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Physicians' defensive medicine practices: a cross sectional study in Cairo

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Abstract

Background: Defensive Medicine (DM) refers to any medical care that physicians deliver without improving the patient's benefits. The practice of DM has been more widespread globally in recent decades due to the increasing number of lawsuits filed against doctors in all medical specialties. This study aimed to study reported practices of DM by physicians working in Cairo and its associated factors. **Methods:** cross-sectional study was conducted on 580 physicians with durations of work experience exceeding two years from all specialties who are working at different health care facilities in Cairo which were categorized into teaching hospitals (included university hospitals and teaching hospitals affiliated to the Ministry of Health (MOH), health care facilities affiliated to MOH (included all health care centers and hospitals other than teaching hospitals), and private health care facilities. An online self-administered structured questionnaire was used for data collection. **Results:** Positive defensive practices were more common than negative (avoiding) practices; unnecessary consultation of senior colleagues was the most common practice, followed by making unnecessary follow-up visits. Avoiding management of high-risk patients was the most common negative DM practices, followed by avoiding high-risk procedures. Physicians who were litigated of malpractice showed significant increases in frequencies of reporting the following DM practices. **Conclusion:** Positive DM practices were more common than negative practices, and unnecessary consultation of an expert was the most common practice, followed by unnecessary frequent follow-up. There was an association between DM practices and physicians' exposure to litigation of malpractice.

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Key words defensive medicine, malpractice, practices, litigation, Cairo

Introduction

Defensive Medicine (DM) refers to any medical care delivered by the physicians that aiming mainly to reduce the risk of litigations, not to benefit the patient (Kakemam et al., 2022). It is like a disease in the healthcare system as it prevents patients from receiving high-quality care in accordance with doctors' moral, legal, and ethical obligations. Moreover, defensive medical techniques which intend to reduce malpractice liability may also have a detrimental impact on the health care system by raising costs and decreasing care quality (Pischedda et al., 2023).

The practice of DM has been more widespread globally in recent decades as a result of an increase in the number of lawsuits filed against doctors in all medical specialties. Consequently, the doctors either "out of fear of malpractice litigation" or "to lessen their exposure to litigation" employed DM (Frati et al., 2015).

Depending on the situation, DM actions could be either positive or negative: "positive defensive medicine" involves prescribing superfluous medications, referring the patient to other specialists, asking for extra investigations, stressing the importance of on-time appointments, and offering more information about how to take the medications as directed. Conversely, negative defensive medicine involves avoiding treating patients who pose a risk and preventing them from being admitted to the hospital, as well as refraining from providing risky medical therapies even when they may be beneficial to the patient (Chen, 2007).

Regarding the circumstances in Egypt, it was stated that hundreds of malpractice cases are received annually by the Egyptian Medical Syndicate's Committee of Medical Ethics. Over the past ten years, there has been a steady rise in the number of malpractice cases brought against healthcare practitioners. In light of an overworked and underfunded healthcare system, this was justified by raising patients' awareness of their rights. This could account for the high frequency of defensive medicine practice and the feeling of insecurity among Egyptian physicians (Abdo et al., 2021).

This survey was conducted on physicians working in health care facilities in Cairo to study their reported incidence of practicing DM and its associated factors.

Subjects and Methods

This descriptive cross-sectional study was conducted on 580 physicians working at different health care facilities in Cairo, from all specialties. Physicians who have durations of work experience less than two years were excluded. Epi infoTM 7 statistical program was

used to calculate the sample size for cross sectional study with confidence level 95% and test power 80%.

Tool of data collection: An online self-administered structured questionnaire was used for data collection. The items of the questionnaire were settled after reviewing previous literature and similar studies in Egypt and other countries (Ahmed et al., 2019), (Yassa and Peter, 2018). A pilot study was done on 20 physicians to test clarity and validity of the questionnaire. After final modifications and changes, the final form was disseminated to potential participants via email and through groups on social media.

Ethical consideration:

This study was performed in accordance with the principles of the Declaration of Helsinki, and approved by the Human Research Ethics Committee of Faculty of Medicine, Ain Shams University (Ethics approval number: FMASU FWA 000017585).

There was an informative introduction of the online questionnaire that explained the aim of the research and confirmed maintenance of confidentiality. It contained a clear statement that physician's agreement to fill in the questionnaire will be considered as an implied consent to participate in the study. Confidentiality of data was ensured through anonymous data collection and analysis.

Statistical analysis:

IBM SPSS statistics was used for statistical analysis. Since all variables were categorical; frequency and percentage were used as descriptive statistics, and Chi square test and Fisher's Exact were used to compare frequencies between groups. All reported P values are two-sided (P> 0.05: non-significant, P< 0.05: significant).

Results

The study included 580 participants working in seven health care facilities in Cairo. The workplaces of the participants were categorized into teaching hospitals (included university hospitals and teaching hospitals affiliated to the Ministry of Health (MOH), health care facilities affiliated to MOH (included all health care centres and hospitals other than teaching hospitals), and private health care facilities. Table (1) shows the sociodemographic characteristics of the respondent physicians; most of them were females (483 physicians, 83.3%), in the age group ranged from 30 to 40 years (391 physicians, 67.4%), and working at health care facilities affiliated to the MOH (303 physicians, 52.2%). Most of them obtained the master's degree in their specialties (369 physicians, 63.6 %),

The specialties of the respondent physicians were categorized as the followings: medical specialties (included internal medicine, pediatrics, primary health care (GP), cardiology, chest, dermatology, family medicine, emergency medicine, audiology, phoniatric, psychiatry, geriatric medicine, physical medicine, and oncology), surgical specialties (included general surgery, orthopaedics, plastic surgery, ENT, gynaecology and obstetrics, and ophthalmology), anaesthesiology and intensive care, diagnostic radiology, and laboratories. Medical specialities were the most common (303 physicians, 52.2%).

Table (2) shows the reported defensive medicine practices by the participants; the positive defensive practices were more common than negative (avoiding) practices as most of the participants reported unnecessary consultation of senior colleagues (either always (380, 66.7%), or sometimes (183, 30.6%); and unnecessary frequent follow-up (either always (323, 58.6%) or sometimes (190, 34.3%)). The most common negative defensive practices was refusal of management of high-risk patients (always (66, 12.4%), or sometimes (315 ,59.1%)), followed by avoiding high-risk procedures (always (62, 12.7%), or sometimes (244, 49.8%).

Table (3) shows comparison of defensive medicine practices between respondents who were sued by malpractice and other participants. Although physicians who were exposed to litigations of malpractice had greater frequencies of reporting all defensive practices, statically significant increases were found in frequencies of: unnecessary consultation from other specialists (X2: 4.66, P value:0.031), prescribing unnecessary medications (X2: 4.48, P value: 0.034), refusing to admit the patient to the hospital and referring him to another one (X2: 6.42, P value:0.011), and unnecessary hospitalization (X2: 4.24, P value: 0.039).

There were non-significant differences in the frequencies of reporting defensive medicine practices between the participants according to their sociodemographic characteristics (age group, gender, specialty, job title, or the category of the workplace) either positive or negative practices.

Table (1): Sociodemographic characteristics of the respondent physicians

Sociodemographic characteristics		No.	%
Age groups	<30 y	145	25.0
	30-40 Y	391	67.4
	>40-50 Y	28	4.8
	> 50Y	16	2.8
Gender	Female	483	83.3
	Male	97	16.7
Job title	Resident	240	41.4
	Specialist	270	46.6
	Consultant	70	12.1
Specialty	Medicine	303	52.2
	Surgeries	166	28.6
	Anesthesia, ICU	44	7.6
	Radiology	46	7.9
	Laboratories	21	3.6
Workplace	Teaching hospitals	247	42.6
	Health care facilities affiliated to Ministry of Health	303	52.2
	Private healthcare facilities	30	5.2
Post-graduation study	Diploma	58	10.0
	Master's degree	369	63.6
	MD degree	84	14.5
	Egyptian fellowship	47	8.1
	Foreign fellowship	10	1.7
	None	12	2.1
Training/ clinical experience abroad	No	502	86.6
	Yes	78	13.4
Duration of work experience	2-5 Y	247	42.6
	5-10 Y	241	41.6
	11-15 Y	51	8.8
	> 15 Y	41	7.1

Table (2): Reported defensive medicine practices by the participant physicians:

Defensive medicine practice		Always		Sometimes		Never		Not Applicable	
		N	%	N	%	N	%	N	%
Positive	Prescribing unnecessary medication to the patient	7	1.3	181	33.5	352	65.2	40	6.9
	Asking for more investigations than necessary	14	2.5	331	59.3	213	38.2	22	3.8
	Hospitalizing the patient without indications	2	0.4	115	21.8	411	77.8	52	8.9
	Asking for unnecessary consultation from other specialists	101	18	326	48.2	133	23.8	20	3.4
	Asking for unnecessary consultation from senior colleagues	380	66.7	183	30.6	16	2.8	10	1.7
	Making more frequent follow-ups than necessary	323	58.6	190	34.5	38	6.9	29	5
Negative	Avoiding managing high-risk cases	66	12.4	315	59.1	152	28.5	47	8.1
	Avoiding participation in high-risk procedures	62	12.7	244	49.8	184	37.6	90	15.5
	Avoiding patient's admission at your hospital and referring him to another one	4	0.7	130	24.3	401	75	45	7.75

Table (3): Chi square test comparing defensive medicine practices between participants according to previous litigations of malpractice:

Previous exposure to litigation of malpractice / Defensive medicine practice	No		Yes		X^2	P value
	N	%	N	%		
Prescribing unnecessary medication to the patient	153	30.6	35	43.8	4.48	0.034*
Asking for more investigations than necessary	290	58	55	68.8	2.49	0.115
Hospitalizing the patient without indications	93	18.6	24	30	4.24	0.039*
Avoiding patient's admission at your hospital and referring him to another one	107	21.4	27	33.8	6.42	0.011*
Asking for unnecessary consultation from other specialists	360	72	67	83.8	4.66	0.031*
Asking for unnecessary consultation from senior colleagues	477	95.4	77	96.3	0.26	0.611
making more frequent follow-ups than necessary	440	88	73	91.3	0.72	0.396
Avoiding managing high-risk cases	322	64.4	59	73.8	1.31	0.252
Avoiding participation in high-risk procedures	255	51	51	63.8	3.27	0.07

%: Percentage from the total number of the group, *: Significant P value (< 0.05)

Discussion

Defensive medicine, as a phenomenon, requires a thorough comprehension of all its aspects, including underlying and surrounding variables (Eftekhari et al., 2023). Since there are no laws for medical liability in Egypt till now, trials of litigations of malpractice are done by the ordinary court according to the current legislations. Therefore, doctors can be accused by civil or criminal responsibility and may face rulings of compensation or imprisonment as a penalty for medical errors. Moreover, there is no insurance to support payment of compensations. All these circumstances exert severe stress on the doctors that may enforce them to DM practices in order to avoid incidence of complications and the consequent litigations of malpractice (Egyptian Medical Syndicate, 2024).

The present study found the frequencies of reporting positive DM practices were greater than that for negative practices, which is not consistent with previous studies on Egyptian doctors that found higher prevalence of negative DM practices (Arafa et al., 2023 and Elmalt et al., 2024). This can be due to the relatively younger participants of these studies who were less experienced and may prefer to avoid managing high-risk cases (the number of specialists and consultants in the present study was greater than the residents).

Unnecessary consultation of senior colleagues was the most common defensive practice, followed by unnecessary frequent follow-up. This is in accordance with Arafa et al., (2023) as they found arranging unnecessary referrals to consultation as the most frequent positive DM practice, followed by ordering unnecessary tests. This can be explained by the participants' care to confirm an accurate diagnosis, appropriate treatment plan, and close monitoring of the patients to avoid incidence of complications or adverse events. However, this also increases the burden on doctors and the health care system especially with the current shortage of facilities and personnels.

Although consultation of colleagues can help the doctor to adjust the treatment plan, the attending physician still bears the primary responsibility. The consulting physicians have a duty to report their opinions about the patient's condition and recommendations of the best treatment options to the attending physicians in a comprehensive manner (Arslan et al., 2010).

The findings of the present study are consistent with an Italian retrospective observational study on insurance complaints database for anesthetic accidents that result in injuries to the patients that found 67.3% of physicians asked for unnecessary specialist consultancy (Petrucci et al., 2021).

In contrast, previous studies found asking for unnecessary investigations as the most common defensive medicine practice in Pennsylvania (61.8%) (Studdert et al., 2005) and UK (65%) (Ortashi et al., 2013). This may be due to the health insurance system in these countries that enables doctors to ask for more investigations without adding more burden on the patient, which is not available in Egypt.

As regard negative defensive practices, the most common practice was refusal of management of high-risk patients either always (66, 12.4%), or sometimes (315, 59.1%), followed by avoiding high-risk procedures either always (62, 12.7%), or sometimes (244, 49.8%).

Garg et al., (2020) found that a high percentage of neurosurgeons refer sick patients to high-volume centers with greater expertise because of fear of malpractice suits. They found 60.8% of neurosurgeons working in the private sector and 43.5% of those with multiple affiliations prefer not to manage or operate on patients with high risk for complications or medico legal issues. Also, Hiyama et al., (2006) found that avoidance behaviors, such as avoiding certain procedures or interventions and avoiding caring for high-risk patients, were very common in Japan as 75% of respondents reported often avoiding certain procedures or interventions.

In these cases, defensive medicine works against bioethical principles in a relational way, as there is disrespect to principle of beneficence which must be applied in favor of the individual and regarding the social benefits of all communities. It is important to note that DM is firmly questioned morally and ethically (Miziara and miziara, 2021).

It was striking to find nonsignificant differences between the participants of the present study in DM practices according to their sociodemographic characteristics, which is not consistent with the

findings of previous studies on Egyptian doctors (Arafa et al., 2023 and Elmalt et al., 2024), even the practice of unnecessary consultation of senior colleagues that was expected to be less frequently used by consultants and more experienced doctors. This can be due to the increasing stress and fair of litigations that may drive the doctor to search for support from their professional peers (Lorenc et al., 2024)

Nevertheless, the present study found physician's exposure to previous litigation of malpractice was associated with greater frequencies of some DM practices which agrees with several studies that reported the same findings in Egypt (Arafa et al., 2023, Hasan et al., 2021), USA (Studdert et al., 2005; Asher et al., 2007 and Nahed et al., 2012), UK (Ortashi et al., 2013) and Italy (Petrucci et al., 2021).

Arafa et al., (2023) found that experiencing malpractice claims was associated positively with defensive medicine. It is considered the main drive of defensive medicine; this association was more reported with positive defensive medicine practices than negative ones. This can be attributed to a perception that they will not be sued for negative actions.

The perceived threat of malpractice may have three elements: the risk of a malpractice sues, the probability of a claim leading to compensation, and the size of payment that the physicians should pay for the patient or his relatives (Jena et al., 2011). However, defensive medicine practice does not necessarily prevent malpractice claims and more importantly it may lead to poor outcomes. Unnecessary investigations imply over diagnosis and overtreatment is considered a kind of error of commission (Williams et al., 2021).

Lorenc and his/her associates, (2024) reported several motivations for DM practices that included fear of litigations and complaints, clinicians' feeling of lack of support from their institutions or professional peers, pressure from demanding patients, the lowered tolerance of risk and greater expectations of treatment outcomes by the society that blame doctors for any negative outcome, and fear of adverse patient events that results in excessive caution by the clinician. All these factors are fulfilled in Egypt, in addition to the media that is constantly increasing the public anger against doctors and blame them for all deficiencies in the health care system.

References

Ahmed Z, Saada M, Jones AM, & Al-Hamid AM (2019): Medical errors: Healthcare professionals' perspective at a tertiary hospital in Kuwait. PloS one, 14(5): 1-14

Abdo H, Aboubakr H, & Basyoni H (2021): How prevalent is the defensive medicine practice among the Egyptian. The Egyptian Journal of Forensic Sciences and Applied Toxicology, 21(4): 57-64.

Arafa A, Negida A, Elsheikh M, Emadeldin M, Hegazi H & Senosy S (2023): Defensive medicine practices as a result of malpractice claims and workplace physical violence: a cross-sectional study from Egypt. Sci Rep 13, 22371

Arslan S, Berk S, Bulut G, Karşıyaka H, et al (2010): Evaluation of bedside pulmonary consultations in a university hospital. Cumhur Med J., 32:199–204.

Asher E, Parag Y, Zeller L, Yerushalmi R, Reuveni H (2007): Unconscious defensive medicine: The case of erythrocyte sedimentation rate. European Journal of Internal Medicine, 18(1), 35–38.

Chen XY (2007): Defensive medicine or economically motivated corruption? A confucian reflection on physician care in China today. The Journal of medicine and philosophy, 32(6): 635–648.

Eftekhari MH, Parsapoor A, Ahmadi A, Yavari N, Larijani B & Gooshki ES (2023): Exploring defensive medicine: examples, underlying and contextual factors, and potential strategies - a qualitative study. BMC Med Ethics 24:

82.

Egyptian Medical Syndicate, (2024): The Medical Syndicate addresses the Council of Ministers with its comments and suggestions on the draft medical liability law.

Elmalt G, Aboseoud A, Elsaid A, Hamed M (2024): knowledge, Attitude, and Practices of Defensive Medicine Among Junior Physicians; A Cross-sectional Study at Zagazig University Hospitals. Zagazig University Medical Journal, 2024; (4416-4427).

Frati P, Busardò FP, Sirignano P, Gulino M, Zaami S, Fineschi V (2015): Does defensive medicine change the behaviors of vascular surgeons? A qualitative review. BioMed research international, 170692.

Garg K, Sharma R, Raheja A, Tandon V, Katiyar V, Dash C, Bhatnagar R, Khullar MK, Raju B, Anil Nanda A, Kale SS. (2020): Perceptions of Indian neurosurgeons about medicolegal issues and malpractice suits. Neurosurgical focus, 49(5), E10.

Hasan MDA, Shokry DA, Mahmoud RH, Ahmed MM. (2021): Defensive Medicine Practice in Different Specialties among Junior Physicians in KasrAlAiny Hospitals, Egypt. Indian J Community Med, 46(4):752-756.

Hiyama T, Yoshihara M, Tanaka S, Urabe Y, Ikegami Y, Fukuhara T, Chayama K (2006): Defensive medicine practices among gastroenterologists in Japan. World journal of gastroenterology, 12(47): 7671–7675.

Jena AB, Seabury S, Lakdawalla D, & Chandra A (2011); Malpractice risk according to physician specialty. The New England journal of medicine, 365(7), 629–636.

Kakemam E, Arab-Zozani M, Raeissi P & Albelbeisi AH (2022): The occurrence, types, reasons, and mitigation strategies of defensive medicine among physicians: a scoping review. BMC Health Serv Res.; 22(1):800.

Lorenc T, Khouja C, Harden M, Fulbright H &Thomas J (2024): Defensive healthcare practice:

systematic review of qualitative evidence. BMJ Open 2024;14:e085673.

Miziara ID, Miziara C (2021): To what extent is it possible to respect the principle of autonomy in pandemic times? A new approach to Bioethical Principles. J Public Health International. 4(1): 21–23.

Nahed BV, Babu MA, Smith TR, Heary RF (2012): Malpractice liability and defensive medicine: a national survey of neurosurgeons. PLoS One; 7(6): e39237.

Ortashi O, Virdee J, Hassan R, Mutrynowski T, Abu-Zidan F (2013): The practice of defensive medicine among hospital doctors in the United Kingdom. BMC Med Ethics. 29; 14:42.

Petrucci E, Vittori A, Cascella M, Vergallo A, Fiore G, Luciani A, Pizzi B, Degan G, Fineschi V & Marinangeli F (2021): Litigation in Anesthesia and Intensive Care Units: An Italian Retrospective Study. Healthcare (Basel, Switzerland), 9(8), 1012.

Pischedda G, Marinò L, Corsi K. (2023): Defensive medicine through the lens of the managerial perspective: a literature review. BMC Health Serv Res.: 23(1):1104.

Studdert DM, Mello MM, Sage WM, DesRoches CM, Peugh J, Zapert K & Brennan TA (2005): Defensive medicine among high-risk specialist physicians in a volatile malpractice environment. JAMA. 2005; 293:2609–17.

Williams PL, Williams JP, & Williams BR (2021): The fine line of defensive medicine. Journal of forensic and legal medicine, 80, 102170.

Yassa HA and Peter AF (2018): Medical Error Disclosure Can Rescue Malpractice Litigation. Arab Journal of Forensic Sciences & Forensic Medicine, 1(7): 859-868.

ممارسات الأطباء للطب الدفاعي: دراسة مقطعية في القاهرة

ولاء طلعت توفيق و حنان حامد مصطفى و سونيا محمد سيد عزب و شيماء حسن [1]

الملخص العربي

المقدمة: يُشير مصطلح الطب الدفاعي إلى أي رعاية طبية يقدمها الأطباء دون تحسين حالة المريض. وقد ازداد انتشار ممارسة الطب الدفاعي عالميًا في العقود الأخيرة نظرًا لتزايد الدعاوى القضائية المرفوعة ضد الأطباء في جميع التخصصات الطبية. هدفت هذه الدراسة إلى دراسة ممارسات الطب الدفاعي من قِبل الأطباء العاملين في القاهرة والعوامل المرتبطة بها. **طريقة البحث:** أُجريت هذه الدراسة المقطعية على أطباء من جميع التخصصات يعملون في مرافق رعاية صحية مختلفة في القاهرة، ولديهم خبرة عملية تزيد عن عامين. تم استخدام استبيان مُهيكل عبر الإنترنت لجمع البيانات. **النتائج:** كانت الممارسات الدفاعية الإيجابية أكثر شيوعًا من الممارسات السلبية، وكانت الاستشارة غير الضرورية للزملاء الكبار (إما دائمًا (380، 66.7٪) أو أحيانًا (183، 30.6٪) هي الممارسة الأكثر شيوعًا، تليها القيام بزيارات متابعة غير ضرورية (إما دائمًا (323، 58.6٪) أو أحيانًا (190، 34.3٪)). وكان تجنب علاج المرضى المعرضين لمخاطر عالية هو أكثر الممارسات السلبية شيوعًا، يليه تجنب الإجراءات عالية الخطورة. أظهر الأطباء الذين تم رفع دعاوى قضائية ضدهم بسبب سوء الممارسة زيادة كبيرة في الممارسات التالية: وصف الأدوية غير الضرورية، حجز المرضى غير الضروري بالمستشفيات، تحويل المريض إلى مستشفى آخر، و الاستشارة غير الضرورية من أخصائيين آخرين. **الخلاصة:** ممارسات الطب الدفاعى الإيجابية أكثر شيوعًا من الممارسات السلبية، وكانت الاستشارة غير الضرورية من الاطباء الاكثر خبرة هي الممارسة الأكثر شيوعًا، تليها المتابعة المتكررة غير الضرورية.و قد كان هناك ارتباط بين ممارسات الطب الدفاعى وتعرض الطبيب لدعاوى قضائية.

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