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RESEARCH ARTICLE

The Quality of Medical Consultations in a Teaching Hospital: A Cross-Sectional Study

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ABSTRACT

Background and objectives: Medical consultations became undeniable elements for the quality of health care and training of medical residence. This study aimed to assess the quality of performed consultations.

Methods: This retrospective cross-sectional study at Shohadaye Tajrish hospital, affiliated to Shahid Beheshti University of Medical Sciences, in Tehran, Iran between 20th April 2018 and 4th May 2019. The reported items and quality score of medical consultation requests and responses between emergency and non-emergency consultations and between the faculty members and medical residents were assessed by SPSS version 21.0.

Results: Among 431 medical consultations, most were non-emergency, requested by residents, and responded to by faculty members. The quality of consultations requested ($p < 0.001$) or responded ($p < 0.001$) by faculty members was higher than by medical residents. Higher year residents performed higher quality consultation requests ($p = 0.008$) and responses ($p < 0.001$). The quality score of consultation requests ($p = 0.51$) and responses ($p = 0.1$) had no significant difference between types of consultation.

Conclusion: Underreported items of consultation impressed its quality. Faculty members and higher-year residents performed higher quality consultations.

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INTRODUCTION

Nowadays, various number of patients admitted to the hospitals with medically complex issues and addressed by interprofessional teams to get the greatest medical management. According to the sensitivity of medical subjects, achieving the appropriate and accurate diagnostic and therapeutic decisions mostly need more than one discipline to address issues regarding their health status. In this respect, health care providers, especially the physicians need to enhance the communication skills [1-5]. There is a consensus in the health settings that written communication has priority than face to face communication and medical Consultation Letters (CLs) pave this way. Medical CLs enable the physicians for timely information exchange. Medical consultation became an undeniable element to enhance the quality of health care, which allows sharing of expertise and perspectives between physicians [2,6,7]. In this regard, the American Medical Association laid down the

ethical principles, roles and commandments for performing the effective medical CLs [8].

Medical CLs include various information related to the patients, different findings and the diagnosis. However, most of the physicians are concerned and dissatisfied with the content of filled out CLs. Lack of the reason in the consultation request, Past Medical History (PMH), clinical and laboratory findings and the diagnosis in the consultations content are some of the major concerns in this part [1,3,4]. Studies showed that 14% to 24% of medical CLs had no specific reason for the requests thus brought no responses [9,10]. A study in Saudi Arabia showed that faculties had higher number of reporting diagnosis and lower number of reporting the laboratory findings than residents [1].

Evaluating the quality of consultations is of paramount importance. Studies showed that low quality of consultation requests and subsequently consultation responses and nonspecific consultations may occur due to physicians' lack of knowledge on the diseases and inappropriate consultation requests. This can make various problems including increase the risk of repetition and unnecessary diagnostic procedures, delay to achieve the best diagnosis and subsequently delay to begin the treatments, increase the risk of medical mismanagements, excess treatment costs and finally affect the public trust in health care [1,11,12]. Too little or too much consultations could also impress the quality of health care. Studies declared that most of consultation responses had low quality due to the low quality of consultation requests [3,13].

Consultation request is an underlying and important method that has a great impact on the responders' attitude. Otherwise, the consultation response is of great value on the training of medical residence which is unfortunately forgotten [14,15]. To achieve the health care goals, consultation request and response must be of high quality. Studies showed that most of the physicians were not well trained in requesting the consultation thus led inappropriate consultation responses. In this regard, the qualified form for medical consultations was provided to identify an important information easily and make the requester and respondent to obey its rules [1,2]. In addition, training the interprofessional collaboration especially the medical residents can help enhancing the communication skill to make the best decisions. Therefore, training the consultation request and respond and evaluating the consultation's quality should be the part of the medical study. Improving the quality of consultations is expected by increasing the years of training [1,2]. In this regard, studies showed significant improvements in the quality of CLs after training [3,14].

Given the limited number of studies comparing the quality of medical CLs in Iranian health care providers, the goal of this study was to evaluate the timing and quality of

medical consultation requests and responses and possible associated factors at a specialized teaching hospital.

MATERIALS AND METHODS

Study design

This study was a retrospective cross-sectional study conducted at Shohadaye Tajrish hospital, referral center of north of Tehran, affiliated to Shahid Beheshti University of Medical Sciences, in Tehran, Iran between 20th April 2018 and 4th May 2019. The Ethics Committee of Shahid Beheshti University of Medical Sciences approved the executive protocol of the study (Ethic Code: IR.SBMU.RETECH.REC.1399.436). The study was conducted in accordance with the Declaration of Helsinki (Seventh revision 2013). This study did not impose any additional costs on the patients or on the health system.

Participants

All medical consultations of patients with at least 24 hours hospitalization, regardless of the requested admitting services, patients' doctor and time of discharge were included in this study. The medical consultations of patients with less than 24 hours hospitalization was excluded.

Data gathering

The researchers were filled out the pre-prepared checklist for evaluation of consultation letters. The consultation request included age, gender, registration number, admitting service, inpatient ward, bed number of patient, time and date of request, types of consultation (Emergency and non-emergency), signature of requester and the items related to the quality of consultation.

The consultation response included age and gender of patients, time and date of response, signature of respondent and the items related to the quality of consultation. There was additional information in the checklist including the frequency of consultation requested during working time (Working time defines as the period of time that person spend at work between 8 am and 2 pm from Saturday to Thursday), accomplished consultations for each patient, duration between consultation request and response, consultation request in each admitting service and each inpatient ward.

After excluding the patients' and doctors' personal information, the CLs were encoded with English letters and then assigned to the researcher in order to evaluate the quality of consultations. The quality of consultation request was evaluated quantitatively based on six items including PMH, important physical examination findings, important laboratory and radiologic findings, Drug History (DH), probable diagnosis and brief and clear purpose of the consultation request. The quality of consultation response

was evaluated quantitatively based on six items including PMH, important physical examination findings, important laboratory and radiologic findings, result of consult and probable diagnosis, proposed diagnostic and therapeutic plans, required revisit and the time interval. The score of each item was zero (Absent of the item) or one (Present of the item) and the sum of all items shows the total score in the range of zero to six. Higher scores indicated more reported items and subsequently better quality of consultations.

Finally, the aforementioned data and mean of total score of consultation request and response were compared between the faculty members and medical residents (First to forth year residents) and were also compared between the types of consultation.

Statistical analysis

All data were analyzed with SPSS version 21.0 (SPSS Inc., Chicago, IL., USA). The Kolmogorov-Smirnov test was used to assess the normality distribution of variables. Categorical variables were described using frequency (Percentage) of the data. Continuous variables were described using mean $\pm$ standard deviation (SD), median and interquartile range of the data. An independent sample t-test, one way ANOVA test and Mann-Whitney test were applied to compare continuous variables between different types of consultation or between faculty members and all medical residents in the normal and non-normal distribution. The post hoc multiple was performed to compare the group means. The association between categorical variables was assessed using Chi-Square test or Fisher's Exact test. $p < 0.05$ was considered statistically significant.

RESULTS

Four hundred thirty-one medical consultation requests equal to consultation responses were enrolled in the present study which were for 85 patients in different admitting services. The accomplished consultations had wide range for each patient. The frequency of consultation requests based on admitting services were as follows: General Surgery (122), Neurology (60), Urology (53), General Internal Medicine (52), Neurosurgery (35), Nephrology (22), Infectious Disease (17), Dermatology (15), Oncology (13), unknown service (11), Emergency Medical (7), Orthopedic (6), Rheumatology (5), Pediatric (4), Radiology (3), Anesthesiology (2), Gastroenterology (2), Cardiology (1) and Intensive Care Unit (1). There was no consultation request by Obstetrics and Gynecology, Endocrinology, Pulmonary and Radiotherapy services.

Baseline information between the types of consultation is shown in table 1. Most of the consultations were non-emergency, requested during working time, requested by residents (Especially first year ones) and responded by faculty members. The frequency of non-emergency consultations was significantly higher than emergency ones

($p < 0.05$). The frequency of consultation request during working time, mean number of accomplished consultations for each patient and mean number of consultation requests in each admitting service or each inpatient ward had no significant difference between the types of consultations ($p > 0.05$). Only in 211(49%) consultations, the time was reported in both requests and responses. The mean duration between consultation request and response had no significant difference between types of consultation (Table 1).

The emergency consultation requests had significantly more reported items of date, time and signature of requester than non-emergency ones ($p < 0.05$). In that respect, the reported items of admitting service had approaching borderline statistical significance difference between types of consultation ($p = 0.05$). However, the emergency consultation requests had more reported items of gender, inpatient ward, bed number and less reported items of age and registration number than non-emergency ones and the difference was not statistically significant ($p > 0.05$). The emergency consultation responses had more reported items of gender and time and less reported items of age, date of response and signature of the respondent, than non-emergency consultations but the significant difference was only observed between the frequency of reported signature of the respondent and types of consultation ($p < 0.05$) (Table 2).

Table 3 shows the reported items of the quality of consultation requests and responses by different types of consultation. The majority of consultation requests had brief and clear purpose and probable diagnosis. PMH was reported in half of them. However, most of the consultation requests had no important physical examination findings, important laboratory findings or DH. The reported items in the consultation requests had no significant difference between the types of consultations ($p > 0.05$). Most of the consultation responses were reported the PMH, important physical examination findings, important laboratory and radiologic findings and proposed diagnostic and therapeutic plans. The probable diagnosis and required revisit and the time interval were not reported in most of the consultation responses. The reported items in the consultation responses had no significant difference between the types of consultations ($p > 0.05$), except to the important laboratory and radiologic findings, which was reported significantly more in the emergency ones ($p < 0.05$).

The percentage of reported date, time and probable diagnosis of consultations responded by all medical residents were significantly higher than those responded by faculty members ($p < 0.05$). The percentage of reported age, PMH and important laboratory and radiologic findings of consultations responded by faculty members were significantly higher than those responded by all medical

Table 1: Baseline data between the types of consultation.

Variables		Total	Types of consultation		p-value*
			Emergency	Non-emergency	
Total number of Consultations		431	166(38.5)	265(61.5)	0.001
Consultation request during working time, NO (%)		319(74)	132(84)	187(84.6)	0.94
Accomplished consultations for each patient, NO	mean $\pm$ SD	5.6 $\pm$ 70.1	2.3 $\pm$ 96.1	3.3 $\pm$ 53.9	0.28
	Range	1-40	1-16	1-24	
Duration between consultation request and response, hour	mean $\pm$ SD	3.48 $\pm$ 3.5	3.27 $\pm$ 3	3.65 $\pm$ 3.8	0.76
	median (IQR)	3.00 (3.77)	2.83(3.50)	3.03(3.58)	
	Range	0-22.8	0-18	0-23	
Consultation requests in each admitting service, NO	mean $\pm$ SD	23.3 $\pm$ 31.4	12.7 $\pm$ 16.9	15.9 $\pm$ 16.6	0.32
	Range	1-122	1-59	1-63	
Consultation requests in each inpatient ward, NO	mean $\pm$ SD	24.6 $\pm$ 23.9	13.4 $\pm$ 11.2	14.8 $\pm$ 14.2	0.879
	Range	1-86	1-34	1-57	
Consultation request, NO(%)	Faculty members	27(6.3)	3(1.8)	24(9.1)	0.003
	All medical residents	403(93.5)	162(97.6)	241(90.9)	
	First year residents	294(68.2)	116(69.9)	178(67.2)	0.445
	Second year residents	92(21.3)	41(24.7)	51(19.2)	
	Third- and fourth year residents	17(3.9)	5(3)	12(4.5)	
Consultation response, NO(%)	Faculty members	269(62.4)	107(64.5)	162(61.1)	0.085
	All medical residents	73(16.9)	21(12.7)	52(19.6)	
	First year residents	63(14.6)	15(9)	48(18.1)	0.041*
	Second year residents	9(2.1)	5(3)	4(1.5)	
	Third- and fourth year residents	1(0.2)	1(0.6)	0	

SD: Standard Deviation; NO: Number; IQR: Interquartile Range. *p-value refers to the relationship of each variable between different types of consultation. *p-value refers to the relation between variables based-on Fisher's exact test.

Table 2: Reported items in the consultation letters based on the types of consultation.

Variables		Total (n = 431)	Types of consultation		p-value*
			Emergency (n = 166)	Non-emergency (n = 265)	
Reported consultation request items, NO(%)	Gender	414(96.1)	160(96.4)	254(95.8)	0.78
	Age	356(82.6)	134(80.7)	222(83.8)	0.42
	Registration number	408(94.7)	156(94)	252(95.1)	0.61
	Date of request	424(98.4)	166(100)	258(97.4)	0.04
	Time of request	378(87.7)	157(94.6)	221(83.4)	0.001
	Admitting service	420(97.4)	165(99.4)	255(96.2)	0.05
	Inpatient ward	369(85.6)	147(88.6)	222(83.8)	0.17
	Bed number	283(65.7)	114(68.7)	169(63.8)	0.29
Reported consultation response items, NO(%)	Signature of requester	411(95.4)	163(98.2)	248(93.6)	0.04
	Gender	362(84)	140(84.3)	222(83.8)	0.87
	Age	328(76.1)	128(77.1)	210(79.2)	0.85
	Date of response	293(68)	113(68.1)	180(67.9)	0.97
	Time of response	241(55.9)	99(59.6)	142(53.6)	0.21
	Signature of respondent ^a	251(58.2)	82(49.4)	169(63.8)	0.003

NO: Number; NA: Not Applicable. *p-value refers to the relationship of each reported items of consultations between different types of consultation.

residents ($p < 0.05$). In that respect, the required revisit and the time interval reported in consultation responses had approaching borderline statistical significance difference between the faculty members and all medical residents ($p = 0.060$). The percentage of responded reported gender, important physical examination findings and proposed diagnostic and therapeutic plans of consultations had no significant difference between the faculty members and all medical residents ($p > 0.05$) (Table 4).

The mean quality score of consultations requested by faculty members was significantly higher than by all medical

residents ($p < 0.05$). In this respect, the mean quality score of consultations requested by first, second, third and fourth medical residents were 2.86 ± 1.11 , 3.2 ± 1.12 , 3.5 ± 1.23 and 4 ± 1 , respectively and the difference was statistically significant ($p = 0.008$). The Post hoc test showed that the significant difference was only observed between first and second year residents ($p = 0.013$) and first and third year residents ($p = 0.038$). The mean quality score of consultation requests in non-emergency types was higher than emergency types, but the difference was not statistically significant ($p > 0.05$).

The mean quality score of consultations responded by

Table 3: Reported items of the quality of consultations requests and responses between the types of consultations.

Reported items	Total (n = 431)	Types of consultation		p-value*
		Emergency (n = 166)	Non-emergency (n = 265)	
Consultation request, NO(%)	PMH	237(55)	90(54.2)	0.76
	Important physical examination findings	200(46.4)	85(51.2)	0.12
	Important laboratory and radiologic findings	138(32)	59(35.5)	0.22
	DH	59(13.7)	19(11.4)	0.23
	Probable diagnosis	300(69.6)	116(69.9)	0.97
	Brief and clear purpose of the consultation request	391(90.7)	148(89.2)	0.31
Consultation response, NO(%)	PMH	295(68.4)	116(69.9)	0.70
	Important physical examination findings	281(65.2)	108(65.1)	0.86
	Important laboratory and radiologic findings	285(66.1)	120(72.3)	0.04
	Probable diagnosis	182(42.2)	70(42.2)	0.94
	Proposed diagnostic and therapeutic plans	385(89.3)	151(91)	0.18
	Required revisit and the time interval	161(37.4)	69(41.6)	0.15

PMH: Past medical history; DH: Drug history. *p-value refers to the relationship between the consultation requests or responses and different types of consultation.

Table 4: Reported items of consultation responses between faculty member and all medical residents.

Reported items of consultation response	Faculty members (n = 269)	All medical residents (n = 73)	p-value*
Date	189(70.3)	62(84.9)	0.012
Time	151(56.1)	56(76.7)	0.001
Gender	222(82.5)	61(83.6)	0.836
Age	218(81)	32(43.8)	<0.001
PMH	195(72.5)	25(34.2)	<0.001
Important physical examination findings	168(62.5)	38(52.1)	0.127
Important laboratory and radiologic findings	206(76.6)	19(26)	<0.001
Probable diagnosis	109(40.5)	43(58.9)	0.004
Proposed diagnostic and therapeutic plans	239(88.8)	69(94.5)	0.086
Required revisit and the time interval	102(37.9)	19(26)	0.060

PMH: Past medical history. *p-value refers to the relationship between each variable of consultation response between faculty members and all medical residents.

Table 5: Quality of consultations between different types of consultation or faculty members and medical residents.

Variables		Quality score of consultations request		p-value*
		mean ± SD	median(IQR)	
Types of consultation	Total (n = 430)	3.06 ± 1.18	3(2)	0.51
	Emergency (n = 166)	3.11 ± 1.19	3(2)	
	Non-emergency (n = 264)	3.03 ± 1.18	3(2)	
Total (n = 429)		3.06 ± 1.18	2(3)	<0.001
Faculty members (n = 27)		4.37 ± 1.18	5(1)	
All medical residents (n = 402)		2.97 ± 1.13	3(2)	
Variables		Quality score of consultations response		p-value**
		mean ± SD	median(IQR)	
Types of consultation	Total (n = 424)	3.75 ± 1.33	4(2)	0.1
	Emergency (n = 163)	3.88 ± 1.38	4(2)	
	Non-emergency (n = 261)	3.67 ± 1.30	4(2)	
Total (n = 340)		3.64 ± 1.30	4(2)	<0.001
Faculty members (n = 268)		3.81 ± 1.29	4(2)	
All medical residents (n = 73)		3.01 ± 1.17	3(2)	

SD: Standard Deviation; IQR: Interquartile Range. *p-value refers to the relationship between mean quality score of consultation requests and each variable. **p-value refers to the relationship between quality score of consultation responses and each variable.

faculty members was significantly higher than by all medical residents ($p < 0.05$). In this respect, the mean quality score of consultations responded by first and second medical residents were 2.89 ± 1.17 and 3.88 ± 0.84 , respectively and

the difference was statistically significant ($p < 0.001$). The mean quality score of consultation responses in emergency types was higher than non-emergency types, but the difference was not statistically significant ($p > 0.05$) (Table 5).

DISCUSSION

This was the first study in Iran that compared the timing and quality of consultation requests and response in two different terms. Majority of consultations were requested by residents (Especially first year ones) and responded by faculty members. The quality of consultation responses was higher than consultation requests. There was various items underreported in the consultations. As a strength, our study compared the quality of consultations between faculty members and residents and among residents of different years. The quality score of consultations (Both request and response) performed by faculty members was significantly higher compared to medical residents. Furthermore, the lowest quality score of consultation (Both requests and responses) was performed by the first year residents which increased by increasing the year of residency.

Good communication between the physicians is mandatory to enhance exchanging the accurate information and medical experience about the specific case. The CLs facilitate the medical communications between the health care providers to reduce the diagnostic errors and delays in finding the best solutions and helps for the benefit of patient care [16–18]. The CL includes several components for reporting the essential information such as the statement of current problem, DH and reason for the request and specialists' assessment of patients, results of the tests and proposed treatment in the consultation responses [6,11,19,20]. High quality consultation enhances the quality of health care and in the meantime, it can introduce the medical students how to manage the complex cases from many different aspects. On the other hand, drawback of reporting items is one of the most important issues leads to reduce the quality of request, response and the quality of health care [11,20–23]. Different studies showed that the quality of consultations were mostly low. Moreover, low quality of consultation requests could be the cause of less frequent and low quality of consultation responses [6,11,18,20,24,25].

In this regard, Gandhi, et al. found that more than half of the physicians were dissatisfied about the quality of consultations, which was related to the low quality of the content. Overall, 23% of consultations had inadequate information about the patients' problem [11]. Ramanayake stated that most of the specialists were dissatisfied about the low quality of consultations which impacts on the improvements of the health care quality [18]. Grol, et al. showed that the patients' pertinent information, diagnosis and treatment were reported less frequent in the CLs [24]. Wong, et al. investigated the quality of consultation responses from rheumatologists during 2000 to 2013. They showed that most of the items such as PMH, symptoms duration, DH, laboratory and imaging findings, were reported in half of the CLs. They declared that low quality of consultations was due to the lack of necessary items in the letters and delay of returning the consultation responses to the primary

care physicians [16]. The frequent underreported items was consistent with ours. These studies mostly compared the quality of referral letters and consultation response between faculty members and general practitioners but our study compared the quality of consultation requests and responses between faculty members and medical residents. Therefore, different frequency of underreported items could be justified by different types of CL and different requesters.

Although low quality of consultations relates to the lack of reported items, identification the possible associated factors can help to enhance the quality of consultations [24]. The types of consultation, workload and duration between the request and response can play important roles in this field. The repetition of consultations can decrease the quality of consultations. As well as, the repetition itself might be the result of low quality of consultations [11]. On the other hand, Toleman J and Barras M showed that at least one third of information from the interview of patients during visits was omitted in the referral letters. Therefore, the consultation respondents should also be aware of underreporting and inaccurate information in the referral letters [26]. Similarly in our study, the number of consultations was high and the quality of consultations and the duration between consultation request and response had no significant difference between emergency and non-emergency ones, which could be more dangerous for emergency types.

In our study, majority of consultations were non-emergency and requested during working time, which brings longer time to spend for training the consultations' writing. Our study highlights the higher quality of consultations performed by the faculty members or higher year residents compared to first year residents, which encourages the importance of training medical students. In addition, low quality of consultations was also related to low number of consultations requested by the faculty members and higher year residents compared to first year residents. In other words, one of the most important reason for the low quality of consultation requests in our study was the high proportion of consultations, requested by first year residents compared to faculty members and higher year residents. Therefore, it is highly recommended to include the permanent medical consultation training in the medical student curriculum. Training the medical communications' writing helps to enhance the quality of consultations [18].

This was a cross-sectional study and the results may not generally be applicable to all medical consultations of the hospital. The quality of consultations was not assessed in different disciplines. Only one the third or fourth year resident responded the consultation requests thus led to evaluate the mean quality of consultation responses between first and second year residents. It is highly recommended to perform an interventional study with larger sample size at multi-center in order to assess the quality of consultations before and after training. In addition, assessing the importance of each item of quality included in CLs can help to

enhance the quality of consultations. As Tobin, et al. showed that performing different interventions including electronic referrals, templates, peer feedback and mixed interventions can help to reach moderate improvements on the quality of referral letters [27,28], it is highly recommended to use pre-prepared forms with essential subheadings under supervision of faculty members for better training of writing consultations in the further studies.

CONCLUSION

Summarily, various different items in the consultation requests were underreported thus led to decrease quality of consultations response. In addition, the quality of consultation (Both requests and responses) were significantly higher in faculty members than medical residents and the quality of consultations in higher year residents was significantly higher than first year residents. Furthermore, low quality of consultations calls for greater emphasizes on the importance of enhanced physicians and patients' knowledge in these areas.

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