

# The impact of applying 5S management method on patient satisfaction in healthcare centers' services

Shadab Shahali (✉ [shadabshahali@yahoo.com](mailto:shadabshahali@yahoo.com))

Tarbiat Modares University Faculty of Medical Sciences <https://orcid.org/0000-0003-0421-9504>

Massomeh Khajehasani

Ahvaz Jondishapour University of Medical Sciences Faculty of Nursing and Midwifery

Amin Torabipoor

Ahvaz Jondishapour University of Medical Sciences Faculty of Public Health

Kambiz AhmadiAngali

Ahvaz Jondishapour University of Medical Sciences Faculty of Public Health

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## Research article

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# Abstract

**Background:** Improving service quality and increasing clients' satisfaction is the most important aim of the health centers. This study aimed to investigate the effect of implementing the 5S management approach on the service quality provided at community health centers. **Methods:** This is a quasi-experimental study done with the participation of 220 pregnant women at a health center in Ahvaz in 2018. The quality gap and weaknesses were measured before 5S implementation by using adornment system (5S) checklist and SERVQUAL questionnaire. Interventions were designed and implemented with regard to the system weaknesses and the next evaluation was carried out 2 months after intervention. **Results:** Based on the findings of this study, the 5S score was 2.4 before the 5S implementation and 4.2 after the intervention. The mean scores of health service quality provided in community health centers significantly differed before and after the 5S implementation ( $P < 0.0001$ ). **Conclusions:** Implementation of 5S can improve the work environment adornment and the satisfaction of health centers' patients. Therefore, it is advised to use techniques to increase the quality of health centers' services.

## Background

High quality health care is the level of health services provided to individuals and communities that improve the probability of health care results [1]. Patients' satisfaction is a necessary condition for quality definition [2]. Considering the importance of patient satisfaction of services in the effectiveness and quality of the provided services, the patients' satisfaction index plays an important role in increasing the efficiency of the organization's performance [3-4]. Quality of service is in fact a kind of patients' judgment, based on their perceptions of the service receiving process [5] and if the expectations are more than the perceptions, the service quality that is received by the patient is low in his opinion and leads to dissatisfaction [6]. In today's changing world, many organizations are looking for ways to achieve competitive advantage and differentiate their products and services from other organizations. One of the available strategies to meet this, is to raise the quality of services and products and promote productivity. This brings about the need for managerial and scientific tools and techniques. One of the strategies to improve the quality of services is the 5S (Seiri, Seiton, Seisou, Seiketsu, Shitsuke) management model and other related techniques. Today, 5S is a key management tool [7]. 5S which was originally developed by Hiroyuki Hirano, stands for the five Japanese words Seiri, Seiton, Seiso, Seiketsu, and Shitsuke which are often translated into English as "sort, set in order, shine, standardize, and sustain". These bases include Seiri (to separate necessary tools, equipment and materials from unnecessary materials and remove them in the next stages), Seiton (to arrange and identify parts and tools for easy use), Seisou (careful cleaning of each part), Seiketsu (standardization to manage the previous three steps repeatedly and maintaining the work environment under available conditions) and Shitsuke (continuing to shape habits to follow the first four S) [8, 9]. Daiani (2008) and Tafreshi (2012) have demonstrated that the adornment system implementation, with regard to its simplicity and the useful and beneficial results, is necessary for any applicable small and large scale organization, and the management approach of 5S

decreases the waste by improving the work environment and visual management organization [10, 11]. Nouri (2014) and Karami Matin (2012) stated that this strategy would create and maintain a work environment in a suitable, clean and effective organization [12, 13]. The major aim of implementing 5S in organizations is to provide the best possible care to the patient with the most effective method [14]. Of course, the role of each country and culture of the organization is undeniable in view of providing more dynamicity and a more capable field for implementation of management designs. Furthermore, senior managers' belief in the ability of this system to improve performance and increase productivity is a sure guarantee for the organization's success [15]. Studies have shown that paying attention to features and interventions in the workplace to improve the work environment of service providers is effective in promoting care of patients [13, 15-16]. However, in Iran, there are few studies on the benefits of using this technique in health centers and hospitals [12, 13], and there is no study to examine the effect of this method on the satisfaction of patients with the service quality. With regard to the categorization of community-based health centers as a place for providing primary preventive services, process and equipment complications and availability of a vast domain of guidelines, instructions and forms, and the lack of proper physical space, lack of fast access to documents, evidence and records and the possibility of increasing costs for reasons such as rework and the need for quality promotion in the health sector in terms of service type, as well as the lack of efficient attention paid to the implementation of 5S in these centers and the lack of many studies in this field, this research aimed at studying the effect of implementation of 5S management method on satisfaction of patients at a community health center west of Ahvaz city in 2018.

## Methods

This is a quasi-experimental study that was carried out with the participation of 220 pregnant women in Ahvaz No. 4 community Health Center in 2018. In the Iranian health system, the community health centers are first level health centers which have vaccination facilities, mental health care, family health care, nutritional care and doctor units. Services at these centers are free. Most of the centers' patients are pregnant women.

Sampling was done using convenience sampling method. All pregnant women over the age of 18 who were under the support of this center and did not have any history of mental diseases and received care at least twice at the health care center, were enrolled in the study. The data collecting tool was a 5S audit checklist which was used to determine the present status of selected units, before and after the research in terms of adornment [17-18]. It should be noted that the acceptable audit score based on the 5S audit checklist in health care organizations is and the checklist was completed by the researcher. Data were collected with the use of two kinds of questionnaires; demographic questionnaire and SERVQUAL that were completed by participants before and 2 months after the interventions implementation. The validity and reliability of the SERVQUAL questionnaire were studied in the study of Heidarnia et al. Cronbach's alpha coefficients were higher than the recommended level of 7 which shows that the tool was valid [4]. SERVQUAL examines five dimensions of service quality (Reliability, Responsiveness, Assurance, Empathy, and Tangible) with 22 questions. To determine the quality gap, the score which the patients gave to the

existing status of the health service quality (their perception of the provided service quality) was compared with their score on their desired status of health service quality (their expectation of service quality). The resultant score, if positive, showed that the provided services are more than the customer's expectations, and if negative, it showed that the provided services don't meet the patients' expectations and the quality gap is negative. If the resultant score was equal to zero, it showed a lack of quality gap and indicated that the health care service provided to the patients is what they expected. Before the intervention, the SERVQUAL questionnaire (to assess the clients' satisfaction before the 5S implementation) was completed by the participants. The training sessions of 5S management system were held in four 1-hour sessions in the morning at the health center's principle room attended by colleagues involved in the 5S implementation process. The aim of the research plan, the necessity of this design implementation and the benefits of the project were expressed in the session. Then, in a 8-hour workshop, the principles and step by step method of implementing the 5S work environment organization technique, the concepts and the way of implementing 5S in community health centers were taught to personnel employed at center No 4 west of Ahvaz. The 5S implementation instruction manual was also provided to the participants. One month after the workshop, the 5S audit checklist was again completed by the researcher. SPSS.21 software was used for data analysis and for statistical operations. To provide descriptive statistics, distribution of central indicators and dispersion, frequency, percentage, mean, standard deviation were used. To compare the mean and to find the effect of 5S implementation on the patient satisfaction of community health center No. 4 west of Ahvaz city, paired t-test was used before and after the intervention.

The study had an ethical code IR.AJUMS.REC.1395.801 from Ahvaz Jundishapur University of Medical Sciences. After introducing the study to participants, written consent had been obtained from all of them and they had been informed about anonymity and confidentiality during data processing and their right to withdraw from this study at any time.

## Results

The number of pregnant women who participated in the study was 220, but 5 due to lack of desire to participate in the study, 6 due to the need to travel, 4 due to their infants' hospitalization, 3 due to immigration, and 2 due to mothers' hospitalization were excluded from the study. The mean age of the participants was  $29.7 \pm 6.2$ , 20% (44 people) didn't have a diploma degree, 30.9% (68 people) had diplomas, 10.5% (23 persons) had undergraduate degrees, 33.6% (74 persons) had a bachelor's degree, and 11 people (5%) had master's degrees and over 83.3% were housewives and 28% were employees. 28.6% had come for prenatal care, 39.1% had received nutrition counseling and were under a doctor's care beside prenatal care, and 29.1% received prenatal care and were under a doctor's care. The mean score of the selected units' workplace adornment before the implementation of 5S was 2.4 and the audit score of these units after the implementation of 5S was 4.2 score. According to the findings, the performance of the 5S adornment system was seriously effective in all three units and increased the audit score. Given the acceptable score of the 5S audit based on the checklist, the status of the health center is favorable after the implementation of 5S.

The mean (SD) scores of expectations, perceptions and quality gap of health services provided in community health centers before and after 5S implementation are shown in Table 1.

**Table 1.** Mean (SD) scores of patient's perceptions, expectations and quality gap by different dimensions from patients' point of view

T-test (P value)	Gap (after)  (Expectations – Perceptions)	Score  Perceptions (after)  M (SD)	Expectations (after)  M (SD)	Gap (before)  (Expectations – Perceptions)	Score  Perceptions (before)  M (SD)	Expectations (before)  M (SD)	Dimension
<b>P&lt; 0.001</b>	-3.5	15.96 (2.1)	19.49(0.9)	-3.5	15.97 (2.2)	19.50 (1.0)	<b>Tangibles</b>
<b>P&lt; 0.001</b>	-2.3	21.84 (2.3)	24.14 (1.3)	-6.0	18.19 (2.1)	24.2 (1.5)	<b>Reliability</b>
<b>P&lt; 0.001</b>	-3.5	15.97(2.0)	19.56 (2.9)	-2.4	21.8 (2.3)	19.38 (1.3)	<b>Responsiveness</b>
<b>P&lt; 0.001</b>	-3.3	15.99 (2.1)	19.34 (1.0)	-3.3	15.99 (2.2)	19.38 (1.3)	<b>Assurance</b>
<b>P&lt; 0.001</b>	-3.3	20.59 (3.3)	24.20 (1.2)	-4.4	19.8 (2.9)	24.20 (1.6)	<b>Empathy</b>
<b>P&lt; 0.001</b>	-15.9	18.01(12.1)	21.48 (7.5)	-16.6	18.39 (11.7)	21.39 (6.6)	overall

Based on the findings of Table 1, the quality gap before the 5S management method implementation was more than other factors, in the dimensions of reliability -6, Empathy -4.4, Tangibles -3.5 score.

In general, the quality of services provided in the studied center was less than the expectations of the patients and was negative in all dimensions of quality gap score based on gap analysis after 5S adornment system implementation but the gap was very low in dimension of reliability (-2.3). Respectively Quality gap was more than other factors in the dimension of tangibles (– 3.5), assurance and empathy (-3.3). The study revealed that although the average score of expectations of the Ahvaz's community health center's patients is higher than their perception, the 5S implementation has decreased the gap to 0.7%, and in general in the studied center, the provided service quality is still less than the center patients' expectations.

## Discussion

The findings indicated that the 5S implementation significantly changed the service quality and the family health unit, nutrition unit, physician's office. This showed the positive impact of 5S implementation on the selected units (family health, nutrition unit, physician's office). The comparison before and after the implementation of 5S in the community health center, which include (organization, arrangement, standardization and discipline), also significantly changed.

The findings of our study were similar to Nouri et al. (2014, which show that the 5S audit score in the operating room before the implementation of this technique was 3.2 and after the implementation of the technique was 4.6 score [12]. In line with our research Nana et al. also concluded that the results of the 5S implementation seem to be satisfactory [19].

The present study also indicated that although after implementation of the 5S management method, the quality of provided services was still less than the patients' expectations, 5S implementation had decreased the quality gap from the patients' perspective in all studied fields. The results were similar to the Tak et al. study, which indicated that the 5S implementation is effective in raising staff incentive, decreasing the waiting time and satisfying patients from health services [20]. A study by Sharifirad et al. showed that there is still much room for improvement and reformation of the existing gap between patients' expectations and perceptions. Consequently, using quality promotion methods can help in conducting some measures to improve and reform this gap [21].

The present study indicated that the 5S, as a management tool or a model for implementing service quality promotion, doesn't cost a lot, in addition to being easily implemented. In a study carried out by Bakhshinik (2009) it was found that this model had a great impact on resources development. In this study, it was found that using proper methods in carrying out determined activities effectively led to productivity in related sectors and it was concluded that using them will have positive effects on the other systems needed by the organization [22]. Farrokhi et al (2012), implementing 5S project in the Operating Room, concluded that 5S should be used as a simple tool in the first step toward quality management activities and it can improve quality at lower cost [23]. Rexhepi (2011) and Waldhausen (2010), concluded that training and implementation of 5S workplace organization technique in hospitals demonstrated that this technique implementation improves environmental factors such as the workplace cleanliness, fast and easy access to the essentials as well as a pleasant workplace for staff [25, 26].

In this study, the best dimension of service quality (the smallest gap), observed after the 5S implementation was responsibility. In the study of Kebriaei et al. (2004), the highest mean gap was in the responsiveness dimension [27] and in the study of Wisniewski and Wisniewski (2005), it was in the dimension of reliability [28].

## Conclusion

According to the findings of this study, in order to continuously promote and evaluate the service quality, efforts should be made on decreasing the service quality difference in plans. Centers must be equipped with efficient and new tools and provide services in the promised and shortest time, staff and service providers should be available at the time of patient referral, get acquainted with modern knowledge and skills to respond to the patients' needs and understand the patients' values and emotions. On the other hand, given the fact that the greatest difference in the service quality was seen in the responsibility dimension, it is necessary to allocate funds to the health centers to provide the equipment, more attention should be given to staff responsibility in the plans and their commitment to the responsibilities taking into consideration the cultural features of the country, so that patients can be more relaxed and satisfied.

Given that only service recipients in the health center were studied, the results of this study can't be generalized to other fields of service provision in the healthcare system and other organizations. Therefore, it is advisable that each manager should carry out such research to develop the quality promotion program in his organization as a first basic step. In this case, they are expected to adopt a model with a higher degree of compliance to the center conditions and so more effectively promote the service quality and, provide services with quality beyond the recipients' expectations besides eliminating weak points.

The negative scores of the service quality observed in this study show that service providers are weaker in these dimensions. Therefore, the need to improve primary health service quality means that managers must use management tools and methods such as the 5S implementation, decrease the negative scores and bring perceptions as close as possible to expectations and promote patients' satisfaction from the received services by executing and planning appropriately.

According to the results of this study, we can conclude that the implementation of the 5S management method in healthcare centers is effective in the use of resources and promoting the service quality effectively. This issue can reduce the quality gap with the support of senior managers and the development of training in the dimension of participation attraction and attitudes promotion.

## Abbreviations

5S: Seiri, Seiton, Seisou, Seiketsu, Shitsuke; SERVQUAL: Service Quality

## Declarations

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### *Authors' contributions*

SS conceptualized and designed the study. SS, MK and AT collected the data, SS and KAA performed the statistical analyses and checked the analysis of the data. MK and SS drafted the manuscript. SS and AT was involved in the final revision of the manuscript. All authors read and approved the final manuscript.

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### *Availability of data and materials:*

The datasets of the current study will be shared on reasonable request from the corresponding author.

### *Ethics approval and consent to participate*

This study had an ethical code IR.AJUMS.REC.1395.801 from Ahvaz Jundishapur University of Medical Sciences. Written consent has been obtained from all participants in our study.

### *Consent for publication*

Not applicable.

### *Competing interests*

Authors declared no competing of interest.

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