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The Practice of Defensive Medicine by doctors in primary health care in the Kingdom of Bahrain

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Abstract: The practice of defensive medicine (DM) including requesting unnecessary tests, procedures and treatments or avoiding risk taking is increasing worldwide. There is no data from the Arab world and Bahrain. It is vital to identify the drivers behind this growing practice in an attempt to combat it. In our study we aimed to estimate the practice of defensive medicine in primary care in the kingdom of Bahrain and to study the factors associated with it. We conducted a cross-sectional study between the months of March and June 2016 in all governmental health centers in the kingdom of Bahrain. Study participants were all the primary care doctors practicing clinically in those local health centers. A total of 247 physicians out of 285 (86.7%) completed the survey. Nearly all (86.6%) reported practicing defensive medicine. Taking more detailed history note taking (66.4%, 95% CI 60.5 -72.3) and ordering unnecessary tests than indicated 60.0%, 95% CI (54 -66.0) and avoiding risky procedures 59.0% (95% CI 53.0 -65.2), were there most common forms of DM practiced. Patient pressure, relief of anxiety and fear of legal claim, 86.4%, 65.0% and 62.0% respectively were the most common reasons given for the practice of DM. Significantly, physicians with more years of experience were less likely to practice DM and more likely to practice with extra hour of work per week ($p< 0.05$). We concluded that the practice of Defensive medicine is highly common among practicing primary care physicians in the Kingdom of Bahrain.

Keywords: Defensive Medicine, Primary Care, Physicians, Prevalence, and Kingdom of Bahrain.

INTRODUCTION

The practice of defensive medicine (DM) is significantly increasing worldwide [1]. The definition of DM includes ordering unnecessary tests, procedures and treatments for the purpose of protecting the doctors from criticism rather than diagnosing or treating the patient [1]. Others have extended this definition to include the avoidance and reduction of risk taking [1].

There are two types of DM: positive and negative defensive medicine. Positive defensive medicine appears in many aspects of daily medical practice like in requesting unnecessary tests, procedures and treatments. While negative defensive medicine includes avoiding high- risk patients or procedures [2].

Currently available data concludes that the practice of defensive medicine is variable worldwide. The reported practice of defensive medicine among general practitioners in Australia and England was 46% and 75% respectively [1, 3]. Whereas the practice is higher amongst higher-risk specialties like emergency medicine, obstetrics and gynecology, general surgery, orthopedics, neurosurgery and radiology in the United States measuring up to 93% [4]. We also found that 60% of physicians from different specialties in a study conducted in Israel, were practicing defensive medicine [5]. Another recent study conducted in 2013 in Southeast Iran found that the frequency of practicing positive and negative defensive medicine among general practitioners was 99.8% and 79.2% respectively [6]. There is no data from the Arab world and in particular, Bahrain. These figures suggest that defensive medicine is incorporated in the daily practice of physicians worldwide, whether it's being used intentionally or unintentionally [6].

It is vital to identify the drivers behind the growing practice of DM in an attempt to combat it. Researches addressing this topic have identified many drivers. The fact that the medical environment is encouraging a malpractice climate, has put doctors under a lot of pressure from the fear of legal malpractice claims pushing them to over-testing and over-treating patients or avoiding high risk patients/procedures [7, 8].

We are also living in an era where both physicians and patients believe that "more is better" and that more medical care leads to better health outcomes.

Patients are also becoming more demanding leading to a conflict between what physicians perceive as standard medical care and what their patients are requesting, leading doctors to practice defensive medicine [7-9].

Another wide-held belief is that modern medicine with its utilization of technology can perform miracles and patients expect perfect outcomes from their physicians. This had led to a culture of blame in case of a medical error [7]. Expensive screening tests have been used by physicians in order to avoid non-financial consequence like negative publicity and fear of institutional and legal claims as well as poor self-esteem [10].

Financial incentives also drive doctors to practice more defensive medicine. The impact of medical industries advertising for the use of more technology and medications should not be overlooked [9, 7].

Uncertainty causes anxiety to both patients and physician. There is no doubt that the practice of medicine is bound by uncertainty. As Sir William Osler stated the "medicine is a science of uncertainty and an art of probability''. Physicians often engage in over-testing and over-treating to overcome their fear of uncertainty [11].

It is worthwhile to highlight the impact of practicing DM on our communities. Many researches have addressed the excess expenditure of the health care system caused by practicing defensive medicine. Studies conducted in USA between 1996, 2009 and 2010 estimated the rising cost of practicing defensive medicine to reach $50, $650 and $850 billion dollars annually respectively, exceeding the costs of treating both hypertension and chronic obstructive pulmonary disease together [5, 12-14].

Physicians also practice defensive medicine to reduce their anxiety from the uncertainty associated with diagnosing and treating the patients but this could be on the expense of the patients. Exposing patients to unnecessary tests and procedures might cause unintentional harm. This violates the principle of "do no harm" of the Hippocratic Oath taken by doctors [8].

From extensive literature search no research has approached this topic in the Gulf Region and in particular in the Kingdom of Bahrain. This study explores the practice and the possible factors associated with defensive medicine in day–to-day practice in primary care in the Kingdom of Bahrain. This study attempts to explore the magnitude of this problem in Bahrain, which in turn could help health care authorities in resource allocation along with finding solutions for this growing phenomenon.

METHODS

Design: Cross-sectional study.

Study Population: All primary care physicians practicing in governmental health centers in the Kingdom of Bahrain (285 physicians) were included.

Questionnaire

A Questionnaire was used from a previous study conducted in Italy by Maurizio Catino entitled "Blame Culture and Defensive medicine". The approval for using the questionnaire in our study has been obtained by the aforementioned author. The questionnaire included both dependent and independent variables. The independent variables were age, sex, qualification, years in practice and average number of patients seen per day. While dependent variables were divided into two parts: The first part, addressed defensive medicine in many items studied on a Likert scale. The second part studied the factors that influence the practice of defensive medicine. The content of the questionnaire was validated. The questionnaire paper provided basic information about the study and return of the questionnaire constituted evidence of informed consent. Questionnaire papers were returned in sealed envelopes.

Data collection

Following research committee review and approval, the questionnaire was distributed between March and June 2016 to 285 primary care physicians practicing in local health centers in the Kingdom of Bahrain. The distribution of the questionnaire was via the local health centers' In-charge doctors or in cases where the person in-charge was unavailable, face to face distribution was carried out. Multiple follow-up contacts by telephone were made with local health centers' In-charge doctors regarding non-respondents during April and May. Thirty eight physicians failed to respond, this included those who refused to participate, physicians who left the ministry of health and others who were on leave.

Statistical Analysis

The data was analyzed using the SPSS statistics version 23. Frequency, mean, proportions and standard deviation are reported, Multivariate logistic regression was performed to assess the impact of a number of independent variables and the likelihood that respondents would report that they practiced defensive medicine. The independent variables were sex, age, qualification, employment type, years in practice, patients seen per day and number of hours worked per week. The missing data was imputed using completely missing at random method (CMAR).

Ethical consideration

Sufficient information was provided on a sheet prior to filling the questionnaire explaining the objective and ensuring confidentiality to all

participating doctors. Consent was assumed through filling the questionnaire. Ethical approval was obtained from the ethical and research committee.

RESULTS

Of the 285 physicians who were invited to take part in the study, 247 questionnaires were returned, giving a response rate of 86.7%. Mean age of respondents was 43.1years (SD 10.3). One hundred and eighty three (74.0%) were female. Of the 247 physicians, 45.0% were family physicians and 38.5% were consultant family physicians. Ninety six per cent of the participants were practicing full time. The mean number of years worked by the physicians was 15.6 years (SD 10.4). Most participants saw a mean of 55.4 (SD 17.4) patients per day. On average, respondents worked a mean of 44.4 hours per week (SD 8.4) (Table-1).

Table-2 Shows 86.6% of physician reported that they practiced DM a minimum of one to more than 10 times in the last month.

Table-1: Demographic of the sample taking part in the DM survey. Values are numbers (%) Unless otherwise stated. N=247

Age	
All	43.1(10.3)
Male	52.0(9.1)
Female	40.0(8.8)
Sex	
Male	64(26.0)
Female	183(74.0)
Qualification	
General Practitioner	41(16.6)
Family Physician	111(45.0)
Consultatnt Family Physician	95(38.5)
Employment status	
Full Time	238(96.4)
Part Time	9(3.6)
Number of years in practice Mean (SD)	15.6(10.4)
Number of patients seen/day Mean (SD)	55.4(17.5)
Number of hours worked/week Mean (SD)	44.4(8.4)

Table-2: Overall Practice of Defensive Medicine

		n	%
Overall Practice of Defensive Medicine	Never	33	13.4%
	Yes	214	86.6%
	Total	247	100.0%

Table-3: Types of DM practiced by physician in Primary Care in Kingdom of Bahrain. Minimum once or > 10 times in the last month. N=247

Types of DM	N (%)	95% CI
Order more tests than medically indicated	148 (60.0)	53.8 - 66.0
Suggest invasive procedures (e. g, biopsy) to confirm diagnosis	50 (20.2)	15.2 – 25.3
Prescribe unnecessary treatment	98 (39.7)	33.6 – 45.8
Prescribe unnecessary drugs	106 (43.0)	36.7 – 49.1
Refer patient to other specialist unnecessarily	96 (39.0)	32.8 – 44.9
More detailed note-taking in the case history	164 (66.4)	60.5 – 72.3
Avoid certain risky procedures or interventions	146 (59.1)	53.0 – 65.2
Avoid caring for high-risk patient	36 (14.6)	10.2 – 19.0

Table-3 shows that of the 214 respondents who practiced DM, the most common form was, “taking detail history” 66.4% (95% CI 60.2-72.3), followed by “ordering more test than called for” 60.0% (95% CI 53.8-66.0) and 59.1% (95% CI 53.0-65.2) stated they “avoided risky procedures and interventions”. Whereas the least form of defensive medicine practiced was “avoiding caring for high-risk patient” 14.6% (95% CI 10.2-19.0)

Table-4: Reason for practicing DM mentioned by Primary Care Physicians practicing in Primary Care in Kingdom of Bahrain N= 214

Reasons for DM	N (%)	95% CI
Fear of a legal claim	132 (61.7)	55.2 – 68.2
Fear of disciplinary action	118 (55.1)	48.5 – 61.8
Fear of negative publicity / negative image	105 (49.1)	42.4 – 55.8
Previous legal claim involving you	40 (18.7)	13.5 – 23.9
Previous legal claim involving your colleagues	76 (35.5)	29.1 – 41.9
Patient pressure	185 (86.4)	81.9 – 91.0
To relieve doctor anxiety	139 (65.0)	58.6 – 71.3

Table-4 shows the participants response to the reasons behind practicing DM. The most common reasons given by the group were "Patient pressure" 86.4% (95% CI 81.9 -91.0) followed by "relieve of anxiety" 65.0% (95% CI 58.6 – 71.3) and "fear of legal action" 61.7% (95% CI 55.2 – 68.2). The least reported reason was "previous legal claim" against the respondent 18.7 % (95% CI 13.5 – 23.9).

Logistic regression was performed to assess the impact of a number of variables on the likelihood that respondents would report practicing DM. The model contained several independent variables controlling for (Sex, qualification, employment type, years in practice, patients seen per day, number of hours worked per week). The full model containing all the predictors except age was statistically significant $X^2(7, N=247) = 18.01$, $p<0.05$, indicating that the model was able to distinguish between respondents who reported and those who did not report practicing defensive medicine. The model as a whole explained between 7.1% and 13.0% of the variance in defensive medicine practice and correctly classified 86.6% of cases. As shown in table-5, for every extra year of clinical experience, physicians were 4% less likely to practice DM ($p> 0.04$) and for every extra hour worked per week respondents increased the practice of DM by 7% ($p< 0.05$).

Table-5: Logistic Regression between Personal Data and Practice of Defensive Medicine by primary care doctors in Bahrain

	OR	95% C.I.for OR		
		Lower	Upper	Sig.
Gender				
Male	1			
Female	1.4	0.5	3.8	0.5
Qualification				
Cos. Family Physician	1			
General Practitioner	1.4	0.4	4.7	0.6
Family physician	1.6	0.5	4.9	0.4
Employment Type				
Part time	1			
Full time	1.16	0.17	8.1	0.9
Number of years of practice	0.95	0.9	1.0	0.04
Number of patients per day	1.0	0.97	1.03	0.9
Number of working hours per week	1.1	1.0	1.1	0.03

DISCUSSION

The results of this survey showed that the practice of DM amongst primary care physicians was 86.6%, which seems to be higher than the rates reported by the studies conducted in Australia [1], England [3], and Italy [2] in which the rates were 46%, 75%, 77.9% respectively. The reported rates were higher in USA and Japan reaching 90% [4, 15, 16]. A study from Israel [5] showed that the prevalence of DM was 60%, whereas Iran [6] reported 99.8% of positive and 79.2% of negative practice of DM respectively. This high rate of practicing DM found in Bahrain can be explained by the availability of basic laboratory and radiological tests in the clinical setting which can make doctors utilize these facilities in order to overcome uncertainties encountered in the practice of primary care medicine.

Intuitively physicians with longer years in practice were significantly less likely to practice DM. Also physicians working longer hours per week were significantly at greater risk of practicing DM ($p<0.04$). None of the other independent variables studied in this survey contributed significantly in the practice of defensive medicine ($p>0.05$). These findings can be attributed to less experience in younger doctors and those with less working hours. Catino M. also had similar findings regarding the age, as 92.3% of the participants aged between 32-42 years were found to

practice DM [2]. A study from England revealed that physicians above the age of 40 years were significantly less likely to practice defensive medicine in comparison to those aged less than 40 years (P-value = 0.001). They also found that job qualification contributed significantly to the practice of defensive medicine as those working as consultants had lower rates of practice than those in non-consultant posts (P-value 0.000) with the rates of practice of defensive medicine doubling as the grade of the practitioners decreased from consultants through middle grade to junior grade (odd ratio 0.44) [17]. Contrary to our results, the same study also showed that there is no statistical significance between the practice of defensive medicine and gender. On the other hand a study from Iran revealed that gender influenced the practice of defensive medicine, as females practiced defensive medicine significantly higher than their male counterparts [6].

Many forms of practicing defensive medicine were explored in our study. We found that taking more detailed note-taking was the highest practiced form (66.4%). This form of positive defensive medicine was practiced much more in other studies, in comparison to our result, with rates reaching up to 78% in a study conducted on general practitioners in South East Iran[6] and 82.8% in Italy [2]. This result can be due to the current principles of training doctors where emphasis has been made on detailed history taking. Comprehensive explanations to the patients or detailed history taking could be beneficial. As noted in our study, other studies have found that the most widespread form of practicing defensive medicine was ordering unnecessary tests, with similar rates in a recent study from England as well as Nicholas Summerton's study in 1995 among general practitioners in the UK, both showing that 59% would request diagnostic tests to avoid complaints and litigation.[1, 17] Diagnostic tests may reach a defensive level in different doctors. Avoiding risky procedures was the third common type of DM practiced by our respondents. Compared to other papers, the prevalence of unnecessary referrals were much lower in in our study (39%) than the prevalence found by Nicholas Summerton's study as well as the paper published in England where 65% and 55% of GPs arranged unnecessary referrals to avoid litigation [1, 17], respectively. This can be attributed to the easy accessibility and availability of private secondary care specialist clinics in which governmental GP referral are unnecessary.

The most common reason for practicing DM amongst the participants was "patient pressure" 86.4% followed by "relieve of doctor's anxiety" 65% and "fear of legal claim" 61%. Our survey results corresponds to the results from other studies, namely Catino M., who found that 80% of general practitioners practiced defensive medicine from the fear of being involved in a legal dispute [2]. Summerton N., also stated that there was a high correlation between practicing defensive medicine and the fear of being involved in a law suit.[1] Our study findings are reflected by the increased awareness of the medical community and general public of the medico-legal aspects of practicing medicine especially with the establishment of the National Health Regulatory Authority (NHRA) alongside local hospital disciplinary committees. The Study conducted in Iran, on the other hand, cited that only 11.1% of doctors practiced defensive medicine out of concern from legal actions [6]. The practice of negative DM is linked more to the judicial and legal aspects of the regulatory system (NHRA), as it is practiced in order to avoid harmful consequences of patient care and thus avoiding liability in a culture of "name and blame". Furthermore, doctors perceive DM practice to reduce the risk of being involved in litigations.

Our results showed a high rate of practicing DM. It is important to highlight the effect of practicing defensive medicine on our communities and health service. Studies conducted in USA have shown the escalating cost of DM practice year on year which has been estimated to have risen from $50 billion dollars in 1996 to $850.00 billion in 2010, annually exceeding the costs of treating both hypertension and chronic obstructive pulmonary disease together [5, 12, 13]. As our study revealed that 86.6% of the participating doctors reported practicing defensive medicine, this can only direct us to the potential costs and burden such practice is inflicting on the primary care sector in Kingdom of Bahrain.

Our physicians perceived that practicing DM reduces anxiety and reduces patient pressure this action could be linked to dealing with uncertainty in diagnosis and treatment, but at the expense of patients, in terms of exposing the patients to unnecessary tests and procedures, which might cause unintentional harm for the patients. This violates the principle of "do no harm" of the Hippocratic Oath taken by doctors [8].

Strength and weakness

The overall response rate for our survey was excellent 86.7% which is more than reported in other studies. The questionnaire performed well in our study with a Cronbach's alpha of 0.713 for type of DM practiced and 0.78 for reason behind practice of DM. The brevity of the questionnaire encouraged the participants to partake in our study. We also believe that it was of interest to the physician as the subject has not been addressed formally in their setting. The results indicate the generally representative demographic variables of our primary care doctors.

Some biases may have arisen from the choice of questionnaire and from the sampling frame as 17% of respondents were general practitioners with overseas

qualification without post graduate training in Family Medicine.

CONCLUSION

The evidence provided in this survey shows that the practicing defensive medicine among primary care doctors in the Kingdom of Bahrain is high as is shown in other countries. The fear of litigation and malpractice has induced doctors to adopt DM in their everyday practice. The "name and blame culture" must stop as doctors stop learning from their errors to improve reliability and patient safety. Profound cultural transformation is necessary and must start from the top management of the organization in order to create a positive behavior in doctors.

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