



***IMPACT OF MEDICAL RECORD QUALITY ON DISCHARGE WAITING
TIME AT PRIVATE TEACHING HOSPITALS IN MASHHAD - IRAN***

NASSER GOMMNAMI

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By

NASSER GOMMNAMI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

February 2016

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DEDICATION

This Thesis is dedicated to my beloved wife, Golnaz and my sweet hearts girls and son, Saba and Ali who have supported and encouraged me all the way since the beginning of my PhD studies at UPM. Since without their encouragements, I would never be able to accomplish my research. Besides, special thanks goes to my mother, sister and brother and also father in law and mother in law Mr. and Mrs. Hajyousefi, with their precious time to give me spiritual supports and encouragements. I feel I am spiritually in debt of my family, and to the memory of my father who were motivated me for educating through my life journey. Finally, this thesis is dedicated to all those who believe in the richness of learning.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the Degree of Doctor of Philosophy

IMPACT OF MEDICAL RECORD QUALITY ON DISCHARGE WAITING TIME AT PRIVATE TEACHING HOSPITAL IN MASHHAD- IRAN

By

NASSER GOMMNAMI

February 2016

Chairman : Associate Professor Muhammad Hanafiah Juni
Faculty : Medicine and Health Sciences

Introduction: Patient documentation is central to patient care. Proper documentation effects on safety and continuing of care. Incomplete patient records ranged from 22 to 100% in Iranian hospitals and resulted to increased patient length of stay and increased discharge waiting time. Medical record quality consisted of four components; reliability that used for stability and consistency of data, accessibility of patient data that essential for risk management and healthcare costs, accuracy for coding and lastly completeness of the medical record. The study aims to determine the impact of medical record quality on discharge waiting time in private teaching hospital.

Methodology: An intervention study was carried out at two private teaching hospitals in Mashhad Iran, whereby pre, post and follow up intervention measurement were taken. Hospitals had two matched wards; that are male and female wards with surgical and internal medicine patients. Sample size was 146. After discharge ordered by doctor measurements on discharge waiting time were recorded in the pro-forma with 7 items, and medical record quality components with 69 items that were adopt from patient records and previous studies also recorded as a base-line data. The intervention was arranged totally 6 sessions for physicians and medical students at intervention hospital to ensure them to fulfilment elements of medical records quality components that is; completeness, reliability, accuracy and accessibility on patients' records. The intervention was in the form of workshops, lectures, reminders and official letters, face to face feedback based on prepared protocol. Post intervention and follow-up data on discharge waiting-time and medical record quality components were taken with interval of 5 months. The data analysed by SPSS 19.

Results: Totally 979 questionnaires were accepted from two hospitals. The average of response rate was 96.8 and 94% in intervention and control hospital respectively. Totally 537 (55%) of respondents were female. The length of stay was 1.84 ± 1.81 days, age were 39.21 ± 20.43 years. Wednesday was the busiest day for discharge (19.20%). All medical record quality components and discharge waiting time were normally distributed. The completeness of records had the highest score (3.90 ± 0.35) and

followed by reliability was 3.37 ± 1.05 , accuracy was 2.71 ± 0.87 and accessibility was the lowest score (2.56 ± 0.83) among medical record quality components. Discharge waiting time was 2.74 ± 1.37 . Medical record quality components and discharge waiting time were no significance differences between intervention and control hospital during base line ($P > 0.05$), except for accuracy ($P < 0.001$). After third stages assessment all medical record quality components and discharge waiting time were statistically significance in intervention and control hospital. Analysis of variance of the medical record quality components and discharge waiting time showed that; reliability ($P < 0.001$), accuracy ($P < 0.001$), completeness ($P < 0.001$), accessibility ($P < 0.01$) and discharge waiting time ($P < 0.04$), all variables were statistically significant. The multiple regression analysis revealed completeness and accessibility were associated with discharge waiting time in intervention hospital ($\beta = -0.09$ & $\beta = 0.11$) ($F = 4.54$, $P = 0.001$). The MANCOVA analysis in intervention and control hospital, after adjusting for age, gender, length of stay and ward demonstrated that hospital, time and interaction were significant ($P < 0.001$) with large effect size (0.58 & 0.61) and among adjusted variables gender was significant ($P = 0.01$) with small effect size (0.24)

Conclusion: Medical record needs quality indicators for the improvement of patient medical history. Medical record quality needs continuous assessment in Iranian hospitals and this study's results propose new intervention methods. Completeness for patient records and discharge summary still need improvement and physicians should be involved in this procedure. The study described that discharge waiting time in private teaching hospital is similar to private sector and was less than public hospitals. The study revealed that discharge waiting time could be predicted by two of the medical record quality components; completeness and accessibility. There are a lot of issues in patient discharge delay view point of time, costs and clinic that are recommended for future studies.

Keywords; medical record quality, discharge waiting time, completeness, reliability accessibility,

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

KESAN KUALITI REKOD PERUBATAN KE ATAS MASA MENUNGGU DISCAJ DI HOSPITAL PENGAJARAN SWASTA

Oleh

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Pengenalan: Kualiti dalam rekod pesakit adalah salah satu aspek yang penting dalam kualiti penjagaan kesihatan. Dokumentasi pesakit adalah penting kepada penjagaan pesakit. Dokumentasi yang betul memberi kesan kepada keselamatan dan penjagaan berterusan pesakit. Rekod pesakit yang tidak lengkap adalah antara 22-100% di hospital Iran, dan ini adalah penyebab kepada tempoh tinggal pesakit yang panjang dan juga masa menunggu discaj yang lama. Kualiti rekod perubatan terdiri daripada empat komponen iaitu; kebolehpercayaan yang digunakan untuk kestabilan dan ketekalan data, akses data pesakit yang penting bagi pengurusan risiko dan kos penjagaan kesihatan, ketepatan untuk pengekodan dan akhir sekali ialah kesempurnaan rekod perubatan. Kajian ini bertujuan untuk menentukan kesan kualiti rekod perubatan kepada masa menunggu discaj di hospital yang dikaji.

Metodologi: Satu kajian intervensi dijalankan pada dua hospital pengajaran swasta di Mashhad Iran, di mana pengukuran di ambil pada sebelum, selepas dan susulan intervensi. Hospital yang dipilih dipadankan dari segi wad lelaki dan wanita, dan wad pembedahan dan perubatan dalam. Saiz sampel adalah 146 dan persamaan yang baik di kalangan hospital intervensi dan kawalan (95% selang keyakinan; 0.89- k0.98). Selepas pesakit di discaj oleh doktor ukuran masa menunggu discaj di rekodkan dalam pro-forma mengandungi 7 pekara, dan kualiti rekod perubatan yang terdiri dari 69 pekara berdasarkan rekod perubatan pesakit juga di rekodkan sebagai data awal, Pakar perubatan di hospital intervensi diberikan intervensi untuk memenuhi kesempurnaan, kebolehpercayaan, ketepatan dan akses rekod perubatan. Intervensi yang dijalankan adalah dalam bentuk bengkel, syarahan, peringatan dan surat pekeliling. Data selepas intervensi dan susulan bagi masa menunggu discaj dan kualiti rekod perubatan diambil dalam jangkamasa setiap 6 bulan.

Keputusan: Sejumlah 979 soal selidik telah diterima kedua-dua hospital. Purata kadar respons adalah 96.8% di hospital intervensi dan 94% hospital kawalan. 537 (55%) responden adalah perempuan. Tempoh penginapan adalah 1.84 ± 1.81 hari, umur adalah 39.21 ± 20.43 tahun. Hari Rabu adalah hari yang paling sibuk bagi discaj pesakit

(19.20%). Data bagi komponen kualiti rekod perubatan dan masa menunggu discaj mempunyai distribusi normal. Kesempurnaan rekod mempunyai skor tertinggi (3.90 ± 0.35) dan diikuti oleh kebolehpercayaan adalah 3.37 ± 1.05 , ketepatan adalah 2.71 ± 0.87 dan akses adalah skor yang paling rendah (2.56 ± 0.83). Rekod komponen kualiti perubatan dan masa menunggu discaj didapati tidak ada perbezaan yang signifikan antara hospital intervensi dan kawalan hospital pada data asas ($P > 0.05$), kecuali ketepatan ($P < 0.001$). Selepas peringkat ketiga penilaian semua komponen kualiti rekod perubatan dan masa menunggu discaj menunjukkan hubungan yang signifikan secara statistik antara hospital intervensi dan kawalan. Analisis varians kepada komponen kualiti rekod perubatan dan masa menunggu discaj mendapati; kebolehpercayaan ($P < 0.001$), ketepatan ($P < 0.001$), kesempurnaan ($P < 0.001$), akses ($P < 0.01$) dan masa menunggu discaj ($P < 0.04$), semua pemboleh ubah adalah signifikan secara statistik. Analisis regresi berganda menunjukkan kesempurnaan dan akses dikaitkan dengan masa menunggu discaj di hospital intervensi ($\beta = -0.09$ & $\beta = 0.11$) ($F = 4.54$, $P = 0.001$). Analisis MANCOVA dalam hospital intervensi dan kawalan, selepas pelarasan bagi umur, jantina, LOS dan wad menunjukkan bahawa hospital, masa dan interaksi adalah signifikan ($P < 0.001$) dengan saiz kesan besar (0.58 & 0.61) dan di antara pemboleh ubah diselaraskan jantina adalah signifikan ($P = 0.01$) dengan saiz kesan kecil (0.24).

Kesimpulan: Rekod perubatan memerlukan petunjuk kualiti untuk penambahbaikan sejarah perubatan pesakit. Kualiti rekod perubatan memerlukan perubatan memerlukan pemerkasan berterusan di hospital Iran dan keputusan kajian ini mencadangkan kaedah intervensi baru. Rekod pesakit yang kesesakan dan vingkak pelepasan masih memerlukan peningkatan dan ahli perubatan perlu merlibatkan diri dalam prosedur ini. Kajian membuktikan masa menunggu untuk di hospital pengajaran swasta adalah sama dengan sektor swasta dan kurang daripada hospital kewangan. Kajian ini mendedahkan bahawa pelepasan menunggu masa boleh dijangkakan dengan dua komponen kualiti rekod perubatan; kesempurnaan dan kemudahan. Banyak isu dalam pesakit yang tenangganah dalam pandangan masa, kos dan klinik yang akan dicadangkan pada kajian yang akan datang.

Kata kunci: rekod perubatan, kualiti, pelepasan menunggu masa, kesempurnaan, akses, kebolehpercayaan

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I certify that a Thesis Examination Committee has met on (22/2/2016) to conduct the final examination of Nasser Gommami on his thesis entitled “Impact of medical record quality on discharge waiting time at private teaching hospitals in Mashhad Iran” in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy. The Members of the Thesis Examination Committee were as follows:

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xvi
LIST OF ABBREVIATIONS	xviii
CHAPTER	
1 INTRODUCTION	1
1.1 Background	1
1.2 Problem statement	2
1.3 Significance of study	3
1.4 Research questions	3
1.5 Objectives	4
1.5.1 General objective	4
1.5.2 Specific objectives	4
1.6 Hypothesis	4
2 LITERATURE REVIEW	5
2.1 Theoretical background	5
2.1.1 Intervention in organisation development	5
2.1.2 Models of organisation development	6
2.1.3 Strategies of organisation development intervention	7
2.2 Organisation development in health care quality	9
2.2.1 Quality improvement in health care	10
2.2.2 Plan, do, study, act in health care	11
2.3 Country profile	14
2.4 Hospitals in Iran	17
2.5 Medical record	18
2.5.1 Medical record in Iran	20
2.6 Medical record quality	21
2.7 Medical record quality components	22
2.7.1 Reliability	23
2.7.2 Accuracy	25
2.7.3 Completeness	28
2.7.4 Accessibility	32
2.8 Criteria for medical record quality	34
2.9 A systematic review of medical record quality components	37
2.9.1 Methods of review on medical record quality	38
2.9.2 Study selection of review on medical record quality	38
2.9.3 Consequences of review on medical record quality	39
2.10 Discharge waiting time	41

2.10.1	Quality of discharge waiting time in countries	46
2.11	Conceptual framework	50
3	METHODOLOGY	52
3.1	Study location	52
3.2	Study design	52
3.3	Study duration	52
3.4	Sampling	53
3.4.1	Study population	53
3.4.2	Sampling population	53
3.4.3	Inclusion and exclusion criteria	53
3.4.4	Sampling frame	55
3.4.5	Sampling unit	55
3.4.6	Sample size	55
3.4.7	Random allocation of hospitals	55
3.4.8	Sampling method	55
3.5	Instruments	56
3.5.1	Medical record quality pro-forma	56
3.5.2	Discharge waiting time Pro-forma	56
3.6	Intervention	56
3.7	Study variables	59
3.7.1	Independent variable	59
3.8	Primary dependent variables (medical record quality components)	59
3.8.1	Secondary dependent variable (discharge waiting time)	59
3.9	Study ethics	61
3.10	Quality control	62
3.10.1	Validity of intervention module	62
3.10.2	Reliability and validity of medical record quality	62
3.10.3	Reliability and validity of discharge waiting time pro-forma	63
3.10.4	Pretest study	63
3.11	Data recording and data analysis	64
4	RESULTS	66
4.1	Response rate	66
4.2	Hospitals characteristics	67
4.3	Descriptive statistics	68
4.4	Analytical statistics	73
4.5	Comparison means of medical record quality components and discharge waiting time in intervention and control hospitals	73
4.5.1	Comparison means of medical record quality components and discharge waiting time at baseline between two hospitals	73
4.5.2	Comparison means of medical record quality components and discharge waiting time on week 20 between two hospitals	75
4.5.3	Comparison means of medical record components and discharge waiting time on week 40 between two hospitals	76

4.6	Comparison of the covariate at baseline, week 20 and week 40 between intervention and control hospitals	77
4.6.1	Comparison of the covariate at baseline between intervention and control hospitals	77
4.6.2	Comparison of the covariate in week 20 between intervention and control hospitals	79
4.6.3	Comparison of the covariate in week 40 between intervention and control hospitals	80
4.6.4	Results for compare 3 stages of assessments and hospitals for ward	81
4.7	Comparison of reliability at baseline, week 20, week 40 between and within intervention and control hospital	82
4.8	Comparison mean of accuracy at baseline, week 20 and week 40 between and within intervention and control hospital	84
4.9	Comparison means of completeness at baseline, week 20 and week 40 between and within intervention and control hospital	86
4.10	Comparison means of accessibility at baseline, week 20 and week 40 between and within intervention and control hospital	88
4.11	Comparison of discharge waiting time at baseline, week 20 and week40 between and within intervention and control hospital	90
4.12	To evaluate medical record quality components (completeness, accuracy, accessibility and reliability) as predictor on discharge waiting time	92
4.13	To determine effects of confounders variables for wards, gender, length of stay and age after adjusted on the medical record quality components and discharge waiting time	93
5	DISCUSSION	96
5.1	Major findings	97
5.2	Intervention	98
5.3	Characteristics of samples	98
5.4	Reliability	99
5.5	Accuracy	100
5.6	Completeness	101
5.7	Accessibility	102
5.8	Discharge waiting time	102
6	CONCLUSION	104
6.1	Strength of study	104
6.2	Limitation of study	105
6.3	Recommendation	105
	REFERENCES	107
	APPENDICES	120
	BIODATA OF STUDENT	159
	LIST OF PUBLICATIONS	160

LIST OF TABLES

Table	Page	
2.1	Estimated Number of Health Care Facilities in Iran (2009)	15
2.2	Distributions of hospital beds in Iran (2010)	18
2.3	Methodological comparison of reliability studies.	39
2.4	Methodological comparison of accuracy studies	39
2.5	Methodological comparison of completeness in selected studies	40
2.6	Methodological comparison of availability and completeness of discharge summary in selected studies	41
2.7	Methodological and time comparison of discharge waiting time in selected studies	41
2.8	Time from physician assessment to discharge in emergency department (min)	45
3.1	Medical record quality components	56
3.2	Contents of intervention module on improve medical record	58
3.3	Discharge day in Neurosurgery Ward, Aria Hospital	64
3.4	Statistical analysis based on objectives	65
4.1	Response rate for 3 stage of study in intervention and control hospital	66
4.2	Structural characteristic of intervention and control hospitals	67
4.3	Comparison characteristics of intervention and control hospital	68
4.4	Total number of patients' record among ward	69
4.5	Characteristics of gender in intervention and control hospital in three time of assessment	70
4.6	Chracteristics of respondents for age and length of stay in three time of assessment	70
4.7	Total number of discharged day in three time of assessment	71

4.8	Test of normality for study variables	72
4.9	Characteristics of study variables based on time of assessment	73
4.10	Mean and Standard Deviation of medical record quality components and discharge waiting time at baseline in intervention and control hospitals	74
4.11	Mean and Standard Deviation of medical record quality components and discharge waiting time on week 20 in two hospitals	76
4.12	Mean and Standard Deviation of medical record quality components and discharge waiting time on week 40 in two hospitals	77
4.13	Total number of men ward and women ward patients at baseline in intervention and control hospitals	78
4.14	Total number of men and women patients (gender) at baseline in intervention and control hospitals	78
4.15	Total number of patients in men ward and women ward on week 20 in intervention and control hospitals	79
4.16	Total number of patients' gender on week 20 in intervention and control hospitals	80
4.17	Total number of patients in men ward and women ward on week 40 in intervention and control hospitals	81
4.18	Total number of patients' gender on week 40 in intervention and control hospitals	81
4.19	Chi-square for time of assessment and ward	81
4.20	Chi-square test for hospital and ward	82
4.21	Analysis of variance for mean of reliability	82
4.22	Comparison reliability at baseline, week 20 and week 40 in intervention and control hospitals	83
4.23	Comparison reliability between intervention and control hospitals at baseline, week 20 and week 40	83
4.24	Analysis of variance for mean of accuracy	84
4.25	Comparison accuracy at baseline, week 20 and week 40 in intervention and control hospitals	85
4.26	Comparison accuracy between intervention and control hospitals at	85

	baseline, week 20 and week 40	
4.27	Analysis of variance for means of completeness	86
4.28	Comparison completeness at baseline, week 20 and week 40 in intervention and control hospital	87
4.29	Comparison completeness between intervention and control hospitals at baseline, week 20 and week 40	87
4.30	Analysis of variance for mean of accessibility	88
4.31	Comparison accessibility at baseline, week 20 and week 40 in intervention and control hospitals	89
4.32	Comparison accessibility between intervention and control hospitals at baseline, week 20 and week 40	89
4.33	Analysis of variance for mean of discharge waiting time	90
4.34	Comparison DWT at baseline, week 20 and week 40 in intervention and control hospital	91
4.35	Comparison DWT between intervention and control hospital at baseline, week 20 and week 40	91
4.36	Multiple regression analysis for discharge waiting time and MRQ predictor in Intervention hospital	92
4.37	MANCOVA analysis in intervention and control hospital at three time of assessment	94
4.38	Univariate effects for time of assesments and hospitals on MRQ components and discharge waiting time	95

LIST OF FIGURES

Figure	Page	
2.1	Systems model of action-research process	7
2.2	Organisation development and change approach	8
2.3	PDSA method in quality improvement intervention	13
2.4	Healthcare system in Iran	15
2.5	Reliability of patient records in selected countries	25
2.6	Accuracy of data in different countries	27
2.7	Average of completeness of patients' records among selected countries	28
2.8	Completeness of patient records and number of items surveyed in selected countries	31
2.9	Availability and completeness of discharge summaries in selected studies	34
2.10	Frequency of records used in medical record assessment since 2010 in selected studies	36
2.11	Discharge waiting time in different countries (minutes)	48
2.12	Discharge process in Iranian hospitals	49
2.13	Conceptual Framework impact of medical record quality on discharge waiting time	51
3.1	Diagrammatic illustration of research flow	54
4.1	Comparing patients' record among selected wards in three stages of study	68
4.2	Discharge day at three stages of study in two hospitals	71
4.3	Reliability score at three time of assessment in intervention and control hospital	84
4.4	Accuracy score at three time of assessment in intervention and control hospital	86

4.5	Completeness score at three time of assessment in intervention and control hospital	88
4.6	Accessibility score at three time of assessment in intervention and control hospital	90
4.7	Discharge waiting time at three time of assessment in intervention and control hospital	92



LIST OF ABBREVIATIONS

DHC	District Health Centers
DWT	Discharge waiting time
EMR	Electronic Medical Record
EMRO	East Mediterranean Regional Organization
IAU	Islamic Azad University
LOS	Length of Stay
MOH&ME	Ministry of Health and Medical Education
MRQ	Medical record quality
MSHDIAU	Islamic Azad University Mashhad Branch
SCI	Statistical Centre of Iran
UMSHS	University of Medical Science and Health Services
USD	United States Dollars
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

Patient documentation is central to patient care (Mandeville, 2008). Patient record documentation is one of the critical aspects of healthcare quality and hospital management. Quality of medical records helps in sharing valuable information for the continuance of patient care, decrease of medical errors and compliance to legal and medical requirements, as well as the preparation of suitable information for policy making and decision making (Minvielle et al., 2010).

Despite the long-standing use of medical records in hospitals, the quality has a number of problems in their use. Worldwide medical record issues include incomplete and inaccurate patient identification, low availability and accessibility of the records, low quality and quantity of accuracy in data entry and low levels of attention from physicians and hospital management on the medical record (WHO, 2006). Physicians are primarily responsible to complete the medical records, followed by nurses, secretaries and other healthcare professionals who also play a role. Completeness of records is an important part of patient care. Incomplete medical records in several studies in Iran varied from 22 to 100% based on records, wards and personnel in charge in Iranian hospitals (Karbasi H. Ziai, 2006; Faramarz Pourasghar et al., 2008; Setareh, Bagherian, Mahmoodabadi, Amini, Rafati, 2010; Somi, Piri, 2004). Most studies in the field of medical record quality have focused on completeness. However, many of the research methods up to now were descriptive in Iran hospitals.

The studies were reported incomplete and unreliable medical records between 31.3% and 40%. (Setareh, Bagherian, Mahmoodabadi, Amini, Rafati, 2010; Somi, Piri, 2004). The study of Ajami (2007) into the application of the medical record in research revealed that 37.5% of researchers were reluctant to use medical records due to incomplete and inaccessible information. There is also inaccuracy in the coding of diseases based on ICD10 in Iranian hospitals. Farzandipour reported that 22.7% of coding in the medical record is incorrect (Farzandipour, Sheikhtaheri, & Sadoughi, 2010). Another study on mechanism of statistical information production in all hospitals affiliated to Tehran Medical Science University revealed that 57% of requested information was registered in admission record, which was most on demographic information and conducted to low retrieving data from medical records. Most of the medical record studies in Iran limited to qualitative analysis of records and fewer go through providers' point of view (Faramarz Pourasghar et al., 2008). The other important components of the medical record, such as reliability and accessibility, have been studied few in Iran hospitals.

The patients' records have been known as source of data for decision making, especially in emergency situations but the physicians believed that patients record were not accessible on time. The studies in Iran described that quality of documentation

could be affected by illegibility, missing records, physician workload and insufficient quality control on medical records (Faramarz Poursaghar et al., 2008; Somi, Piri, 2004).

1.2 Problem statement

Proper documentation of patient record is identifying critical aspects of quality in healthcare. Inaccessible and inaccurate patient record conducted to wrong or mistiming treatment and effects on patient satisfaction and patient stability. It also raises patient and hospital costs. The researchers are not interested using patients' records because of inaccessible and incomplete information (Attena et al., 2010). This trend causes gap between what healthcare face and what healthcare performed in Iran. Because of incomplete records insurance company deducted hospital funds and face the hospitals with more restriction of resources. The inaccurate data in patients' records also resulted to miss measurement of disease prevalence and low accuracy in Iran hospitals (Farzandipour et al., 2010). Unreliable records leads to failure in effective treatment and patient safety. The Iranian hospitals need more studies on reliable data and improve patient record reliability (Somi, Piri, 2004). The studies in western countries reported completeness of over 85% in patient records, whereas studies in Iran revealed completeness levels of 65% or less and low accessibility to discharge summary for continuing of treatment (Hoseinpoufard, Abbasi Dezfouli, Ayoubian, Izadi, & Mahjob, 2012; Faramarz Poursaghar et al., 2008; Setareh, Bagherian, Mahmoodabadi, Amini, Rafati, 2010; Somi, Piri, 2004), as well as an increase to patients' length of stays and discharge waiting time (DWT) in hospitals (Hoseinpoufard et al., 2012; Metz, Son, Winter, & Chae, 2011; F Poursaghar, Malekafzali, Kazemi, Ellenius, & Fors, 2008; Wagner & Hogan, 1996).

DWT could affect patient satisfaction and hospitals' costs. Early DWT causes a reduction in nursing and physician workloads, increases patient admission and saves costs in hospitals. DWT is a costly process for hospitals, and the annual cost of DWT for a 30 bed ward is estimated at over USD 971,544 (Hendy, JH Patel, Kordbacheh, 2012). Iranian hospitals have long DWT which cause patient dissatisfaction, discharge delays and can be considered as a quality failure. (Ajami & Ketabi, 2007; Aliramaei, Kan'ani, Afrasiabian, stifaie, Naseri, Ghasrsaz, 2013; Ameryoun, Pourtaghi, Bahadori, Ebrahimi, 2013; Kebriaei, Kazemi, & Khosravi, 2010; Samadbyk, 2001). Reduce DWT increase bed turnover, decrease physician and nurse workload and save funds for hospitals (Khanna, Boyle, Good, & Lind, 2012).

Quality of patient records could be improved through proper intervention (Attena et al., 2010). Although extensive research has been carried out on the medical records quality, no single study exists which adequately covers the various items in patients' records for completeness and the implementation of an intervention. There is also unknown knowledge about the effects of medical record components on DWT. There is a gap that intervention in one department in the hospital could be affected on other part of hospital.

1.3 Significance of study

The study was conducted to improve medical record quality through proper intervention in Iranian hospitals. There were no studies on quality improvement on medical record quality components (reliability, accuracy, completeness and accessibility). Iranian hospitals need to know the areas of strength and weakness in the medical records kept and prepare an intervention for quality improvement and this study prepared proper environment. The quality improvement procedure is important for hospital before accreditation. The study was essential for hospital management to know the effects of intervention on MRQ components and as predictor on DWT. Although the study not only intended to improve MRQ components but also reduced DWT resulting into saves for the hospital.

The private teaching hospitals established the recent years since the private medical education developed in Iran. There is not any study that focussing on private teaching hospitals, it is essential to know the trends of hospital management in private teaching hospitals because there are less funds compared to public hospitals. On the other hand quality of medical education is critical for approving the teaching hospital by ministry of health and medical education (MOH&ME).

The study could be generated as new methods of intervention in Iranian hospitals. The results could be used for MOH&ME in field of hospital management and improve paper-based medical records towards electronic medical record versions.

1.4 Research questions

In this study, the researcher is going to answer the following questions:

1. What is the current situation of the medical records' quality components (completeness, accuracy, accessibility and reliability) and discharge waiting time regarding intervention and control hospitals?
2. What is the impact of medical record quality intervention on medical record quality components?
3. What is the effect of medical records' quality components (completeness, accessibility, accuracy and reliability) on discharge waiting time in hospitals?
4. What are the effects of patient age, length of stay, ward and gender on the medical records quality components (completeness, accessibility, accuracy and reliability) and discharge waiting time?

1.5 Objectives

1.5.1 General objective

In this study the general objective was to develop, implement and evaluate the medical record quality intervention on quality of medical record and discharge waiting time in private teaching hospital in Mashhad - Iran.

1.5.2 Specific objectives

The specific objectives for this study are as follows:

- 1.5.2.1 To identify the situation of medical records quality components and discharge waiting time at baseline, week 20 and week 40 of the study.**
- 1.5.2.2 To develop and implement a medical record quality intervention module to improve medical record quality components (reliability, accuracy, completeness and accessibility).**
- 1.5.2.3 To evaluate the impact of medical record quality module on medical record quality components (reliability, accuracy, completeness and accessibility) between and within intervention and control hospitals.**
- 1.5.2.4 To evaluate the impact of medical record quality module on discharge waiting time between and within intervention and control hospitals.**
- 1.5.2.5 To evaluate medical record quality components (reliability, accuracy, completeness and accessibility) as predictors on discharge waiting time.**

1.6 Hypothesis

- 1- There is a significant mean difference on medical record quality components (completeness, accuracy, accessibility and reliability) before and after intervention, between and within hospitals.
- 2- There is a significant mean difference of discharge waiting time after intervention between and within intervention and control hospitals.

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LIST OF PUBLICATIONS

A systematic review of quality components of patient's medical record in Iranian hospital, *International Journal of Public Health and Clinical Sciences* ISSN: 2289-7757. Vol. 2:No. 2 March/April 2015.

Preliminary Finding of Evaluation on patients' Medical Records in Private Teaching Hospitals, Iran, health economic conference, *Seminar on Health Economics for Health Care Professionals 2014*, Seminar 23rd to 25th June 2014 Malaysia , Bangi, poster presentation.

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