



Original article

## IMPACT OF HEALTH EVOLUTION PLAN ON BETWEEN- HOSPITAL DISPATCHES OF ORTHOPEDIC SERVICE IN SHIRAZ MEDICAL SCIENCES UNIVERSITIES IN 2013-2014

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### ABSTRACT

**Introduction:** Today, health system, like any other event dependent to social conditions, requires effective evaluations for promoting condition and function improvement. The present study aims to examine the impact of health evolution plan on between- hospital dispatches of orthopedic service in Shiraz Medical Sciences Universities in 2013-2014.

**Methodology:** This study was performed with descriptive- analytical method in time period of 2013 and 2014. The research population included all orthopedic service dispatches which have been accomplished from hospitals of Fars province cities to hospitals settled in Shiraz. The research sample was coincident with the mentioned statistical population. The research information was received from Shiraz Medical Sciences University, medical care monitoring center and included data relating to dispatches such as non-existence presence of specialized physician in the hospital. Statistical analysis was performed using descriptive statistics and Chi-square, Mann-Whitney test and Z-test and by SPSS 22 software. **Results:** The number of dispatches with average age of 41 years (SD=22/78) before health evolution plan has been 209 cases and after evolution plan it has reached 279 cases with average age of 43 years (SD=22/38). The results showed that there is a significant difference between before and after health evolution plan based on non- existence of specialist and also need to operation room ( $p<0.05$ ). also, the results revealed that there is no significant difference between before and after evolution plan based on specialist presence, empty bed, department or respective service, tendency to private hospital, the patient financial problem, time of getting admission and time of admission registration ( $p<0.05$ ).

**Conclusion:** Health evolution plan has been successful in the field of specialist existence in cities while, in the field of reducing dispatches from cities to center of province hasn't performed successfully. Regarding the importance of between- hospital dispatch issue and expectations envisaged from evolution plan, it seems that despite the obtained changes, fundamental amendments are necessary to achieve the optimal result.

**KEYWORDS:** health evolution plan, between- hospital dispatches, orthopedic service

### INTRODUCTION

Today, modification of health system for establishing justice and promoting health system processes quality is considered among the first priorities of governments in most of the world countries and <sup>[1]</sup> regarding multiple pressure imposed on treatment cadre in health system which causes burnout and service quit due to it, health system modification will be definitely useful and effective for both patients and treatment personnel <sup>[2]</sup>. For achieving these goals, Islamic Republic of Iran has designed related upper hand documents and 20 –years' vision plan and fifth development plan are among them <sup>[3]</sup>. Recently, the Supreme Leader has imparted

health general policies in all of which justice in health and qualitative gradation of health system processes have been seriously emphasized by policy makers <sup>[4]</sup>. But, despite the performed efforts, excessive costs of health have increased during the last years and necessity of health system modification was evident <sup>[5]</sup>.

Eleventh government turned health as one of main priorities. Eight health service packages for reaching this goal were imparted and made effective since 15.2.93 under the title of health system evolution plan. After passing 18 months since execution of this plan, it has been specified that regarding comprehensiveness of health system evolution plan and despite its potential profits, non-monitoring of weaknesses

can draw off the plan from its main objectives [6], whereas, some of its weaknesses are appearing gradually [7]. In this respect, health system evolution plan tries to manage problems in this section by administering physicians settling and residing packages. The results obtained from the conducted studies about administering health system packages shows a kind of contradiction in results so that some studies indicate gradation of between- hospital reference system function [8] and reduction of discharge against medical advice [9] and desirability of indexes gradation [3]. On the other hand, some researches show lack of efficiency increase in governmental hospitals of deprived regions [10], non-observation of patients' reference system [11], incapability of leading staff and need to more effort in this field [12].

Also, future studies are indicative of great distance between the plan objectives and ideals [13]. But, what is sure is that between- hospital dispatches which occur due to non-presence of specialized physician and other related factors impose additional costs on health system and the patient [14]. Therefore, we should promote efficiency and effectiveness of health system by offering scientific approaches by conducting purposeful researches and endeavor in the direction of all people access to health system [15]. One of major challenges which have created many problems for health system during the last decades and shows necessity of more studies during the plan administration is between- hospital dispatches from small towns to large cities [16]. This matter has always been accompanied with medical mistakes occurred in the way due to shortage of appliances and facilities existing in the ambulance, lack of enough experience of the respective personnel and occasionally ambulances accident and imposing additional cost to health system and the patient, moreover, considerable statistics of between- hospital dispatches shows planning importance in this ground [17].

This study is going to prepare suitable answer to the existing contradictions and provide an index- based solution for monitoring physicians settling and residing packages by comparative survey between reasons and factors effective on between- hospital dispatches before and after health system evolution. Also, this study can provide managers and policy makers a suitable approach for resolving defects and as a result, by increasing its efficiency and effectiveness, prevents from imposing additional cost to health system and patients and help evolution plan as much as possible for achieving final goals.

## **MATERIAL & METHODOLOGY**

This study is applied in respect of objective and was conducted by descriptive- analytical method in a time period between second half of 2013 to second half of 2014. It should be mentioned that health evolution plan was made effective since second half of 2013 and in this study, data relating to

between- hospital dispatch which was collected in the first period of evolution plan administration that is the last 6-months of 2014, was compared with its previous corresponding period, i.e. the last 6- months of 2013 (before health evolution plan). This research population included all orthopedic service dispatches accomplished in training hospitals and hospitals covered by Shiraz Medical Sciences University. Origin or dispatching the orthopedic patients hospitals were all hospitals settled in Fars province cities and acceptor hospitals of orthopedic patients were hospitals settled in Shiraz city. In this study, regarding the importance of between- hospital dispatch issue total research society was studied and sampling was not performed and as a result, the research sample is equal to research population. The present study domain includes Shiraz medical sciences and health treatment services hospitals settled in Fars province cities which performed between- hospital dispatch of orthopedic service in 2013 and 2014, that we can name hospitals of Beiram Aliasghar, Jahrom Setad Hedayat, Estahban Imam Khomeini, Darab Imam Hassan, Eghlid Valie Asr, Sepidan Imam Hossein, Abadeh Imam Khomeini, Saadat Shahr Imam Sadigh, Bavanat Valie Asr, Sarvestan Shohada. And also Shiraz medical sciences and health treatment services hospitals settled in Shiraz which have accepted orthopedic service patients in 2013 and 2014. These hospitals include: hospitals of Shahid Chamran, Namazi, Ordibehesht, Shahid Rajaie and central hospital. This study basic information was acquired by coordination of Shiraz Medical Science University vice chancellor in treatment affairs and from monitoring center of medical care system (MCMC).

## **RESULTS**

Findings showed that in 2013 orthopedic dispatches have been 209 cases and in 2014 279 dispatches have been performed. In 2013, there were 147 male patients (70.3%) and 62 female patients (29.7%) and totally 209 orthopedic service patients who were dispatched between hospitals. In 2014, 211 male patients (75.6%) and 68 female patients (24.4%) and totally 279 orthopedic patients have had between- hospital dispatch. Average age of patients before health evolution plan has been 41 years ( $SD\pm 22.78$ ). Average age of patients after health evolution plan has been 43 years ( $SD\pm 23.38$ ). also, 111 cases of dispatch (53.1%) in 2013 have taken place due to lack of specialist but 42 cases of dispatch (15.1%) in 2014 have been due to lack of specialist. 24 cases (11.5%) of dispatches in 2013 have occurred due to non-presence of specialist in the hospital but in 2014, 42 cases (15.1%) of dispatches have occurred due to non-presence of specialist. 55 cases (26.3%) of dispatches in 2013 have been because of lack of respective department or service in the hospital but in 2014 ,69 cases of dispatches (24.7%) have been due to lack of respective department or service in the hospital. In 2013, no dispatch has taken place due to lack of empty bed but in 2014, 2 cases (7%) of dispatches have taken

place due to lack of empty bed. 21 patients (10%) in 2013 have been dispatched because of need to operation room but 10 patients (3.6%) in 2014 were dispatched because of need to operation room. 11 patients (5.3%) in 2013 have tended to private hospital. 23 patients (8.2%) in 2014 have tended to private hospital. 1 patient (0.5%) in 2013 has been dispatched due to financial problem. 1 patient (0.4%) in 2014 has been dispatched due to financial problem. 1 patient (0.5%) in 2013 and 3 patients (1.1%) in 2014 have withdrawn dispatch (that the patient withdrawal is different with other research variables which are discharge with personal consent and the origin hospital withdrawal). In 2013, 4(4.3%) cases of hospital withdrawal from dispatch were observed. In 2014, 6 cases (2.2%) of hospital withdrawal from dispatch were observed. In 2013, 8 cases (3.8%) of discharge with personal consent were observed. In 2014, 11cases (3.9%) of discharge with personal consent have occurred.

**Table 1. Summary of descriptive data**

		frequency	percent
patient withdrawal from dispatch	2013	1	0.5
	2014	3	1.1
origin hospital withdrawal	2013	9	4.3
	2014	6	2.2
discharge with personal consent	2013	8	3.8
	2014	11	3.9
lack of specialist	2013	111	53.1
	2014	42	15.1
non-presence of specialist	2013	24	11.5
	2014	42	15.1
lack of department	2013	55	26.3
	2014	69	24.7
lack of empty bed	2013	-	-
	2014	2	0.7
need to operation room	2013	21	10
	2014	10	3.6
tendency to private hospital	2013	11	5.3
	2014	23	8.2
the patient financial problem	2013	1	0.5
	2014	1	0.4

For analysis of the research inferential data, Chi-square test and also Wilcoxon test which is used for comparing an abnormal quantitative variable in two dependent positions were used. it should be mentioned that significance level of  $p < 0.05$  was considered that the results of this analysis showed that there is a significant difference between before and after health evolution plan based of non-presence of specialist and need to operation room ( $p < 0.05$ ). also, the results revealed that there is no significant difference between before and after evolution plan based on specialist presence, empty bed, respective department or service, tendency to private hospital, the patient financial problem,

time of getting admission and admission registration time ( $p > 0.05$ ).

## DISCUSSION

As the results showed, lack of specialist physician has decreased about one third after evolution plan. In other words, a significant difference was found before and after evolution plan in regard of lack of specialist physician (first hypothesis). Lack of specialist physicians in medical sciences university hospitals which are settled in Fars province cities is one of concerns whose evaluation was noticed in this study after health evolution plan. The rate of dispatches which have occurred due to lack of specialist physician after evolution plan have reduced comparing to before evolution plan. In previous researches, non-disposition and lack of motivation of specialist patients for presence in cities and especially more deprived regions has been reported. It seems that lack of specialist physicians in cities has been decreased but this issue in itself can't show effectiveness of health evolution plan. Also, it was specified that the rate of specialist physician non-presence in hospitals orthopedic service has reduced and a significant difference was found between before and after the plan in this variable. Though, hospitals settled in cities had specialist physicians in orthopedic service but this study's results showed that the rate of specialists' presence in hospitals has not only increased but it has decreased. Studies which had examined non-presence of specialist physician in cities hospitals before health evolution plan, have reported a considerable dissatisfaction about this issue [18-19]. It seems that this problem still exists. Orthopedic problems, especially those which require operation, are not solvable with new technologies like Telemedicine [20]. And regarding owning specialist forces, using virtual hospitals and bearing costs in this respect seems less necessary [21].

Another studied variable was comparing cities hospitals in respect of between hospitals dispatches due to lack of respective department or service. The number of orthopedic service dispatches due to lack of respective service or department after evolution plan has increased but regarding increase of dispatches, dispatch percent hasn't decreased comparing to before evolution plan. Though this increase is not so much (14 patients), but it is expected that orthopedic service patient dispatch due to lack of respective department or service decreases after evolution plan. And also, no significant difference was found in orthopedic service patient before and after evolution plan. In other words, the evolution plan hasn't been effective based on lack of respective service or department. On this basis, future studies can examine the relation between non-presence of specialist physician and lack of respective department or service despite lack of specialist reduction and based on the obtained results provide some applied solutions with more conclusiveness in

this respect. Moreover, we can consider lack of respective department or service as one possible reason for specialist physicians' non-presence. Then, comparative- scientific research guidance could be helpful for examining the scientific relation.

Before health evolution plan (second half of 2013), no report was found according to dispatch due to lack of empty bed. After evolution plan in the second half of 2014, some cases, though few, were reported who were transferred from cities hospitals to Shiraz due to lack of empty bed. So, evolution plan has not only been effective on between- hospital dispatches but the need for empty bed has been felt more. By increasing the rate of orthopedic service patients dispatch which may be due to various reasons such as accidents and so on. The need to empty bed will become more and in future, we can prevent from dispatch due to lack of empty bed by providing more hospital beds. Before health evolution plan, the reason of 10% of between- hospital dispatches has been need to operation room. In other words, lack of operation room in cities hospitals has caused 10% of orthopedic patients dispatch to Shiraz. This rate have has a considerable reduction after health evolution plan since during the research fifth hypothesis study, a significant difference was found between before and after health evolution plan based on operation room need. Based on this study's findings after health evolution plan, the rate of orthopedic service dispatches which have been performed due to lack of operation room, has increased, so that we can say the health evolution plan has been effective on between- hospital dispatches of orthopedic service patients. Based on this function (improvement of cities hospitals operation room status), we can observe promotion of between hospitals reference system function in this field. The rate of patient tendency to private hospital has increased after health evolution plan. In other words, the number and percent of dispatch to private hospitals has increased after health evolution plan. No significant difference was obtained between dispatches based on tendency to private hospital before and after evolution plan on this study. On one hand, dispatch to private hospital could decrease patients' crowd in hospitals especially training ones. But, on the other hand, patients will bear heavier costs. Designing some plans for balancing costs in private hospitals and also improvement and increase of hospital space and required force for medical team in training and non-private hospitals could be noticed.

In evaluating health evolution plan, one of cases which can specify desirability of indexes gradation is patients' financial problem. Before evolution plan, one of reasons of dispatch has been the patient financial problem and also after evolution plan one case of between- hospital dispatch from the city to Shiraz has been reported which has been due to

the patient financial problem. Before and after health evolution plan, no significant difference was found between the dispatches rate due to the patient financial problem. This issue could be considered by respective authorities. In this study, the patient withdrawal from dispatch was compared between before and after evolution plan. It should be mentioned that the patient withdrawal from dispatch may have reasons such as impossibility of the patients' family presence in Shiraz or such reasons. In this condition, the patient whose dispatch necessity has been confirmed by medical team will be away from treatment and consequent orthopedic problems won't be unexpected. In this study, no significant difference was found between the two stages of before and after evolution plan based on the patient withdrawal from dispatch. In other words, the evolution plan couldn't decrease the patients' withdrawal from dispatch.

The origin hospital withdrawal from dispatch was among cases which caused the patient dispatch process cancellation. When the origin hospital takes admission from one of Shiraz hospitals, due to reasons such as lack of empty bed or so on, and then don't perform the dispatch, it seems that the existing problem (for example empty bed) has been solved. However, regarding the results, no significant difference was found between before and after evolution plan based on the origin hospital withdrawal. Though the problem solving was propounded due to the origin hospital withdrawal from dispatch, but this issue could indicate shortages since the emergency patient problem solving in the last minutes before dispatch and restarting the medical procedure in the origin hospital will be time consuming. Among other possible reasons of the origin hospital withdrawal, we can point to cases which are not related to hospital like road or climate problems which should be considered in the dispatches field.

In this study, two stages of before and after evolution plan was compared based on discharge with personal consent that no significant difference was found. In other words, the evolution plan couldn't reduce the rate of discharge with personal consent. Cases whose reason of non-dispatch has mentioned discharge with personal consent were among cases where their dispatch necessity has been specified but before admission receiving from Shiraz hospital, the patient or his family have abstained the treatment continuing with personal consent. The patient whose dispatch necessity has been recognized, very likely haven't had stable or non-traumatic status but despite this he has withheld the treatment continuing and such cases could be pursued by authorities since some of these of discharge with personal consent may be due to marginal problems created in the origin hospitals.

The time duration of getting or receiving admission is another studied variable in this research. The time duration of getting admission after health evolution plan has decreased a little comparing to before health evolution plan. The eighth hypothesis of this research was rejected and no significant difference was obtained between the time duration of getting admission. But, in this study, we observed reduction of getting admission time after health evolution plan. This time reduction, though little, but could be promising since in some cases we observed that receiving admission from destination hospital has reached several hours.

This is whilst the time of admission administration or registration has increased after evolution plan, though this difference wasn't significant. Although, the time of admission administration or registration has less significance than getting admission, but we shouldn't forget that in between-hospital dispatch seconds could be valuable.

## CONCLUSIONS

In this study, the rate of between- hospital dispatch before and after evolution plan was examined. The dispatched cases in orthopedic service have increased after health evolution plan. The number of male patients, who had between-hospital dispatches after health evolution plan, has increased comparing to before health evolution plan. The ratio of men to women has also increased in between- hospital dispatch after health evolution plan. About women, their number has increased after health evolution plan but the ratio of women to men in between- hospital dispatch has decreased. By health evolution plan becoming effective, there was this expectation that the dispatches rate decrease. But as the results showed the number of dispatches have increased.

The average age of orthopedic service patients who have had between- hospital dispatches have been less after evolution plan. After health evolution plan, the number of people below one year old who had between- hospital dispatches have become twice and their average age has become almost halved. Damages which are incurred the infant before 1 year old could influence the individual life span. Here, the necessity of preventive trainings shows its importance. On the other hand, between- hospital dispatch especially from one city to another delays the time of orthopedic measurements performance. This late attending to the patient may leads to undesirable implications that their compensation is not possible. After health evolution plan, the rate of the origin hospital withdrawal from dispatch has decreased. On one hand, we can consider this reason that the problem which was the cause of dispatch has been dissolved, like attendance of the specialist physician after getting admission from the destination hospital. On the other

hand, appearance of problems such as vehicles or other cases could be considered as possible factors of the origin hospital withdrawal from dispatch. This matter could be considered as a topic for future studies.

The rate of discharge with personal consent is another case which has increased after health evolution plan. Discharge with personal consent may occur in cases where the patient family feel their patient could be discharged but the medical team seeks to make the patient status more stable or evaluate him more to make him ready for discharge. In such cases, the patient discharge may follow some risks for him. Though the responsibility of future possible problems won't be with the hospital anymore, but in some cases, non-training supervisor could give necessary guidance to the patient family and prevent from discharge with personal consent and possible problems partly.

As it was discussed in the argument about hypotheses, health evolution plan has created changes only based on the cities hospitals possessing specialists and not the specialists' presence. This matter could take critical load in the first look but the evolution plan is new and maybe it has passed the first stage of specialists' presence in cities. In the next stages which are the consequence of such studies, we should seek increasing of the specialists' presence rate in cities hospitals. Other problems which showed themselves in this study and could be resolved, were cases related to facilities and equipment. Though this study showed that the need to operation room has improved after evolution, but lack of respective department or service and also empty room still have remained as a part of problems. Another case which may be discussed as a factor of dissatisfactory with governmental hospitals is the patients' tendency to private hospitals that its rate has increased. This issue is notable in another aspect. If private hospitals impose lower financial load on the patients and some schemes are done in this regard by respective organizations, the content of patients referring to governmental hospitals will be reduced and the quality of services provided in these hospitals will be more effective. Generally, we should confess those other variables which were not examined in this study, shouldn't be neglected and their possible effect on increasing between-hospital dispatch could be considered. For example, the rate of admissions which are performed in cities hospitals in orthopedic service (which were dispatched if it was before evolution plan) may have increased too, that this issue could be following increase of road accidents and so on.

Anyway, every new national plan especially in its first steps requires revision and continuous modifications. In this study, this matter was well reflected.

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