In health center number three, about 100% of the healthcare providers who worked in the center reported that the necessity of preconception care was high or very high. The results also showed that healthcare personnel who had worked more years in the mothers' integrated care provided higher quality preconception care. The results showed that about 80% of the personnel working in the centers covered by center number three had been working in mothers' unit since the mothers' integrated care project began. The results also showed 61.5% of healthcare providers who participated in the study had other responsibilities in the center in addition to their responsibility for providing preconception care. Among the personnel working in the centers covered by center number three, 75% also had other responsibilities, and only 25% of them worked fulltime in mothers' center. However, in these centers in which the healthcare providers had other responsibilities, the center had either two midwives in the mother's unit or the personnel from the family health unit also helped the midwives in the center in providing preconception care. An exact examination indicated that the average number women who were provided preconception care on a monthly basis in the centers was similar to that in the other centers. It seems that these centers were trying harder to increase the quality of the care they were providing.

The results of the evaluation and comparison of the outcomes related to preconception care showed that 95.1% of the women participating in this study were satisfied with the quality of the care they received. Simbar reported similar results in his study. The results of the comparison of the clients' satisfaction with the various centers showed

that there were no differences. The other related results to care outcomes showed that all of the women who participated in the study had the same level of knowledge (intermediate) about preconception care. Since examining the level of knowledge was one of the midterm results in the studies that addressed the quality of care based on the Donabedian model, the knowledge of the participants was examined, such as in Sharon's examination of the quality of antenatal care (14) and Simbar's examination of the quality of family planning services (15). In both studies, the subjects' knowledge of the study was evaluated.

The results related to the follow-up component concerning the outcomes of the quality of care, showed that the care that was provided by the healthcare providers at the centers was followed up poorly, with more than 65% of the women receiving no follow-up at all by the healthcare providers. Comparing the follow-up in the centers showed that the level of follow-up was not consistent among them (Table2). The follow up provided by the personnel of health center number five was the best among the centers. It seems that one of the reasons could have been the existence of active health liaisons in those centers, since each center had categorized its covered area and assigned one liaison for that area, and the liaisons had followed up as requested. Liaisons working in the centers are volunteer women who cooperate voluntarily in to protect the health of the women to encourage their neighbors to interact with the healthcare centers.

Concerning the administrative constraints of the study, we can say that the researcher had no control over some of the variables, such as individual and personality differences or the mental and psychological states of the subjects, which clearly could have influenced how they answered the questions. Another constraint was that it was possible that the subjects did not answer some of the questions truthfully concerning their level of satisfaction with the services. With regards to psychological problems or underlying diseases, the researcher considered the statements of research units to be accurate. In relation to observing the action of the care provider(s), despite what was done to put the subjects at ease when the researcher was present in the centers that were providing care, his presence was considered to be somewhat of a constraint in the present study.

## 5. Conclusions

The results of the study showed that the qualities of the preconception care process provided in the centers covered by Mashhad five health centers were different. In addition, there was a difference between the care that was provided in follow-up by the healthcare personnel, and this was a part of care outcome dimension and the working personnel in the covered centers by the health center number 5 provided higher quality follow up. The functional significance of these findings is that they can be used in areas of education, research, and management services. It is recommended that the quality of preconception care be evaluated from the perspectives of those being served. Further studies of the process of providing preconception care and of the healthcare personnel who work in the healthcare centers should be conducted in the future.

## Acknowledgments

The paper was derived from the research proposal coded 910087 for a Master's degree thesis in Midwifery, which was approved by Department of Health in the Mashhad University of Medical Sciences. Thus, we greatly appreciate and recognize the contributions of Mashhad University of Medical Sciences for funding this research, and we also express our appreciation to the respected authorities on the Nursing and Midwifery faculty at Mashhad and to the heads of the healthcare centers that participated.

## Conflict of Interest:

There is no conflict of interest to be declared.

## Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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