

Research Article

The possible effect of clinical governance and hospital accreditation systems on negative defensive medicine

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Author's contribution

Fakher Rahim AND Mehdi Sayyah designed data collection tools, monitored data collection, wrote the statistical analysis plan, cleaned and analyzed the data, and drafted and revised the paper. Farhad Kalantari and Saeid Saeidimehr implemented the study, analyzed the data, and drafted and revised the paper.

Article focus: **1)** Defensive medicine (DM) is explained as ordering more and more tests, or applying various procedures, visits to reduce exposure to medical negligence or malpractice liability; **2)** Negative DM consists of such attempts as increases in follow up, referral rate, and diagnostic testing, as well as prescription of unnecessary drugs; **3)** All medical specialties are at risk of malpractice liability, but some are at high-risk of ligation including orthopedic surgery, ophthalmology, obstetrics/gynecology, general surgery and neurosurgery. **4)** There is lack of data and reports about DM in Iran; thus, we performed the first study to observe the extent and characteristics of DM among Iranian high-risk specialist physicians who are working in oil and refineries health affairs department.

Key messages: **1)** The results showed that DM is more prevalent among orthopedic surgeons and obstetrics and gynecologists; **2)** Although DM may lead to better quality care, it is performing more unnecessary tests, consultants and hospitalization; **3)** Implementing clinical governance and hospital accreditation may lead to shift from negative to positive DM performance, which is beneficial for organization, medical professionals and patients.

Strengths: **1)** The role of clinical governance implementation on hospital referral and health care quality in two main categories including improving quality and outcomes for patients, making health services more patient-centered, and referral inappropriateness; **2)** Clinical governance and hospital accreditation may lead to shift from negative to positive DM performance, which is beneficial for organization, medical professionals and patients.

Limitation: DM is not very prevalent in Iran, so there is no data

ABSTRACT

Background: Defensive medicine (DM) is explained as ordering more and more tests, or applying various procedures, visits to reduce exposure to medical negligence or malpractice liability. **Objective:** We performed observed the extent and characteristics of Defensive medicine (DM) among Iranian high-risk specialist physicians who are working in oil and refineries health affairs department. **Methods:** This is a retrospective, cross-sectional, postal questionnaire survey. A random sample of 30 physicians (aged 25-65 years) from four major medical disciplines including

obstetrics/gynecology, orthopedic surgery, general surgery and ophthalmology was drawn from the Naft grand hospital and oil and refineries health affairs department databases, southwestern region, Iran from 2011 to 2017. Answers to questions on negative DM practices, understanding of certain aspects of the terms of clinical governance and hospital accreditation systems were the main outcomes. **Results:** DM was more prevalent among orthopedic surgeons (30%) and obstetrics and gynecologists (29%). Trends of medical activities showed increasing and decreasing pattern in 2011-2014 and 2014-2017, respectively. The obstetrics and gynecology specialists were more likely increase referral rate (OR: 2.0, 95%CI: 0.457 – 8.74) and follow-up (OR: 2.0, 95%CI: 0.34 – 11.75) in 2011-2014 compared with other high-risk physicians. Hence, general surgeons (OR: 2.5, 95%CI: 0.44 – 13.9) and ophthalmologists (OR: 2.0, 95%CI: 0.34 – 11.75) were more likely increase diagnostic testing. DM is not very prevalent in Iran. **Conclusion:** The results showed that DM is more prevalent among orthopedic surgeons and obstetrics and gynecologists. Although DM may lead to better quality care, it is performing more unnecessary tests, consultants and hospitalization. This study showed that implementing clinical governance and hospital accreditation may lead to shift from negative to positive DM performance, which is beneficial for organization, medical professionals and patients.

Keywords: Malpractice liability; Defensive medicine; oil and refineries health affairs department; Iran; clinical governance; hospital accreditation

1. Introduction

Defensive medicine (DM) is explained as ordering more and more tests, or applying various procedures, visits to reduce exposure to medical negligence or malpractice liability[1]. The fear of malpractice liability leads many physicians even those who practice good medicine in all specialties to engage in DM practices.[2]DM leads to increase in health care costs because exposes patients to unnecessary medical procedures, tests, or visits[3, 4].DM subdivides into two different behaviors including positive and negative features[5].Negative DM consists of such attempts as increases in follow up, referral rate, and diagnostic testing, as well as prescription of unnecessary drugs. While positive DM includes such activities as development of audit system, quality improvements such as increased screening, and more detailed patient note taking. Among many known systems clinical governance, can consider as a systematic approach to quality improvement within a health care system[6].This approach may affect the negative DM performance in high-risk medical specialties such as surgery in term of quality improvements such as increased screening, diagnostic testing and more detailed patient note taking[7, 8]. Other possible effective system could be accreditation, which implements in decreasing negative DM

activities such as increases in follow up, and referral rate [9].

All medical specialties are at risk of malpractice liability, but some are at high-risk of litigation including orthopedic surgery, ophthalmology, obstetrics/gynecology, general surgery and neurosurgery[10].Our previous review also reported that the highest-risk specialist physician in our country were obstetrics/gynecology, orthopedic surgery, general surgery and ophthalmology[11].

There is lack of data and reports about DM in Iran. Thus, we performed the first study to observe the extent and characteristics of DM among Iranian high-risk specialist physicians who are working in oil and refineries health affairs department.

2. Materials and Methods:

2.1. Oil and refineries health affairs department (Khuzestan, Ahvaz, Iran):Oil and refineries health affairs department has maintained a system of health care in Naft grand hospital, southwestern region of Iran, since 1990. In 2015, there were 250 physicians for 90000 patients (3 doctors for every 1,000 people). All Oil and refineries employee were covered by uniform benefits of the aforementioned health care system. A total of 8394 complaints out of 16584 cases were found related to medical malpractice in Iran,

in which malpractice cases appear to have jumped significantly, from 74 cases in 1991 to 822 and 724 cases in 2003 and 2007, respectively [11]. We established both clinical governance and hospital accreditation systems to improve the quality of our health care system on 2011-2017.

2.2. Study design and population: A random sample of 30 physicians (aged 25-65 years) from four major medical disciplines including obstetrics/gynecology, orthopedic surgery, general surgery and ophthalmology was drawn from the Naft grand hospital and oil and refineries health affairs department databases, southwestern region, Iran from 2011 to 2017. The study was approved by Oil and refineries health affairs department ethical committee and all participants granted informed consent.

2.3. Inclusion criteria: Data about negative DM activities of physicians (aged 25-65 years) from four major medical disciplines including obstetrics/gynecology, orthopedic surgery, general surgery and ophthalmology was drawn from the Naft grand hospital and oil and refineries health affairs department databases, southwestern region, Iran.

2.4. Measurements and Outcomes: We observed negative DM activities including increases in follow up, referral rate, and diagnostic testing, as well as prescription of unnecessary drugs among the high-risk medical specialties. Furthermore, a previously validated questionnaire was used [10, 12]. This survey included questions on defensive practices activities including: Physician demographics, patient demographics, physician practice, practitioner perceptions related to liability and practitioner behaviors in terms of ordering of laboratory tests and imaging studies. In an initial assessment, the survey was applied to a group of 30 high-risk medical practitioners, and took 150 minutes on average to complete.

2.5. Statistical analysis: All data were analyzed using SPSS 15.0 (SPSS Inc., Chicago, IL). A logistic regression model was conducted, that the outcome was practices defensive medicine by direct questioning. The independent variables

were included due to significant results in Univariate analyses. Predictor's variables were: age, gender, professional experience. All tests were two-sided and p-value less than 0.05 were considered statistically significant. The associations between similar variables from the 2011-2014 and 2014-2017 data were examined using odds ratios (ORs) with 95% confidence intervals.

3. RESULTS

Overall 30 physicians of 1600 from four high-risk specialties were selected. The demographic characteristics of selected physicians are given in table 1. DM was more prevalent among orthopedic surgeons (30%) and obstetrics and gynecologists (29%) (Figure 1). Trends of medical activities showed increasing and decreasing pattern in 2011-2014 and 2014-2017, respectively (Figures 2-5). The obstetrics and gynecology specialists were more likely increase referral rate (OR: 2.0, 95%CI: 0.457 – 8.74) and follow-up (OR: 2.0, 95%CI: 0.34 – 11.75) in 2011-2017 compared with other high-risk physicians (Table 2). While general surgeons (OR: 2.5, 95%CI: 0.44 – 13.9) and ophthalmologists (OR: 2.0, 95%CI: 0.34 – 11.75) were more likely increase diagnostic testing (Table 2).

4. DISCUSSION

This study marks the first report identifying DM among four medical specialties at high-risk of malpractice liability and its impact on healthcare delivery. Our study was limited to a certain area or to high risk specialists alone. Approximately 27% of physicians were routinely practicing defensive medicine, which are less than the reported prevalence of defensive medicine in USA (93%) [10], UK (75%) [5] and Australia (46%) [13]. Several studies have previously identified some medical specialties that are at high risk for malpractice litigation including: emergency Medicine, general Surgery, orthopedic Surgery, neurosurgery, obstetrics/gynecology, and radiology [10]. These specialties regularly practice

in the field that requires a rapid decision-making, thus liability secondary to the poorer outcomes is unavoidable [14]. Finocchiaro et al, has been reviewed the possible clinical governance implementation and continuous quality improvement on health care operators especially surgeons, and claimed that this is beneficial for patients, organization and the medical professionals [15]. The potential role of clinical governance implementation on hospital referral and health care quality in two main categories including improving quality and outcomes for patients, making health services more patient-centered, and referral inappropriateness, have been discussed formerly [16-18]. Our study also showed that after clinical governance implementation the trend of the negative DM activities was decreasing.

There not clear whether DM decreases or improves quality of care. In the present study, there were ordering diagnostic tests, referring patients to consultants, and hospitalizing patients unnecessarily. Although some diagnostic testing are not harmful, but invasive procedures such as computed tomography, may cause radiation exposure and serious adverse effects [19, 20]. The present study suggests physicians behave defensively when facing some patients who their medical condition may lead to malpractice liability. Thus liability may affect clinical decision-making and lead individual physicians to behave defensively [21, 22].

5. CONCLUSIONS

DM is not very prevalent in Iran. It is more prevalent among orthopedic surgeons and obstetrics and gynecologists. Although DM may lead to better quality care, but it is performing more unnecessary tests, consultants and hospitalization. This study showed that implementing clinical governance and hospital accreditation may lead to shift from negative to positive DM performance, which is beneficial for organization, medical professionals and patients. This study also should provoke researchers and

health service decision makers to study the effects of negative and positive DM on the patient's quality care. It is also important to find out how to minimize DM in terms of cost quality of care cost.

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Table 1: Demographic characteristics of selected physicians

Characteristic	Physicians (N = 30)
Specialty, No. (%)	
Obstetrics and gynecology	7 (23.3%)
Orthopedic surgery	10 (33.3%)
General surgery	8 (26.7%)
Ophthalmology	5 (16.7%)
Sex, No. (%)	
Male	18 (60%)
Female	12 (40%)
Age (Years), Mean ± SD	
Obstetrics and gynecology	41.4 ± 6.6
Orthopedic surgery	49.4 ± 5.8
General surgery	48.6 ± 7.5
Ophthalmology	45.2 ± 4.1
Clinical experience (Years), Mean ± SD	
Obstetrics and gynecology	8.29 ± 2.5
Orthopedic surgery	9.8 ± 3.1
General surgery	9.25 ± 3.1

Ophthalmology	8.8 ± 3.2
Doing Defensive medicine, No. (%)	
Yes	8 (26.7%)
No	22 (73.3%)

Figure 1: The percentage of high-risk physicians that agree and doing defensive medicine

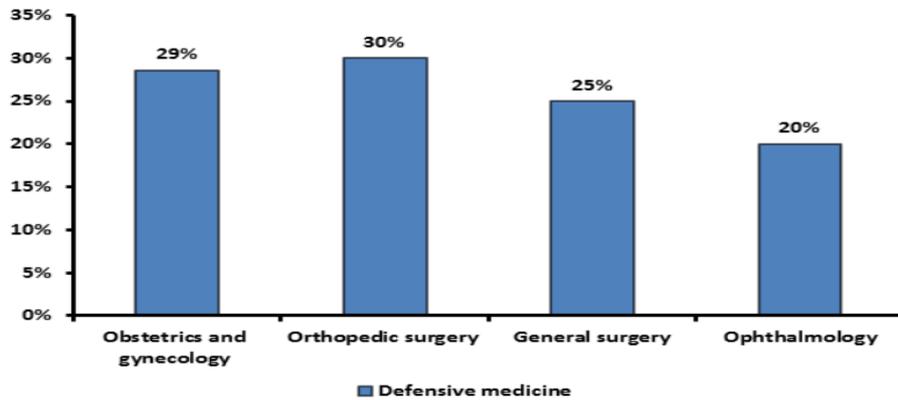


Figure 2: Trends of various negative defensive activities among five selected obstetrics and gynecology specialists; A, follow-up; B, diagnostic tests; C, number of referral rate; D, prescribed unnecessary drugs (Each line present one obstetrics and gynecology specialist)

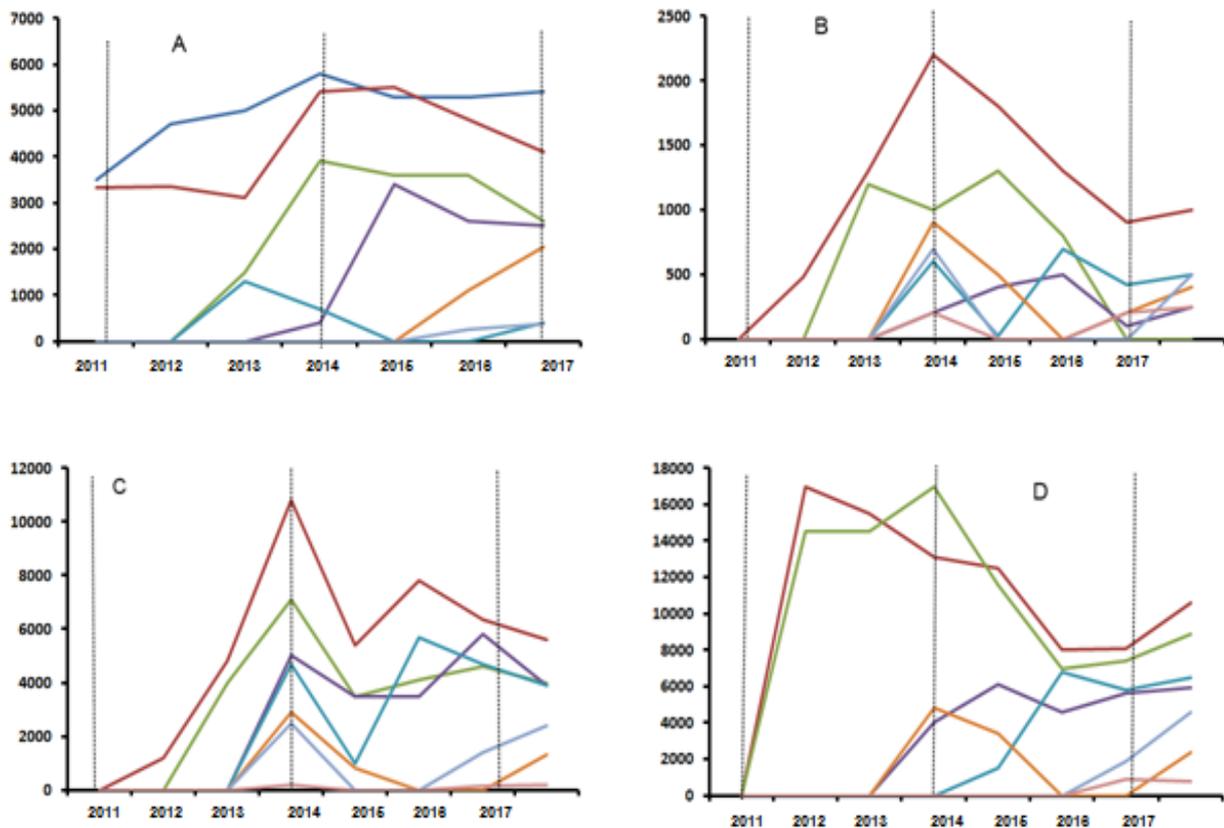


Figure 3: Trends of various negative defensive activities among four selected orthopedic surgery specialists; A, follow-up; B, diagnostic tests; C, number of referral rate; D, prescribed unnecessary drugs (Each line present one orthopedic surgery specialist)

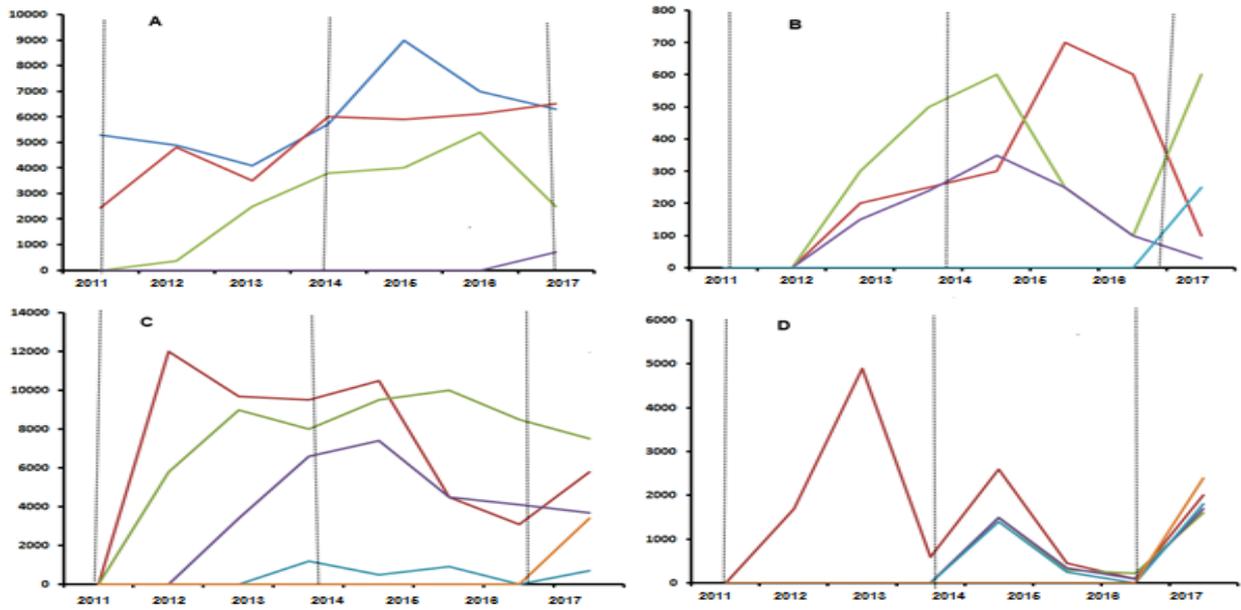


Figure 4: Trends of various negative defensive activities among five selected ophthalmology specialists; A, follow-up; B, diagnostic tests; C, number of referral rate; D, prescribed unnecessary drugs (Each line present one ophthalmology specialist)

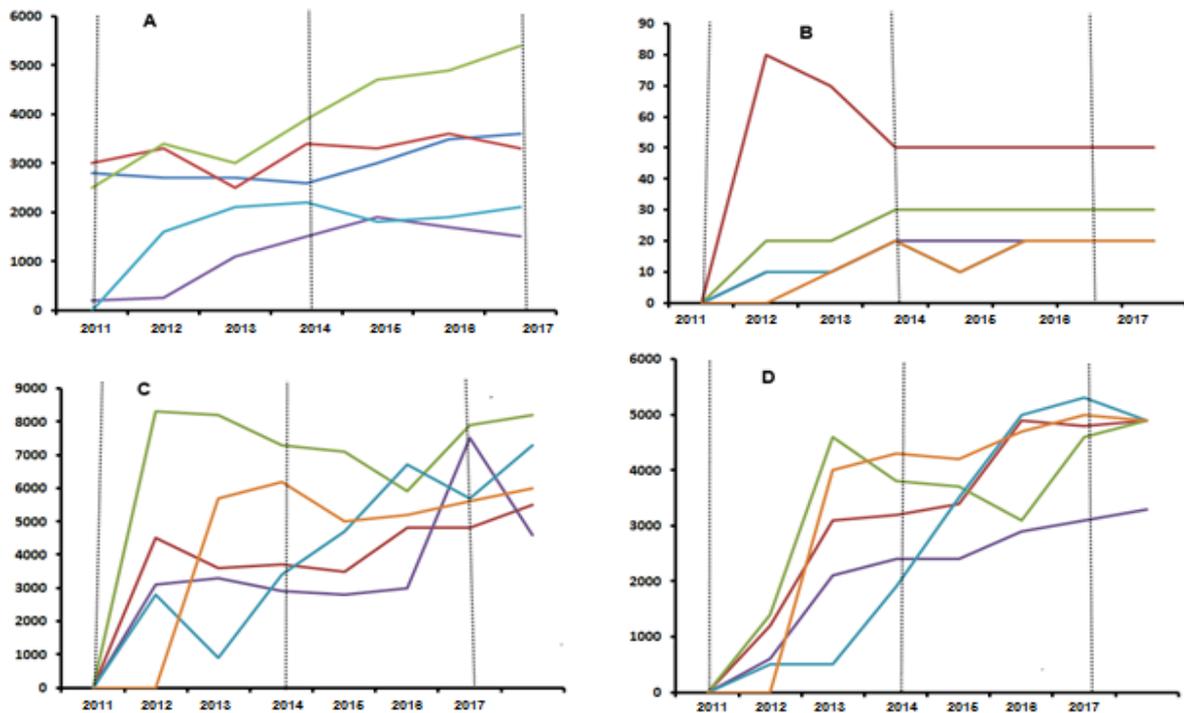


Figure 5: Trends of various negative defensive activities among five selected general surgery specialists; A, follow-up; B, diagnostic tests; C, number of referral rate; D, prescribed unnecessary drugs (Each line present one general surgery specialist)

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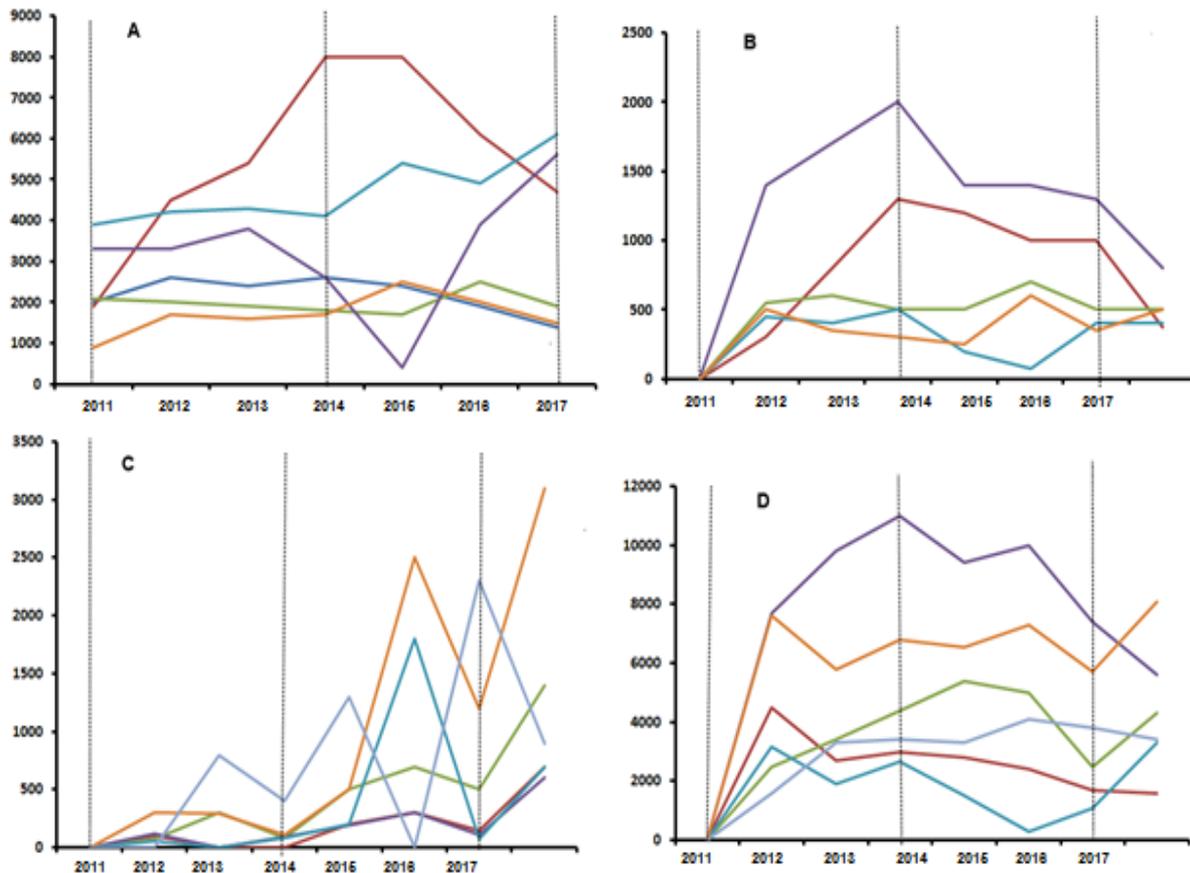


Table 2: Negative defensive medical practice during two periods: 2011 - 2014 and 2014 - 2017

Negative defensive medical practice	No. (%) of Physicians defensive behavior		Odds ratios (95%CI) comparing 2011-2014 with 2014 - 2017
	2011 - 2014	2014 - 2017	
Increased referral rate			
Obstetrics and gynecology	6 (20%)	3 (10%)	2 (0.457 – 8.74)
Orthopedic surgery	3 (10%)	2 (6.7%)	1.5 (0.234 – 9.63)
General surgery	3 (10%)	2 (6.7%)	1.5 (0.234 – 9.63)
Ophthalmology	2 (6.7%)	3 (10%)	0.66 (0.104 – 4.28)
Total	14 (46.7%)	10 (33.3%)	1.4 (0.538 – 3.64)
Increased follow-up			
Obstetrics and gynecology	4 (13.3%)	2 (6.7%)	2 (0.34 – 11.75)
Orthopedic surgery	1 (3.3%)	5 (16.67%)	0.2 (0.022 – 1.81)
General surgery	4 (13.3%)	5 (16.67%)	0.8 (0.196 – 3.27)
Ophthalmology	4 (13.3%)	4 (13.3%)	1 (0.22 – 4.37)
Total	13 (43.3%)	16 (53.3%)	0.81 (0.334 – 1.97)
Increased diagnostic testing			
Obstetrics and gynecology	4 (13.3%)	6 (20%)	0.66 (0.171 – 2.60)
Orthopedic surgery	3 (10%)	2 (6.7%)	1.5 (0.234 – 9.63)
General surgery	5 (16.67%)	2 (6.7%)	2.5 (0.449 – 13.90)

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Ophthalmology	4 (13.3%)	2 (6.7%)	2 (0.34 – 11.75)
Total	16 (53.3%)	12 (40%)	1.33 (0.540 – 3.29)
Prescription of unnecessary drugs			
Obstetrics and gynecology	4 (13.3%)	5 (16.67%)	0.8 (0.196 – 3.27)
Orthopedic surgery	4 (13.3%)	3 (10%)	1.33 (0.275 – 6.47)
General surgery	6 (20%)	3 (10%)	2 (0.457 – 8.74)
Ophthalmology	5 (16.67%)	4 (13.3%)	1.25 (0.306 – 5.11)
Total	19 (63.3%)	15 (50%)	1.26 (0.544 – 2.94)