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Application of Donabedian Quality-of-Care Framework to Assess the Outcomes of Preconception Care in Urban Health Centers, Mashhad, Iran in 2012

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ABSTRACT

Background & aim: Health of mothers and children is one of the most critical public health issues around the world, and women's awareness of these problems will enable them to avoid unintended consequences. It is futile to plan for improving health care services without considering the patients' opinions. According to World Health Organization (WHO), Donabedian model is an appropriate framework for health care assessment, and pays particular attention to raising client's awareness, and satisfaction of the outcomes. This study was carried out in order to determine the quality of preconception care in health centers of Mashhad, in 2012.

Methods: This descriptive study was conducted on women in their reproductive age, who received preconception care in health centers of Mashhad. The demographic and obstetric data were collected by questionnaires of preconception care, which were designed based on the outcome aspect of Donabedian model. This model consisted of a questionnaire related to the knowledge of preconception care, and one on patient's satisfaction. Data were analyzed by SPSS version 16 using statistical tests of ANOVA, Chi-square and Pearson correlation coefficient.

Results: The mean age of the participants was 26.93±5.22, and average of 6.32±4.77 years had passed since their marriage; also 67.4% had experienced 1-6 pregnancies. The mean score of patient's satisfaction was 75.56±11.84, and that of preconception care knowledge was 14.8±4.53.

Conclusion: According to the results, it is recommended that more attention be paid to preconception health care in continuous medical education programs (CME). Moreover, better instructions should be provided for the clients to raise their awareness in this area.

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Introduction

Preconception health care as a missing link of prenatal care could improve pregnancy and birth outcomes (1). Thus, drastic changes were made in order to provide health care services for mothers and children, who were considered as high-risk and vulnerable groups. It was revealed that the efforts for improving weak pregnancy outcomes should start before conception (2- 5).

At present, preconception health care is found to be necessary, since it provides a valuable opportunity for medical intervention,

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as well as a chance for the diagnosis of risk factors, in order to prevent complications related to pregnancy and labor (5). If these medical interventions are not implemented before pregnancy, there will be no time and opportunity for eliminating or reducing some maternal complications; also, the risk of an unhealthy child and an uneventful pregnancy would decrease (6).

As to previous studies, most mothers became aware of their pregnancy after the critical period of organogenesis (7, 8); therefore in preconception period, mothers could resolve the problems which needed special care during their pregnancies (9). However, in comparison with developed countries, preconception health care is less welcomed in developing countries, and women refer to health care centers as soon as they are pregnant (10). The coverage of preconception care in developing countries is not comprehensive, and some studies conducted in Iran, reported it as 11% (11). This is due to the mothers' insufficient knowledge about the positive effects of preconception care, and lack of access to these services (12).

The quality of health care services is an important issue; I e, access to these services is not enough, and quality, as an indispensable element for improving maternal and neonatal outcomes, should not be neglected. The quality of preconception care has been considered as a growing concern in developing countries (13). Based on previous studies, around 90% of mortality rate can be prevented by the improvement of health care quality; this of course indicates the significance of care quality (14). A growing body of evidence indicates a considerable gap between maternal and neonatal mortality in developed and developing countries, due to the difference in health care quality (13).

Recently, World Health Organization (WHO) has released new preconception care programs with the purpose of decreasing the mortality rates of mothers and children. Health care improvement has been recognized as one of the best strategies for achieving this goal. Nowadays, providing high-quality health care services has been recognized as a priority in health care systems (15), and more attention has been paid to its type and role in saving human lives (16). The National Council of Health Care Quality believes that if a society aims to achieve a high quality of health care, it should prepare strategies for its evaluation and monitoring, and implement strict and effective interventions, in order to achieve the ideal and desirable quality (17). Thus , the common point of all theories is the special status of health care quality , and the necessity of its evaluation. The final goal of such evaluations is to improve the program outcomes and efficiency, better to say to enhance health care quality. In this regard, Crosby (1999) said, "Improvement is impossible without evaluation" (18).

Thus, the first step to change , and achieve the desired situation is the evaluation of the current situation; this is due to the fact that evaluation helps assess the present situation and determine the care quality , as well as detect the effectiveness of implemented interventions and the achievement level , and make necessary modifications in care programs (19). Several models have been proposed in order to assess health care quality, and among these, Donabedian model, as the most common evaluation framework, focuses on the outcome of the provided health care for the patients. In this model, the outcome is considered desirable only if it reflects the patient's preferences rather than the caregiver ' s (18-21).

The most comprehensive model used for health care evaluation is Donabedian model (22). It was presented in 1966, defining three distinct aspects of quality, which include structure, process and outcome (23). Due to its simplicity and flexibility, this model has been gradually accepted (24).

The effect of clinical and health care services on the health status of the patients is assessed in the outcome aspect (23, 25). In this model , outcome is the last element of health care quality; i.e., it is the desirable or undesirable changes in health care services, which are manifested in the effectiveness and quality of provided care (25- 28). The most important index of quality is outcome, since the primary aim of health care services and the health status of the patients are assessed and fed back in this part (26). In the outcome aspect, monitoring of the individual's health status, the level of knowledge, and satisfaction rate are focused on. Outcome means changes due to health care

services, which appear by improving the knowledge and health status of the patients, as well as their satisfaction with health care services. In other words, the effect of health care services on patient's health status and the reflection of provided health care on client's (patient's) health status is called outcome. It generally states the changes such as social and emotional changes, due to the provided health care in current and future health status of the patient (23, 25, 27). Therefore, if high-quality health care is provided, not only will the symptoms of patient's disease decrease, but the complications will be also delayed, and the client's (patient's) ability to cope with the complications will enhance; therefore it will lead to client's and family satisfaction (25).

Outcome evaluation is divided into two subcategories of intermediate (simultaneous), and final results (25, 29). The following factors are assessed in the intermediate results: patient's weight, blood pressure, sense of well-being, performance ability, knowledge development, satisfaction, and the ability to overcome the disease. However, it is important to evaluate the intermediate results with a special supervising system, because the results of long-term outcomes may be obtained after providing health care services, and the time would be wasted for altering health care policies and strategies; consequently, constant monitoring seems to be crucial (23, 30).

Several studies have been conducted based on Donabedian model; for instance, Indian (31) and Zambian studies (32) have compared the quality of prenatal care in different parts of these countries, based on this model. Considering the structure and process aspects, both studies reported that the quality of prenatal care is less than the desirable level. Boller (2008) and Naariyong (2011) have also applied Donabedian model in their studies of structure and process of prenatal care (33, 34). Zaky (2007) studied Egyptian women's opinions regarding the quality of reproductive care, based on this model (34). Simbar (2011) also studied health care quality, before delivery, in terms of structure, process and outcome. He reported the desirable quality of structure and the undesirable quality of health care, regarding the process aspect (22).

Agha (36) compared the quality of family planning services in his study, in Kenya. He reported that in private sections, quality of health care is more desirable in comparison with the governmental sections, in terms of structure, patient's satisfaction, and interpersonal interaction. Despite the importance of preconception care, and its 10-year implementtation in Iran (37), limited studies have been conducted in this field. No Iranian Research can be found, based on Donabedian model, for preconception care. Therefore the present study aimed to answer the questions regarding the patients' satisfaction level, and their knowledge level of preconception health care.

Materials and Methods

After considering the ethical standards, a pilot study was conducted on 30 women in their reproductive age. The pilot was carried out in order to estimate the sample size. The population was calculated as 350, which was the sample size of the knowledge index in the outcome aspect of Donabedian model (CI=95%, α=0.05).

Multi-stage non-probability sampling method was used; five health care centers in Mashhad were listed, and 22 of them were randomly selected as the setting for the study.

The subjects, having met the inclusion criteria, were selected from the patients of Mashhad health centers, referring for preconception care; they were chosen by convenience accessible sampling.

The inclusion criteria were as follows: being an Iranian; residing in Mashhad, with reading and writing literacy; being fluent in Farsi language; being physically and mentally healthy; referring to health care centers for receiving preconception care.

The patients who met the following criteria were excluded from the study: being a health care provider; suffering from infertility; having pregnancy and psychiatric disorders, or taking psychiatric medications, either in the past or present.

The study instruments were two questionnaires regarding the patient's satisfaction and knowledge level. The satisfaction questionnaire included 28 questions rated by 5-point Likert scale, with the 'strongly agree' -'strongly disagree' continuum. This questionnaire was scored

from 0 to 112 and data obtained from the questionnaire were compared with the desirable status, based on the following classification: 0-25% as' strongly dissatisfied' or 'dissatisfied' , 26-50% as having 'no idea', 51-75% as 'satisfied' and 76-100 % as 'strongly satisfied'. The Knowledge questionnaire consisted of 30 questions, in 8 sections on periodontal health, sexual health, drug supplements, pregnancy symptoms according to the Ministry of Health and Medical Education, and instructions on the right time of pregnancy and discontinuing family planning method. In order to design this questionnaire, different reference books of maternal and neonatal health care nursing were reviewed (42-49). This questionnaire was scored from 0 to 30 and data were compared with the desirable status in three levels: 0-33% as 'poor knowledge', 34-66% as 'average knowledge' and 67-100% as 'excellent knowledge'.

After following the ethical considerations, and obtaining informed consents from the participants, demographic and obstetric data were collected via interviews. Afterwards, the participants were asked to complete the knowledge and satisfaction questionnaires after receiving preconception care. The Knowledge questionnaire was about preconception health care and pregnancy symptoms, while the Satisfaction questionnaire was about the patient's satisfaction with the provided preconception care. Content validity was used for confirming the validity of applied instruments by reviewing the comments of 10 faculty members. The reliability of demographic data was confirmed based on previous studies; however, the reliability of satisfaction and knowledge questionnaires were confirmed by Cronbach's alpha (α=0.89, α=70). Data were analyzed by SPSS version 16 using Pearson correlation coefficient, Chi-square and ANOVA tests.

Results

Three hundred and fifty women in their reproductive age participated in this study. Their mean age was 26.93±5.22 and average of 6.32±4.77 years had passed since their marriage. Most of them (90.9%) were housewives. Of the 350 women who enrolled u, 64.5% were under insurance coverage, and 67.4 % of them had a history of pregnancy (range: 1-6 pregnancies). Among women with a previous history of pregnancy, 62.1% had the experience of delivery between 1-4 times. In our study, the mean score of total satisfaction was 75.56±11.84, and the mean of knowledge score related to preconception health care was 14.8±4.53. In our study, out of 350 women, around 95.1% were satisfied or strongly satisfied with preconception care (Figure 1).

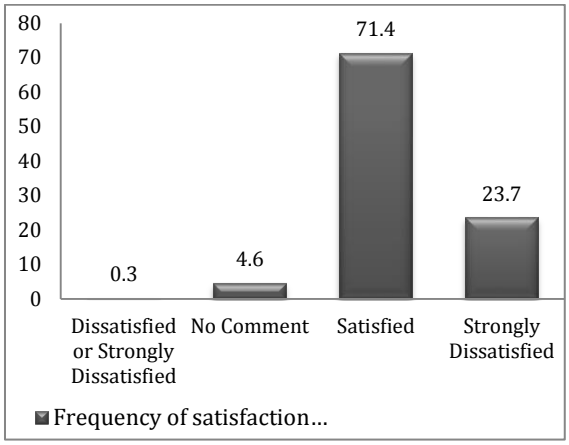

Figure 1. Frequency distribution of satisfaction level of preconception care outcomes in Mashhad health care centers

As to the instructions of health care providers, the minimum score of satisfaction was obtained. The satisfaction aspects have been shown in Table 1.

Table 1. The mean score of satisfaction of preconception care outcomes in Mashhad health care centers

variable	Mean±SD	Min	Max
Satisfied with structure	16.76±3.10	6	24
Satisfied with counseling and care	18.26 ±3.02	6	24
Satisfied with instructions	14.66 ±4.03	0	24
Satisfied with physician	25.87 ±5.34	6	40

The results showed that in terms of satisfaction with structure, 0.4% of women were dissatisfied or strongly dissatisfied, 5% had no idea, 72.4% were satisfied and 22.7% were strongly satisfied.

Regarding the consultation and care provision by health care providers, 0.3% was

dissatisfied or strongly dissatisfied, 3.1% had no idea, 54.9% were satisfied, and 41.7% were strongly satisfied.

In relation to the patient's satisfaction with instructions, results indicated that 3.4% were dissatisfied or strongly dissatisfied, 23.7% had no idea, 55.7% were satisfied and 17.1% were strongly satisfied. In terms of satisfaction with physicians, 1.1% was dissatisfied or strongly dissatisfied, 14% had no idea, 66% were satisfied and 18.9% were strongly satisfied.

There was a significant association between the mean score of participants satisfaction with her husband's occupation (p<0.039), and history of pregnancy (p<0.039), child delivery (p<0.027) and parity (p<0.035). The minimum score of satisfaction with the structure was that of the waiting time for receiving health care services (19.7%). Considering the health care provision and consultation with health care providers and physicians, the minimum score was obtained in relation to the time duration of patient's inquiry about their own health status (36% and 13.1%, regarding the physicians and health care providers, respectively). Most women had an average knowledge (68%) of preconception health care (Figure 2).

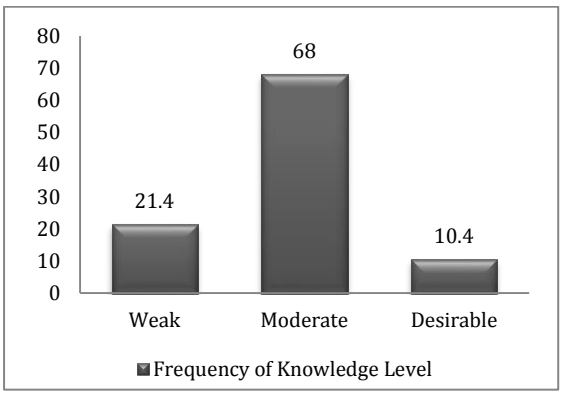

Figure 2. Frequency distribution of awareness level of preconception care outcomes in Mashhad health care centers

The assessment results related to the knowledge of preconception health care are demonstrated in Table 2. The minimum knowledge score was that of cessation of contraception and the exact time of conception.

There was a significant difference between demographic and obstetric data of participants regarding their age (p<0.001), marriage duration (p<0.002), level of education (p<0.00), husbands' level of education (p< 0.045), history of pregnancy (p<0.005), history of delivery (p<0.024) and history of receiving preconception care (p<0.012), based on independent t-test, Pearson coefficient, and ANOVA.

Table 2. The mean score of knowledge of preconception care in Mashhad health care centers

variable	Mean±SD	Min	Max
Personal hygiene	52.36±19.93	0	85.71
Mental health	42.28±28.81	0	100
Sexual health	50.95±30.34	0	100
Oral health	53.14±26.84	0	200
Nutrition	29.65±22.79	0	100
Supplement consumption	49.52±33.92	0	100
Timely conception and cessation of contraception	25.57±32.71	0	100
Information about pregnancy	49.82±24.25	0	100

Discussion

In this study, the outcome of provided preconception care in the selected health care centers of Mashhad has been assessed, based on Donabedian model. Preconception care is considered as part of the prenatal care; in fact, during this time, mothers receive medical services and psychosocial support in an organized approach. Ideally, it should start before conception and continue through the prenatal period (11). The outcome of preconception care based on Donabedian model includes two categories of patient's satisfaction and the knowledge of preconception care.

The most important index of health care quality is client's satisfaction with the health care services; undoubtedly, it reflects the ability and capability of the physician and health care providers (38). It also reports the health care quality and mirrors the mutual interaction between care givers and care provides (35). Preconception care, regarded as a part of health care programs, assesses women's health status, life style and history of preconception care, and can be helpful in recognizing the risk factors related to pregnancy; therefore it can prevent further complications. It is expected that preconception care, even at its lowest level, be provided in health care programs for women, in order to resolve their preconception problems,

and lower the load of undesirable outcomes (40). However, in the present study, it was demonstrated that 89.4% had poor to average level of knowledge related to preconception care. As to the findings, the knowledge level of preconception care was poor in some cases and desirable in some others. Only one third of the participants had sufficient knowledge regarding the psychological preparedness before child birth; for instance, most of them believed that the birth of the neonate could resolve their marital problems, and treat their depression.

In terms of periodontal health care, most participants knew that the best period for dental examination is in the preconception period; however, some of them were not aware of the fact that poor dental care increases the risk of premature delivery. Based on our findings, half of the participants were informed about the benefits of taking iron supplements before pregnancy. In terms of folic acid, half of them knew that they should start folic acid 3 month before pregnancy.

In relation to their nutrition, most participants did not know that bread and cereals are the best sources of energy during pregnancy, and two thirds of them did not recognize that they could substitute meat with other alternatives. In terms of information about pregnancy symptoms and the right time of pregnancy, most of them were unaware of pregnancy symptoms; they also were negligent to the fact that they should be visited after their last menstrual period.

However, the participants had sufficient knowledge in some regards, such as the advantages of sports (68.3%), and the activities they had to avoid in case they had doubts about their pregnancy (69.1%). In general the level of knowledge was not desirable, except for personal hygiene. Studies which concentrated on health care quality, based on Donabedian model, mostly evaluated the client's knowledge, since it was one of the intermediate outcome results. For instance, Sharon has assessed the knowledge level in a study on the quality of preconception care, and Simbar (2006) has also observed the knowledge level, and the quality of family planning programs. Naariyong *et al.* (2011) reported that Ghanaian women have sufficient knowledge, regarding pregnancy care, and the warning signs and symptoms of pregnancy (34). The higher level of knowledge could be justified due to the extensive coverage of these care programs for pregnant women. In the present study, 97% of women said they were monitored by either private sections or governmental centers during their pregnancy.

Since preconception care is a new emerging field, its coverage is not comprehensive; based on two distinct studies, the reported coverage of preconception care is 11% and 17% (11). Consequently, it is high time that health care centers took responsibility to inform the community about the importance and advantages of preconception care. Simbar *et al.* (2006) studied the quality of family planning services of Tehran health care centers and showed that the mean knowledge level of these services is around 54%. This could be interpreted as the average level of knowledge, and indicates poor instruction of family planning methods. It seems that insufficient knowledge is the most important cause of failure in family planning, and consequently, unwanted pregnancy in Iran; however this issue could be resolved by high quality consultation and instructions (39).

Two important factors noted in the aforementioned studies are: examining the clients on the instructed materials, and applying educational media which is recommended in health care programs. Based on the results, the highest knowledge level was allocated to women with high parity, who had academic education, and long marriage duration. The possible reason could be their extended experience of marriage, higher number of pregnancy and delivery, and their experience of pregnancy complications. Normally, more experience in this field leads to the increased level of knowledge about preconception care, since these women seek more information in this regard.

There was a significant relationship between the knowledge score and the patient's age, length of marriage, and education level. It is evident that the longer duration of marriage leads to seeking more knowledge, and helps avoid an uneventful pregnancy. The higher education level of women and their husbands can encourage knowledge acquisition; this is due to the fact that education level makes individuals more knowledgeable regarding the

risky conditions of pregnancy, and therefore motivates them to seek knowledge via different sources.

Satisfaction of the clients is a valuable criterion for assessing the performance of health care planners and authorities; therefore it can help with the promotion of health care provision (38).

Regarding the literature, more than 90 % of maternal mortality rate could be prevented by improving health care quality. Therefore, it is necessary to improve health care quality in pre- and post-partum periods, in order to monitor the patient, and have an early diagnosis of pregnancy risks and complications, in all levels of service delivery (22). Nowadays, patient's satisfaction is considered a valuable index for evaluating the policy makers' and administerators' performance, and it can facilitate planning strategies for health care promotion (35).

Based on the findings, most women were satisfied or strongly satisfied with the provided preconception care. Simbar *et al.* (2006) also reported 70% satisfaction rate of family planning services (39). The highest dissatisfaction frequency in both studies was related to the instructions. Even though health care provision without instruction is inadequate, the gathered data indicated either receiving no instruction or insufficient instructions in this field. The results of both Simbar (2010) and the present study showed that minimum satisfaction was related to waiting time (the structure of health care services) and lack of time for asking questions from the health care providers and physicians (6).

The study by Zaky *et al.* (2007) showed similar results due to the long waiting time for receiving health care services. Sharemi *et al.* (2007) studied clients' satisfaction with antenatal care units in health care centers of Rasht, Iran. They concentrated on the interaction between care givers and providers (the process aspect), their technical performance, and the patient's satisfaction with structure (physical environment, organization, waiting time, access to the equipments, welfare facilities and expenses). They reported an acceptable level of satisfaction in most cases. Maximum client's satisfaction was related to the professional qualities of health care providers, and the minimum satisfaction was with that of the facilities and physical environment of health care centers.

One of the most crucial aspects in this regard is the physical environment which is an essential factor leading to patient's satisfaction. Handler said "Women are very sensitive to the physical environment and the sanitation of waiting examination rooms; they may be less inclined to use untidy health care services". In general, more consultation with the mother and providing the necessary instructions brings higher levels of satisfaction (38). Oladapo *et al.* (2008) reported the satisfaction rate as 81.4%, for preconception care in Nigeria. Maximum dissatisfaction was related to the equipments and facilities (health care structure) of health care centers and lack of their participation in decision making. In Oladapo' s study, receiving health care services from different providers (due to the changing shifts), and the structure of health care centers led to the patients' dissatisfaction; since they received various care services, with different qualities, during their pregnancy (13).

Based on the present study, higher satisfaction levels could be achieved by improving the instructions, and applying communication skills in interactions. According to the mentioned studies, various researchers stated some effective factors related to patient's satisfaction, based on their own knowledge, experience or model. However, all of them can be summarized in Donabedian model, with three aspects of structure, process and outcome, and the model can explain the reasons for patient's dissatisfaction. For instance, study by Simbar related most problems of dissatisfaction to structure and process; also, studies by Oladapo, and Sharemi *et al.* were revealed structural problems (the equipments and personnel). Mirmolaye (2005) also reported similar reasons for patient's dissatisfaction, though with a different classification (41).

The present study showed that maximum level of satisfaction can be achieved regarding the structure and process aspects. In other words, as to the structure, the improvement of health care organization and the staff can lead to patient's satisfaction. Concerning the process aspect, the effective interaction between care

provider and care giver, as well as delivering proper care for the patient, could be conducive to maximum satisfaction rates.

There was a significant relationship between the client's satisfaction score and parity, history of pregnancy and delivery, and the husband's occupation. In terms of the association between the patient's satisfaction and her husband's occupation, results indicated that those women, whose husbands were employers or businessman were more satisfied with the provided care, in comparison with those whose husbands were workers or had other occupations. This might be due to health care expenses, which could be more easily paid by people with higher income; therefore, people with lower income, were reported to have lower levels of satisfaction. On the other hand, an inverse relationship was found between the mother's parity and her satisfaction rate; it was reported that women with high parity are less satisfied, compared with others.

Limitations of the present study included uncontrolled factors such as the subject's personality, cultural models, the effects of social class on behavior, and level of expectation which can influence the answers to satisfaction questionnaires. Other limitations were related to the focus of client's answers on the history of medical or psychiatric conditions. Also most participants used the natural withdrawal method, and the use of other methods was quite limited; this method is considered to be risky, so the patients need to be treated by health care providers, and be referred to health care services; this was another limitation of the study.

Conclusion

Due to the importance of preconception care, more attention needs to be paid to the improvement of both quality and quantity (the number of referred patients) of health care services. This will increase the public knowledge about health care services, and therefore women can recognize the related risk factors, and experience pregnancies with higher preparation. On the other hand, based on the present study, higher levels of satisfaction can be achieved by concentrating on the role of instruction, and improving the maternal and family health status.

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