Original Research Article

Evaluating the Structure of Prenatal Care Using the Donabedian Model: A Study at Health Centers in Gorgan, Iran

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ABSTRACT

Introduction: Healthcare centers aim to improve the quality of managed care using a diverse range of organizational strategies and through management of patients' health and behavior. The goal of prenatal care is to ensure the health of future mothers during the prenatal and postnatal periods. The purpose of this study was to evaluate the structure of prenatal care in health centers of Gorgan (Iran) based on the Donabedian model. **Materials and methods:** This descriptive-analytical study was carried out in 18 of 22 health centers in Gorgan (Iran) that were selected via multistage probability sampling. Data were collected using a 60-item questionnaire based on the Donabedian model with 5 dimensions (physical infrastructure, waiting room equipment, midwifery unit equipment, human resource infrastructure and access to services). Another questionnaire consisting of 14 questions was used to collect biographic information. Data were analyzed with SPSS (version 16). Normal distribution of variables was assessed using the Kolmogorov-Smirnov test. Parametric tests (binomial) and nonparametric coefficient were used for assessment of normal and non-normal data, respectively. All statistical analyses were performed at 95% confidence level (P <0.05). The Friedman test was used for one-way repeated measures analysis of variance by ranks. **Results:** The average total score of structure was 30.83 in the health centers. The average score for waiting room equipment, midwifery unit equipment, human resource infrastructure, physical infrastructure and access to services was 4.61, 13.94, 1.78, 6.56 and 3.94, respectively. Based on the average structure scores and prioritization, the rankings were as follows: physical infrastructure, midwifery unit equipment, waiting room equipment, access to services and human resource infrastructure. **Conclusions:** Generally, the low score of quality of services in the present study indicates the need for planning and paying proper attention to non-therapeutic aspects of health services and improvement of services quality.

KEYWORDS: Managed care, Pregnancy, Structure, Donabedian model

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INTRODUCTION

Providing health care is a costly, complex and global phenomenon comprising of services that significantly affect the economy and quality of life of individuals [1]. As one of the most valuable and cost-effective primary health care programs, services offered during pregnancy reduce maternal and neonatal mortality, promote the health of mothers and infants, and reduce the burden on the healthcare system [2]. Quality of care means that access to care alone is not enough and the quality of these services should be considered as an essential component in the improvement of maternal and neonatal outcomes [3]. Quality of services in healthcare and medical centers can be used as a strategic tool for success in competitive situations [4]. Mothers' health is one of the main cornerstones of maternal and child health care, which is assessed by indicators such as the maternal mortality ratio [5]. The maternal mortality ratio is a developmental indicator of a country, which is strongly influenced by the quality of care [6]. Reducing maternal mortality not only reflects social justice, but also indicates the promotion of health of mothers and the future generation [7]. One of the goals of prenatal care is to reduce maternal and neonatal mortality. In the last 40 years, the maternal mortality rate has fallen from 83.3 to 8.6 per 100,000 live births [8]. It is essential to identify factors affecting the quality of the delivery of these services. Quality of service has been also linked to maternal death in Iran [9]. Currently, the quality of prenatal care is

considered a main health concern in developing countries [10]. The most commonly used model fpr assessment of quality of health care is the Donabedian model, which was designed in 1966 with three dimensions of structure, process and outcomes [11]. Based on this model, quality assessment criteria are not limited to the outcomes of the patient care process, but considering the systemic viewpoint, these criteria are present in all three aspects of a healthcare system including inputs, the process of conversion and output [5]. In terms of structure, the environment and equipment required for delivery of services is evaluated. In the dimension of process, the process of delivering services is evaluated, while in the dimension of outcomes, the effects of services and care on the health status of the patients are examined [11]. The requisite of evaluating quality of service is to provide a definition for a desirable condition or development of standards for continuous evaluation and improvement of quality, meaning that high quality service requires full equipment, highly-skilled staff and sufficient time [11]. Poor performance of health care providers also negatively affects the outcomes of the services delivered and is accompanied with people's dissatisfaction, while improving the quality of care is not possible without taking into account the patients' comments and expectations. In addition, assessment of patient satisfaction in each aspect of care helps clarify the shortcomings and appropriate solutions [12]. Studies in different parts of India [13] and Kenya [14] have shown that the quality of prenatal care is not favorable in terms of structure and process of care based on the Donabedian model. Naariyong et al. have also utilized this model to evaluate the structure and process of prenatal care [15]. Providing quality care relies on presence of a suitable and standard structure. Assessment of quality and the process of providing care can reveal the impact of measures taken to promote the quality of care. The aim of this study was to investigate the structure of prenatal care centers in Gorgan (Iran) based on the Donabedian model.

MATERIALS AND METHODS

This cross-sectional and descriptive-analytical study was carried out in the first half of 2016 in Gorgan, Iran. The study received approval from the ethics committee of the Islamic Azad University of Sari, Iran. Overall, 18 health centers (10 urban and 8 rural) were enrolled via multistage probability sampling. Two midwives and two healthcare workers from each center were selected (one health center had only one midwife). All staff of the health centers who were mandated to take care of pregnant women completed a questionnaire consisting of 14 questions on demographic information. A checklist comprising of five sections and 60 questions on the dimension of structure was designed based on the Donabedian model. The dimensions were as follows: physical infrastructure (8 items), waiting room equipment (10 items), midwifery unit equipment (27 items), human resource infrastructure (6 items) and access to services (9 items). The checklist was first used by Ghaffari et al. in 2014 to study structure quality based on the Donabedian model in prenatal care centers of Mashhad, Iran [3]. Reliability of the checklist was confirmed with Cronbach's alpha of 0.85 [3]. The structure checklist was completed by the researcher while visiting each center and the biographical questionnaire was completed by the staff. Each question had two answers; "yes" and "no", which were given score of 1 and 0, respectively. Scores higher than the half of the total score in each section indicated satisfactory structure, while scores equal or less than the half of the total score indicated moderate structure.

Data were analyzed with SPSS (version 16). Normal distribution of variables was assessed using the Kolmogorov-Smirnov test. Parametric tests (binomial) and nonparametric coefficient were used for assessment of normal and non-normal data, respectively. All statistical analyses were performed at 95% confidence level (P <0.05).

The Friedman test was used for one-way repeated measures analysis of variance by ranks.

RESULTS

The results showed that 97.1% of the staff participated in retraining and 77.1% had sufficient time to provide care. In addition, 54.3% of the staff had communication skills (Table 1). It is noteworthy to mention that all midwives were women.

Table 1. Frequency distribution and demographic characteristics of health centers staff in Gorgan, Iran

Demographic variable	Category	Number (%)
Education level	Bachelor's degree	18 (54.1)
	High school diploma	17 (48.6)
Marital status	Single	7 (20)
	Married	28 (80)
History of pregnancy	Yes	31 (88.6)
	No	4 (11.4)
Employment Status	Official	31 (88.6)
	Contractor	4 (11.4)
Other responsibilities	Yes	34 (97.1)
	No	1 (2.9)
Communication skills training	Yes	19 (54.3)
	No	16 (45.3)
Interest in the job	Yes	22 (62.8)
	No	13 (37.2)
Sufficient time to provide care	Yes	27 (77.1)
	No	8 (22.9)
Participation in retraining	Yes	34 (97.1)
	No	1 (2.9)
Maternal and child health integrated booklet	Yes	35 (100)
	No	0

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The average total score of structure was 30.83 in the health centers. The average score for waiting room equipment, midwifery unit equipment, human resource infrastructure, physical infrastructure and access to services was 4.61, 13.94, 1.78, 6.56 and 3.94, respectively. Based on the average structure scores and prioritization, the rankings were as follows: physical infrastructure, midwifery unit equipment, waiting room equipment, access to services and human resource infrastructure (Tables 2-4).

Table 2. Descriptive characteristics of structural variables

Variables	Average score	Standard deviation	Minimum	Maximum
Structure	30.83	3.47	25	37
Physical infrastructure	6.56	0.70	5	8
Waiting room equipment	4.61	1.20	3	7
Midwifery unit equipment	13.94	1.59	11	16
Human resource infrastructure	1.78	0.94	0	3
Access to services	3.94	0.94	3	5

Table 3. Analysis of structure based on binomial test

Variables	*Quality of service	Number (%)	P-Value
Structure (maximum score: 50)	≤25	1(6)	0.00009
	>25	17(94)	
Physical infrastructure of the health center (maximum score: 8)	≤4	0(0)	0.00009
	>4	18(100)	
Waiting room equipment (maximum score: 10)	≤5	13(72)	0.033
	>5	5(28)	
Midwifery unit equipment (maximum score: 27)	≤13.5	7(39)	0.481
	>13.5	11(61)	
Human resource infrastructure (maximum score: 6)	≤3	18(100)	0.00009
	>3	0(0)	
Access to services (maximum score: 9)	≤4.5	11(61)	0.481
	>4.5	7(39)	

* Moderate: ≤ 50% of maximum score; Satisfactory: > 50% of maximum score

Table 4. Ranking of structure dimensions

Variable	Average rank	Priority
Physical infrastructure of the health center	5.00	First
Waiting room equipment	2.83	Third
Midwifery unit equipment	3.33	Second
Human resource infrastructure	1.47	Fifth

DISCUSSION

The overall quality of structure of the health centers of Gorgan is higher than the average. The health centers scored below average in terms of the physical infrastructure, waiting room equipment and human resource infrastructure. However, the results showed that the quality of midwifery unit equipment and access to services was roughly average. In this regard, the highest and lowest rank was related to the physical infrastructure and human resource infrastructure, respectively. According to Agha and Do, structure of prenatal care services in the health centers of Kenya has moderate quality [14]. Inconsistent with our findings, Simber et al. reported that centers affiliated to the Shahid Beheshti University of Medical Sciences have satisfactory quality of prenatal care services in terms of structure, equipment and physical environment. However, the mentioned study has not investigated the structure of human resources and organization of forces. This study also claimed that the healthcare providers had access to the minimum essential facilities [10].

A similar study on the quality of prenatal care indicated that the structure of health centers in Zambia was undesirable, in a way that only 3% of the centers had a desirable level of the structure of care. In terms of quality, the lack of access to skilled human resources and the lack of equipment necessary to perform the services were the main reasons for the undesirable quality of structure in these centers [16]. These findings are not consistent with our results. Hakari et al. [9] and Ghaffari Darabi et al. [5] revealed that the quality of structure was favorable in 27.78% and moderate in 72.22% of health centers, which is not in line with our results. Further comparison of our study with previous studies was not possible since the structural dimensions were not evaluated in most previous studies.

One of the most important indicators of quality of service delivery and monitoring of health services is client satisfaction. High rate of midwifery clients, pregnant women as well as postpartum and prenatal care clients in centers with midwife shortage creates long queues and decrease the quality of care offered by the healthcare providers. Shortcoming of healthcare equipment and facilities such as the lack of laboratory, telephone, appropriate waiting space, enough seats for clients, water cooler and toilet sink with hand wash liquid will reduce the quality of the structure in health centers.

CONCLUSION

Generally, the low score of quality of services in the present study indicates the need for planning and paying proper attention to non-therapeutic aspe cts of health services and improvement of services quality.

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