

Defensive Medicine: Ethical or Unethical? A Case Study of Tehran University of Medical Sciences Hospitals

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Abstract

Background and Aim: Defensive medicine is a potential, and social problem that might negatively affect the quality of care and waste the limited resources in the health care system. Therefore, this study aimed to determine the occurrence and reasons of defensive medicine in hospitals of Tehran University of Medical Sciences in 2015-2016.

Method: This descriptive and analytical study was conducted among 240 physicians selected by Morgan, Krejcie table and the data were collected through a researcher-made questionnaire. The collected data were analyzed in SPSS version 20 in terms of descriptive results, including percentage, frequency and average, as well as analytical statistical measures, including Chi-square and T tests.

Findings: Half of the physicians used positive or negative defensive medicine. There was no significant correlation between physicians of private and public hospitals regarding the occurrence of defensive medicine behaviors. However, there was a significant relationship between the physicians age and using defensive medicine ($P = 0.049$). Compliance with clinical standards and professional ethics was the priority of physicians who used defensive medicine.

Conclusion: Employing defensive medicine is almost a common practice among studied physicians. It is, therefore, recommended that physicians mitigate their unnecessary concerns of legal consequences of medical errors by observing clinical standards and ethical considerations, and improving awareness of legal aspects of this profession, as other countries with similar traditions and cultural values.

Keywords: Defensive medicine, Physicians, Tehran University of Medical Sciences

Introduction

Defensive medicine refers to any medical examination or treatment prescribed primarily to protect the physician against charges of negligence or complaints made under the title of medical errors [1,2].

Positive defensive medicine includes unnecessary prescriptions, referring the patient to other specialists, requesting extra details from the patients, emphasizing timely visits, and providing additional explanations about how to take the prescribed medicines. Negative defensive medicine includes refraining from prescribing risky medical treatments while such treatments might be to the benefit of the patient, and avoiding treatment of risky patients [1-4].

Defensive medicine is a potential social problem and affect the physician-patient relationship [1-6]. In the USA, majority of physicians use defensive medicine, as an appropriate strategy to protect their profession and reputation against litigation. Although, some believe that defensive medicine almost includes unnecessary and costly methods that are not the best option for the patient [7-10].

Occurrence of defensive medicine, whether positive or negative, can be reduced if health care providers are less sued and thus, are not forced to document, verify their medical decisions and put more effort in implementation of medical care standards to avoid medical negligence [11-13]. In addition, they create psychological and social problems, such as anxiety, anger, scandal, losing work time, and criminal records for the physician. This causes physicians to employ a strategy called defensive medicine [14,15].

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In recent years, there has been a significant increase in the number of complaints against physicians. As a result, much money and energy is spent on litigation and other side effects like increased health care costs, instead of improving public health [16-19]. In this regard, honesty is a basic element in medical ethics is based on physician-patient relationships [20-22].

The relationship between patient safety and defensive medicine is another aspect of this problem that has also been a subject of study in recent years [23-24]. On the other hand, various studies have shown that occurrence of medical errors lead to threat patient safety and has raised great concerns internationally which result in 44 to 98 thousand deaths in the USA and by the same cause are 20, 18 and 40 thousand every year in Canada, Australia and the UK, respectively [25-32].

The third aspect of defensive medicine behavior is potential tension that every physician might have to endure is being faced with a patient's complaint following a medical error. This can produce stress, depression and self-isolation in physicians [33]. However, a considerable part of such complaints can be prevented if physicians behave in compliance with professional ethics [34-35].

In the other wards induced demand is created by providing extra information and care with suspicious value to the patient [36-41]. Furthermore, economical and social factors play an important role in the prevalence of induced demand influencing other parts of the health care system [37,42,43]. Induced demand has created a false competition among the physicians who follow their own unethical economic interests than on benefits of the patient [44,45]. Also, regulatory barriers may also affect induced demand. For example, lack of clinical guidelines and lack of appropriate infrastructure in health care system can complicate supervision and mislead the physicians [46-47].

Several studies in Iran have shown that there are a lot of drug interactions in prescriptions [48,49]. In addition, patients complaints about induced demand constitute 42-53% of the overall complaints in Iran which originated from defensive medicine [50-52].

Therefore, this study aimed to investigate the occurrence of defensive medicine behaviors among the physicians of public and private hospitals of Tehran University of Medical Sciences in 2015-2016.

Research Method

This present study was a descriptive-analytical and cross-sectional study was conducted in 12 public and private hospitals affiliated with Tehran University of Medical Sciences. As the largest and highest ranking medical university in Iran, this organization provides more than half of Tehrans' health care facilities. The private hospitals had at least four major internal, pediatrics, surgical, and gynecology departments - and were included as the general hospitals.

Of a total of 1148 physicians and medical assistants working in the above hospitals at the time of study, 597 in private, and 551 in public hospitals were selected as research society based on Information technology department of the university. Minimum sample size was 228, using Krejcie and Morgan sample size method according to research population in each hospital. To

improve accuracy, this number was increased to 300 to have more precision. At the end, 150 physicians from the public hospitals, and 150 physicians from the private hospitals, and totally 300 were randomly selected.

The research tool was a researcher-made questionnaire that was prepared using review of literature method. The questionnaire consisted of three parts: the first part was about demographic information, including age, gender, marital status, educational degree, work experiences, and liability insurance of the physicians. The second part consisted of 15 questions asking about the frequency of defensive medicine behaviors: (13 items were related to positive defensive medicine and 2 were related to negative defensive medicine).

Each item had five options: never, seldom (1-3), sometimes (4-6), often (7-9), and always (more than 10) times. According to Lickert scale the third part consisted of 11 items that assessed the reasons of defensive medicine behaviors prioritized 1-5 score, retrospectively.

To evaluate the face validity of the questionnaire, it was distributed to seven members of the expert group, consisting of faculty members, experts of health care management and physicians. For calculation of Content Validity Index (CVI), the experts determined the clarity, simplicity, and relevance of each item based on a five part Lickert scale as 1 ± 0.5 with the final score of 80% to categorize the items in 3 parts as "necessary", "useful but not necessary", and "not necessary". The CVR was assigned as a score of 75% by the experts.

According to collect the required data, the researcher distributed the questionnaires and assured that the results of the study would be confidential. A total of 240 questionnaires out of 300 were completed and returned, and thus, the response rate was 80% the collected data were analyzed in SPSS version 20 using descriptive statistical tests including, percentage, average and T-test, Anova, and Chi-square with $P \leq 0.05$ as analytical techniques. Defensive medicine behaviors were scored in a scale of low [1-33], average [34-66] and high (67-100).

To test the equality of averages and variances of the two research populations consisted of public and private physicians, and to check the priority of variance equality test prioritized over averages equality test, Levene's test and F-score were used. In addition, T-test was used to test the equality of averages of the two populations in both cases of equality and inequality of variances between them.

Findings

Table 1 showed the demographic information of the participating physicians. The majority of the physicians were male, 31-40 years old, married, with 11-20 years work experiences, had liability insurance and were specialists.

According to (Table 2), the results showed that the most frequent positive defensive medicine behaviors were "requesting extra details from patients about their diseases", "giving extra details from patients about how to take the medication properly", and "following up the extent success of a treatment" respectively. Between the two negative defensive medicine behaviors, "avoiding potentially beneficial but risky treatment methods" was the most frequent.

According to the results of Levene's, T-tests, and $P=0.05$, while in the equality of averages test $P \geq 0.05$, inequality of defensive medicine in public and private hospitals was rejected with 5% error. Therefore, defensive medicine has a generally equal status in both public and private hospitals (Tables 3 and 4).

Demographic details		Number	Percentage
Sex	Man	160	66
	Woman	80	34
Age	<30	58	24
	31-40	86	36
	41-50	48	20
	51-60	23	10
	> 60	25	10
Marital status	Single	90	38
	Married	150	62
Work experiences	Less than a year	50	21
	1-5 years	67	28
	6-10 years	39	16
	11-20	45	19
	> 20	39	16
Liability insurance	Yes	155	64
	No	85	36
Education	General practitioner	75	31
	Medical assistant	65	27
	Specialist	100	42

Table 1: Demographic information of the participating physicians

According to (Table 5), there was a significant relationship between age and using defensive medicine by the physicians ($P=0.049$). In other words, older physicians were less likely to opt for defensive medicine behaviors. Also, Pearson correlation test and Chi-square test did not show any significant relationship between defensive medicine behaviors and each of sex, marital status, education, liability insurance, and work experience of the physicians and the type of defensive medicine they use (positive or negative).

According to (Table 6), the most important reason why physicians of Tehran University of Medical Sciences hospitals used defensive medicine was following professional and ethical instructions and standards.

Discussion

This study was the first research to investigate the status of defensive medicine in public and private hospitals in Tehran, Iran.

Defensive medicine can even affect the accessibility of patients to health care system in three ways. First, physicians leave regions with higher risk of erroneous treatment, thus leaving the patients with low access to medical care. Second, physicians are sensitive to costs, not as a matter of money but as a matter of time. Third, defensive medicine behaviors can affect the quality of patient care. However, there is no clear expenditure pattern in this regard [53-59].

Defensive medicine behaviors		Frequency (%)				
		Never	Seldom	Sometimes	Often	Always
Positive defensive medicine behaviors	Prescribing unnecessary paraclinical services	22	36	11	4	27
	Prescribing unnecessary treatments	47	22	12	6	13
	Prescribing unnecessary drugs	44	21	10	12	13
	Referring patients to be hospitalized where outpatient treatment is possible	57	12	12	6	13
	Unnecessarily referring the patient to other medical specialists	52	16	14	6	12
	Emphasizing timely visits	11	21	12	12	44
	Giving extra details to patients about how to take the medication properly	7	20	18	15	40
	Requesting extra details from patients about their diseases	7	21	11	16	45
	Following up the extent success of a treatment	16	14	23	15	32
	Filing patient records	10	15	22	14	39
	Giving extra details to patients about the treatment methods	13	14	20	12	41
	Involving the patient in the process of selecting an appropriate treatment methods	8	18	22	18	34
Negative defensive medicine behaviors	Registering specific statements in the patient medical records	15	25	10	10	40
	Avoiding potentially beneficial, but risky treatment methods	21	19	22	13	25
	Avoiding accepting high-risk patients	40	20	12	10	18

Table 2: Relative frequency distribution (%) of positive and negative defensive medicine behaviors in the participating physicians

	Hospital type	Number of physicians	Average	Standard deviation	Average standard error
Defensive medicine	Public	135	3.05	0.694	0.085
	Private	105	2.93	0.864	0.126

Table 3: Results of T-test for determining equality of averages for defensive medicine status in private and public hospitals

Defensive medicine	Levene's test for equality of variances		T-test for equality of means						
	F-score	P value	T-score	Degree of freedom	P value	Difference of averages	Difference of errors	95% confidence interval	
								Lower limit	Upper limit
Equality of variances	3.764	0.055	0.836	112	0.405	0.122	0.146	- 0.168	0.412
Inequality of variances	3.610	$P=0.05$	0.804	84.954	0.423	0.122	0.152	- 0.180	0.424

Table 4: Results of Levene's test and T-test for determining equality or inequality of variance and average

Variable	Pearson correlation coefficient	Significance	Frequency
Age	0.183	0.049	240

Table 5: The relationship between age and using defensive medicine

Priority	Reason	Frequency	Percentage
1	Following clinical standards and professional ethics	41	29
2	Concerns for legal actions by the patients	33	23
3	Fear of disciplinary actions by the medical council organization	28	20
4	Concerns resulted from patients complaints about actions of other physicians	22	16
5	Concerns for the patients' potential compensation claim	16	12

Table 6: Reasons for using defensive medicine in the studied physicians

The results of this study showed that nearly half of the physicians employed positive defensive medicine. Although, some positive defensive medicine behaviors were observed in more than 50% of the physicians. On the other hand, nearly half of the physicians used negative defensive medicine in their profession.

It should be mentioned that some of positive defensive behaviors, are behaviors that increase accuracy of treatment without creating any extra costs for the patient or the health care system [60-62]. This is compatible with current results. However, only a few participating physicians in current study used negative defensive medicine. Possible reasons for using negative defensive medicine could be low self-confidence, lack of specialized knowledge, low risk-propensity, fear of losing reputation because of an unfortunate event, fear of negative advertisements, and poor support from insurance companies [54]. Actually, there is not clear reasons for defensive medicine behaviors of physicians in Tehran University of Medical Sciences because lack of completely awareness and familiarity with these behaviors in comparison with other countries.

“Summerton” reported defensive medicine behaviors in general physicians was more than medical specialist [63] that is not similar to current results. Hiyama “et al”. showed the frequency of defensive medicine behaviors in Japan is considerably more than that in the current study. This might be because of the higher rate of patient complaints, specially about negative behaviors [64]. The results of a study on 300 physicians in Halifax, Canada showed that a large number of these physicians ordered laboratory tests, referred patients to other specialists, used interventional methods, such as biopsy to confirm the diagnosis, while this was not medically necessary in most cases, and prescribed unnecessary antibiotics [65]. Also, Katz *et al.* (2005) and a study in Pennsylvania, United States in 2002 confirmed the results of our study [66-67].

Medical Association of Massachusetts and American Medical Association in USA showed the majority of physicians used defensive medicine behaviors [68,69].

Department of Health in London investigated on 2416 physicians revealed that they ordered extra laboratory tests and treatments unnecessary for the patients. The results, however, did not show any significant difference between male and female physicians [70]. This is compatible with the results of current study. Furthermore, younger physicians used more often defensive medicine behaviors [71] that is similar with our results of study. Investigations of Ortashi “*et al.*” also confirm the findings of the current study about the relationship between age with defensive of physicians medicine behaviors [72].

Physicians worked in Oregon and Massachusetts in USA announced that they would increase defensive medicine practices related to lack of self-confidence caused increased treatment costs, poor access of patients to medical care, and undesirable quality of treatment [73]. Clark and Hankins (2003) estimated that liability costs in America consisted 7-11% of health insurance premiums because of widespread use of defensive medicine increased healthcare costs by 10%, which was followed by an undesirable increase in outpatient costs [74]. Also, Studdert, et al. reported that defensive medicine was a routine practice in Pennsylvania, USA, and physicians in this state pay the highest liability insurance premiums [75]. In a study by Wang (2006) conducted in Chicago, USA, many physicians had no fear to report using “forbidden drugs” instead of “diagnostic drugs” as defensive medicine decreased the accessibility of patients to appropriate health care system [76].

Results of all studies conducted in other countries, including USA and Canada, indicated that defensive medicine behaviors are either due to professional and ethical standards or have other reasons. But in our study, most of the physicians used defensive medicine to follow clinical standards and professional ethics. Moreover, Jafarian, “*et al.*” studied cases of complaints to Iranian Medical Council – Tehran Branch and reported that causes of a large number of patient complaints were related to treatment errors, financial problems, and negligence by physicians. However, the formally confirmed cases of negligence were fewer than those claimed by patients [37]. In such cases, the reason may be sought in the type physician-patient relationship, i.e. some issues have not been justified for the patient.

The other findings of this study also showed that there was no significant difference between specialists and general physicians regarding the extent of using defensive medicine. Abdoli concluded that induced demand was more prevalent among general physicians compared to specialists in Iran [77] that was similar to that of another study by Abdoli and Rahrami [78]. However, these findings are not consistent with our findings. However in a qualitative study, Keivanara “*et al.*” argued that induced demand was affected by infrastructural, social and structural factors in this country [79]. These factors were not investigated in the current study.

The studied physicians of current study claimed that their priority in using defensive medicine was complying with standards of professional ethics. On the other hand, more than half of the physicians who participated in Kane’s study believed that employing defensive medicine was mostly to protect the physicians, not the patient; especially if a defensive medicine practice involved an interventional surgical procedure not

necessarily to the benefit of the patient, which was not compatible with professional medical ethics [80]. In this regard, Brown and Brush argued that not all defensive medicine behaviors, for example patient – physician improved relationship, clear medical records of patients, and improved clinical reasoning that enhance job security for the physician violated medical ethics [81]. Xiao in China report physicians tend to defensive medicine behavior, which can increase medical errors. Therefore, the Chinese government is trying to solve this problem and improve professional ethics among its physicians [82]. Deville believed that physicians tend to use defensive medicine behaviors to influence patient care and increase health care costs in an unethical way [83]. Therefore, we claim that Iranian physicians in Tehran have less negative defensive medicine because of consideration of medical ethnics and professional commitment.

This study has its own limitations. One limitation is that it was conducted in a specific time period, and therefore the results might not be generalizable to all times. Another limitation is that the data were collected through self-assessment questionnaire.

Conclusion

The results showed that physicians in Tehran commonly employ defensive medicine. Although, the positive aspects of this phenomenon may improve quality of patient care and reduce health care costs, and despite the fact that in current study, many physicians use defensive medicine to comply with professional ethical standards, but there is a prospect of increased negative defensive medicine behaviors and use of positive defensive medicine without any consideration for ethical standards, and this can be dangerous for Iranian health care system effectiveness. Especially after Health System Evolution Plan (HSEP) in Iran since 2016. Accordingly, it is recommended that clinical guidelines and standards be prepared to increase the awareness of physicians, specially those with less work experiences, and increased awareness of the physicians about legal and professional aspects of their profession could reduce unnecessary concerns about complexities and problems of their job, and negative consequences of defensive medicine. Since, cultural and social conditions affect defensive medicine behaviors in Iran, and since the concept of defensive medicine is relatively new phenomenon in Iran, especially after implementation of HSEP in Iran since 2016, we recommend that other researchers conduct comparative studies in other parts of the world. Although, the authors are sure defensive medicine has been conducted, considered, studied, and generally remedied for decades in other countries, but not perfectly just in Iran.

Competing interests

We certify that we have no competing interest with organization regarding the material discussed in this manuscript.

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