

**THE RELATIONSHIP BETWEEN HEALTH INFORMATION MANAGEMENT AND PATIENTS' TREATMENT PROCESS IN FAMILY PHYSICIAN PLAN IN SHIRAZ IN 2016**<sup>1</sup>Atefe Brumandi, <sup>2</sup>Somayeh Hessam and <sup>3</sup>Abbas Ghavam<sup>1</sup>Department of Healthcare Management, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran.<sup>2</sup>\*Assistant Professor, Department of Health Services Administration, South Tehran Branch, Islamic Azad University, Tehran, Iran.<sup>3</sup>Assistant Professor, Department of Environmental Science, Institute of Sciences and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.**\*Corresponding Author: Somayeh Hessam**

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**ABSTRACT**

**Objective:** The present research aims to study the relationship between health information management and patients' treatment process in family physician plan in Shiraz in 2016. **Method:** This is a surveying study and statistical population includes all family physicians (5105 people). Based on Morgan sample size table, 358 were determined as the sample. Finally, 331 successful questionnaires were completed. The researcher-conducted questionnaire was used to collect information. The face validity of the questionnaire was confirmed by professors and the construct validity was confirmed by exploratory factor analysis. In addition, the reliability was confirmed by Cronbach's alpha test. To analyze collected information, Pearson correlation coefficient, regression and SPSS 22 were used. **Results:** correlation results show that health information management (correlation coefficient: 0.27) has a direct and positive relationship with patients' treatment process. Furthermore, regression results showed that variables of information storage & retrieval, data analysis & transfer and managerial factors were entered the model and explored 78.3% (R<sup>2</sup>) of variance for treatment process variable. **Conclusion:** Regarding health information management, it is recommended that authorities pay attention to related issues.

**KEYWORDS:** Family physician, treatment process, health information management.**INTRODUCTION**

Family physician plan has been implemented in rural regions and the cities below 20000 populations since 2005. One of the most important responsibilities of family physician plan is to offer primary healthcare services. It is impossible to use the term "family physician" without offering such services because all health services to the population under coverage of family physician plan are offered actively. The general practitioners, as the main executor of primary healthcare system, have a key place. Therefore, it is preferred to determine their roles among doctors and paramedics (Grayli, 2010). Registration of doctors or insurance tracking are done by Iranian health system and electronic systems. In addition, all people who are enrolled by the family physician will have on line electronic health record based on standards of Iranian general health system (Bahrainian, 2010). The family physician and healthcare team are responsible for registering electronic health record, basic edits and record of all measures, referrals and outcomes of health-therapeutic services and diagnosis in online records based on instructions

announced by the ministry of health. Therefore, electronic health record is a set of information related to health of citizens and such information is stored electronically during the life and it is available for authorized people without limitation in time and space. Thus, healthcare service centers should be equipped with informational system to store health information of citizens in addition to presented healthcare services. It is necessary to provide requirements for establishment of such system thus establishment of electronic record is operationalized. It should be noted that information of health record is confidential and it is only available for authorized people (Bahrainian, 2010).

Acceptance of information technology, improvement of healthcare quality and reduction of prices are great challenges for providers and customers. Therefore, they encounter important events such as exchange of a large size of clinical and non-clinical information in a department and throughout clinical systems. On the other hand, rapid access to clinical data in patient's care location, making sure to keep data integration by

removing source mistakes and optimization of clinical work circulation are vital in increase of quality. Therefore, integrating healthcare enterprise was established with aims of improving integration and interaction between health information systems in HIT systems in health centers (Ebrahimi et al, 2015).

Referral system acts as a communication bridge and directs service providers and clients from the lowest to the highest levels and vice versa. Since hospitals, as one of the most important social organizations, play a critical role in improvement of health status of Iran and presentation of health-therapeutic services and they are also one of the most sensitive organizations, data have to be collected and implemented correctly and they have to be available for hospital decision makers after refining, classifying and inferring appropriately (Nopasand Asil et al, 2014). Regarding background review of domestic researches, Tavakoli (2006) studied health information management in emergency departments of hospitals affiliated to Isfahan medical science university. She concluded that Alzahra hospital recorded the highest amount of information and identity data in records of emergency patients and the lowest amount was recorded in Kashani hospital. Moreover, statistical data were studied, collected and recorded from 70% of emergency departments in hospitals. Nopasand Asil et al (2016) studied the role of hospital information systems and hospital performance regarding patients' satisfaction from views of hospital personnel in Rasht. This is a cross-sectional, descriptive-analytical research. The statistical population is personnel who are working in hospitals containing information system in Mashhad and they were collected by information questionnaire. Results indicated that presence of hospital information system and its subsets caused satisfaction of patient and promotion of hospital performance. In foreign researches, Davis (2002) concluded in his research that none of centers under study used qualitative analysis while qualitative analysis is one of the most important analyses of medical records. Analytical results will identify defects and poor documentations. Error correction is an important issue in protection of patient's record because it is necessary to delete information that

should not be recorded. Corrections should be done in a way that incorrect data are as clear and transparent as correct information. In a paper, Warder et al (2015) studied health information technology: key element, experience and patient. In this study, the relationship between health information technology, patient experience, looking comprehensively for patient's satisfaction and technology has been investigated. As a result, 35 papers related to the study were reviewed. Results indicated that the technology and patient's experience are closer to moving to another pass. HIT is changing as a key element in patient's experience. Concerning the extension of family physician plan in Iran and increase of population under coverage, it is required to see whether there is a relation between patients' health information management in family physician plan and treatment process of patients.

### Research method

This is a descriptive-surveying research. Statistical population of the research includes all family physicians (5105). To determine the sample size, Cochran table was used. Regarding the table, 358 samples were chosen among 5105 physicians. The questionnaire was distributed between physicians. The researcher conducted questionnaire was used based on combined theoretical framework. The questionnaires were based on five-point Likert scale (very low, low, average, high, very high). The scores ranged from 1 to 5 (from very low to very high). The questionnaire contains 27 items. Validity index of items was in form of face validity confirmed by professors and construct validity of the questionnaire was confirmed by exploratory factor analysis. The reliability of the questionnaire was obtained by Cronbach' alpha coefficient which was 0.79 for overall questionnaire. The results were expressed by descriptive and inferential statistics and SPSS.

### RESULTS

To use parametric tests for study of research hypotheses, normalization of variables was determined using Kolmogorov-Smirnov method (by observing table 1 and studying significance of all subscales which is above 0.05).

**Table 1: testing results of variable normalization**

	Treatment process	Information management	Information collection	Information collection	Information collection	Information collection
Number	331	331	331	331	331	331
Kolmogorov-Smirnov	0.98	1	0.59	0.89	0.98	0.92
Significance level	0.28	0.18	0.87	0.39	0.28	0.35

As seen in table 2, concerning correlation coefficient and significance level ( $r=0.27$ ,  $P= 0.001$ ), there is a positive and significant relationship between health information management and patients' treatment process. Concerning correlation coefficient and significance level ( $r=0.24$ ,  $P= 0.001$ ), there is a positive and significant relationship between information collection and patients' treatment process. Concerning correlation coefficient and

significance level ( $r=0.028$ ,  $P= 0.15$ ), there is a positive and significant relationship between information storage & retrieval factor and patient's treatment process. Concerning correlation coefficient and significance level ( $r=0.30$ ,  $P= 0.001$ ), there is a positive and significant relationship between data analysis & transfer factor and patients' treatment process. Concerning correlation coefficient and significance level ( $r=0.32$ ,  $P= 0.001$ ),

there is a positive and significant relationship between managerial factors and patients' treatment process.

**Table 2: results of Pearson correlation test**

Statistical index and variable	Pearson correlation coefficient	Significance level
Health information management and patients' treatment process	0.27	0.001 *
Information collection and patients' treatment process	0.24	* 0.001
Information storage & retrieval and patients' treatment process	0.15	* 0.028
Data analysis & transfer and patients' treatment process	0.30	* 0.001
Managerial factor and patients' treatment process	0.32	* 0.001

Health information management is divided into four components including information collection, information storage & retrieval factors, data analysis & transfer factors and managerial factors. All independent variables were entered the equation and analysis and criterion variable is patients' treatment procedure to study

their significance in multiple analysis. Table 3 shows that variables of information storage & retrieval, data analysis & transfer and managerial factors have been included in the model and the factors explored 78.3% variance of treatment process variable.

**Table 3: multivariate regression model of patients' treatment process.**

Step	Variable name	Significance	F	Standard error	Added R2	R2	R
Step 1	Information storage & retrieval	.000	155.256	4.08590	.632	.636	.797
Step 2	Data analysis and transfer	.000	145.338	3.28154	.762	.768	.876
Step 3	Managerial factors	.000	104.679	3.18874	.776	.783	.885

Beta value in table 4 shows that the variables of step 1 (information storage & retrieval factor), step 2 (data analysis and transfer factor) as well as step 3 (managerial

factors) have direct and positive correlation with dependent variable.

**Table 4: The variable included in the model (patients' treatment process)**

Variable	Variable name	B	Beta	T	Significance level
X1	Information storage & retrieval factors	1.139	.726	12.182	.000
X2	Data analysis & transfer factors	.744	.326	6.257	.000
X3	Managerial factors	.314	.152	2.489	.015
Constant value		7.752		1.204	.232

Therefore, it can be said that dimensions of health information management that were effective on treatment process and managers performance have been 1- information storage & retrieval factors, 2- data analysis and transfer factors 3- managerial factors respectively. They played basic roles in treatment process such that 78.3% variance of patients' treatment process has been explored by these variables.

## DISCUSSION AND CONCLUSION

The present research addressed the relationship between health information management and patients' treatment process in family physician plan in Shiraz in 2016. As seen in results and concerning correlation coefficient and significance level ( $p=0.001$ ,  $r=0.27$ ), there was a positive and significant relationship between health information management and patients' treatment process. Therefore, based on significance level, the research hypothesis is confirmed. The result is consistent with following researches: Vahdat *et al.* (2006) addressed information management standards in validation organizations and their effects on different aspects of electronic records as well as their influence on establishment of such systems. A descriptive-

comparative study was conducted on information management standards in the USA, New Zealand and Canada. Results showed that information management standards in above countries focus on timely record and completion of information using standard labeling & classifying systems, applying systems for collection of different data, integration of data from inside and outside the organization and information confidentiality. Furthermore, Tavakoli (2006) concluded in her research that Alzahra hospital recorded the highest amount of information, identity data in records of emergency departments and Kashani hospital recorded the lowest amount of information. In addition, statistical data were collected and recorded from 70% of emergency departments. Establishment of information management system in hospitals improved organizational performance of Koodakan Bahrami hospital. Ajami (2012) concluded that timely information and data were not collected sufficiently and appropriately and the reports of different organizations were sometimes contradictory. The technique of criterion-based prioritization showed that the status of health ministry is excellent and that of other organizations is good. Asadi *et al.* (2012) concluded that presence of dynamic outpatient care information

management was critical. Therefore, the processes and regulations related to collection, storage, processing and distribution of information should be corrected and considered in outpatient care information management system. There is a positive and significant relationship between information collection and patients' treatment process. The research hypothesis was confirmed based on significance level. Khalafi et al (2013) evaluated the performance of family physician plan in Kerman medical science university. Data were collected using statistical forms in routine statistics & information system based on three aspects of technical performance, human and facility sources and financial sources in regions under coverage of Kerman medical science university. According to results, in spite of relative improvement in some indices, the attraction and drops of physicians in the plan showed that their retention was not desirable. Concerning that human source is one of the key indices in improvement of plan performance, it requires a strict attention. Therefore, concerning qualitative and quantitative extension of the plan to urban regions with greater population, the plan should be promoted and improved. There was a positive and significant relationship between information storage & retrieval factors and patients' treatment process. Therefore, the hypothesis is confirmed based on significance level. The result is consistent with following researches. In the paper titled as "the role of information and communication technology in health management in Iran with a prospective perspective", Frahmandian et al (2014) tried to introduce and identify the function of healthcare system. Then, they studied current healthcare system in Iran. Three basic applications of communication and information technology in electronic health medicine, remote medicine and mobile health were introduced and their different dimensions were studied. The library method was used to study aforementioned aspects with focus on how the increasing growth of communication, telecommunication and informatics industries has created a new movement in the world and how new health & medical world has benefited from such growth. The study shows that the development of aforementioned technologies in medical science will create a great transformation in healthcare service system in near future. Patient's information storage system, pharmaceutical information systems, surgical-therapeutic systems, treatment follow up system, remote treatment systems, road nursing systems, surgical robots and patient admission systems and many other systems are among future transformations in global healthcare system. these modern tools have one joint goal which is to facilitate treatment. Khalifa et al (2015) addressed the admission and satisfaction of hospital information systems in Moraghebat Ali hospital. Results show that hospital access to computers is one of the most effective factors with special emphasis on laptop access. The computer is placed on four wheels to enter directly information and to retrieve them.

The suggestions are: three major areas of system performance, organizational support and users feedback have been improved. In addition to presence of computer in healthcare setting, user friendliness and new innovative methods for data entrance such as automatic alarm are recognized. Therefore, the work load is improved and information quality is increased. Organizational support is very important. There is a positive and significant relationship between data analysis & transfer factors and patients' treatment process. Such hypothesis is confirmed based on significance level. The result is consistent with following researches: Huffman (1994) believes that internal organization of outpatient records should be regulated based on the requirement of those who everyday deal with such records. He added that any outpatient care center should use a proper structure for internal organization of records. Davis (2002) concluded in his research that none of centers under study used qualitative analysis while qualitative analysis is one of the most important analyses of medical records. Analytical results will identify defects and poor documentations. Error correction is an important issue in protection of patient's record because it is necessary to delete information that should not be recorded. Corrections should be done in a way that incorrect data are as clear and transparent as of correct information. There is a positive and significant relationship between managerial factors and patients' treatment process. Such hypothesis is confirmed based on significance level. The result is consistent with following researches: In their paper, Asadi et al addressed hospital managers' attitude towards the complaint investing system in hospitals affiliated to Mashhad university of medical science. Concerning the role of managers in improvement of healthcare service quality, the study was conducted on hospital managers' attitude towards the complaint investing system in hospitals affiliated to Mashhad university of medical science in 2015. This cross-sectional-descriptive study was conducted on 12 hospitals affiliated to Mashhad university of medical science. It is important that managers pay attention to staff satisfaction and their educational needs for reduction of patients' complaints. Khalifa et al (2015) addressed the effect of health information technology on healthcare provider. The health information management predicted patients' treatment process in family physician plan in 2016. Results suggest that information storage & retrieval, data analysis & transfer and managerial factors have explored 78.3% variance of patients' treatment process. It can be said that dimensions of health information management that were effective on treatment procedure and managers performance have been 1- information storage & retrieval factors, 2- data analysis and transfer factors 3- managerial factors respectively. They played basic roles in treatment process such that 78.3% variance of patients' treatment procedure has been explored by these variables. Michel showed that among factors affecting application of information technology, technological advance, increasing the number of computers in different

wards of hospitals and making a mechanized information systems in wards and hospitals played the most important roles. In hospitals under study, in spite of different hospital policies, providing information system has been an important factor in strategic planning, Cooch conducted a research in Santa Clara hospitals and concluded that there was a close relationship between application of information technology and success of work processes. The results were consistent with those of Scott who studied efficiency of information systems. In hospitals under study, application of information technology has been one of organizational goals in all hospitals. hospital managers with collaboration of information technology experts and medical council will determine strategies of information technology based on organizational strategies and informational requirements of clients. Promotion of patients' treatment process has been among basic goals of health information systems. To reach such goal, computer systems are seeking to meet informational needs of therapists via improving data precision, timeliness, reliability and access. Therefore, decision makers require accessing to on time and valid information for making reasonable decisions. All hospitals under coverage of family physician plan in shiraz considered validation of standards for timely record of information and data, information storage & retrieval, data analysis and transfer. On the other hand, there is a close relationship between making correct decisions, improvement of patients' treatment process and the increase of data quality. In this direction, medical records in referral system & health physician plan were the most important sources of information for making decisions on patients' treatment and collecting data in hospitals under coverage of family physician plan in Shiraz. Adequacy of medical records shows quality of cares offered by therapists but those records with poor quality cannot be used as reliable informational sources for making decision and improving patients' treatment process in the healthcare system. In fact, to prepare medical documents in family physician plan, patients require documentation of all data related to patient's care. Such data are kept in a special centralized place. The integration of continuous care, productivity management and results' evaluation and analysis will improve treatment quality of patients in family physician plan. This requires integrated patient's care information via computer system. Therefore, a system which collects, links and combines different informational sources inside and outside the hospitals has been considered in standards of hospitals under study. Labeling & classifying systems are among requirements of family physician plan. Such systems are used for effective performance of data elements of patients and increase of treatment process, for facilitation of adaptation and validation of data elements. Thus, collected data can be used to analyze data, to monitor quality, to determine proper performance and to support other clinical and operational researches. In hospitals under study, a standard and known method has been considered to code, classify and define data in standards related to evidence-

based decision making thus it causes easy access to information of patient's record and increase of risks related to violation of information confidentiality. Therefore, one of responsibility of managers is to train how to keep such data. In this regard, all organizations under study considered in their standards educational services to users in order to keep information confidential and secure. Accessibility of health-therapeutic information has been another factor in improvement of patients' treatment process in hospitals under study. In addition, hospital information management system as well as clinical decision support and computerized registration of physician's orders have increased easy access and obedience of treatment team from clinical instructions. Patient instruction and proper relationship between members of treatment team are other important factors in hospitals under study that improved the quality and effectiveness of care outcomes and patients' treatment process.

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