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RESEARCH ARTICLE

PREVALENCE AND DETERMINANTS OF LOW BACK PAIN AMONG FAMILY MEDICINE RESIDENTS IN MAKKAH CITY, JANUARY 2020, A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Low back pain (LBP) appeared as one of the most critical problems between residents by its negative effect on life. We aimed in this research to measure the prevalence and determinants related to low back pain (LBP) between residents of the family medicine program in Makkah city, Saudi Arabia. **Aim of the study:** To assess the magnitude of low back pain and its risk factors to improve the family medicine resident's productivity and performance. **Method and Material:** This study was a cross-sectional study carried out between residents of the joint program of family medicine (JPFM) in Makkah city. Residents of different levels were randomly selected from the family medicine program, using a self-assessed questionnaire, which contained 37 items, the questionnaire was divided into three parts: demographic data, personal and occupational characteristics, and prevalence data. **Results:** This research results showed a prevalence of low back pain (LBP) and it was (76.4%). Investigated data of residents showed significance ($P < 0.05$) to job satisfaction, stress level, and prevention strategies. And showed non-significance ($P > 0.05$) to other dependents such as age, gender, smoking, stress level, and BMI. To relieve back pain many affected residents used painkillers and took rest as the best option. **Conclusion:** Results showed LBP has a high prevalence rate in family residents with many avoidable risk factors. **Recommendation:** This research further recommends that more studies, educational programs, and campaigns should be conducted to reduce the severity of the condition.

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INTRODUCTION

Low back pain can be defined as pain and discomfort usually appears in the area between the 12th rib and the inferior gluteal folds, and sometimes associated with leg pain.(1) Fast growing aging population showed high probability to non-communicable diseases (e.g., musculoskeletal complaints). Low back pain (LBP) observed as a major problem throughout the world in adults, musculoskeletal pain ranged from 65 to 85%, out of which 36 to 70% suffered from low back pain (2). LBP occurred as a major type of occupational injury.(3) LBP often lead to disability and badly affect the outcomes of daily activities. LBP is most reported musculoskeletal problem and its prevalence reported globally ranging from 15% to 45% among the overall population (4).

LBP lead individuals to sick leaves which impact on their job performance (5) There are many risk factors for low back pain and include increasing age, obesity, bad postures, lifting heavy objects, psychological conditions like depression and anxiety, smoking, lack of exercise, and other lifestyle factors.(6), (7). In general population LBP predominated in middle-aged groups, females, non-obese, tall individuals, and in individuals who were working for long hours. Prevalence of LBP gradually progressed from teenage to age of 60 years and gradually declined due to work exposure in different professions in adults. 65 years or above individuals were found as the second most common age group who visited physicians for lower back pain (LBP) and often resulted in dysfunction due to LBP.(8), (9). The impact of low back pain on individuals is huge, through its effects on productivity, quality of life and employee absenteeism. which makes LBP one of the most significant musculoskeletal disorders worldwide.(10)

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Low back pain can be classified to 3 categories: Acute (< 6 weeks), Subacute (6 to 12 weeks) and chronic (pain continues for more than 12 weeks) (11)

Majority of healthcare professionals has the risk of musculoskeletal disorders. physicians, nurses, laboratory workers and others are the risk groups among HCWs. And those are susceptible to frequent bending, awkward posture and lifting heavy objects throughout the work day (12)(13). Several studies have been carried out on the association between health care workers and common low back pain risk factors like age, height, high body mass index (BMI), smoking, working hours, and low job satisfaction which found a relation between them to have low back pain (3)(14)(15)(16) And the impact of this disease on HCW will affect their performance, productivity, treatment cost and work absence (13)(17)(18)

Rationale

- According to researcher experience, the exposure of family physicians to prolonged work hours while sitting can expose them to the risk of low back pain which may affect their productivity.
- researcher selected family medicine residents to conduct his research among them because they have an important role in primary health care centers (PHCC).
- The researcher chooses the program training center in Makkah To save time in catching up on the population as all.
- Up to the researcher's knowledge, a few previous studies about low back pain among family medicine residents in Saudi Arabia and specially in Makkah city.

Aim of the study: To assess the magnitude of low back pain and its risk factors to improve the family medicine resident's productivity and performance.

Objectives

- To measure the prevalence of low back pain among family medicine residents in Makkah city, 2020.
- To assess the risk factors of low back pain among family medicine residents in Makkah city, 2020.

METHODOLOGY

Study Design: This study is a cross-sectional study design.

Study Area: Makkah city family medicine program training center.

Study area profile: Makkah Al-Mukarramah is city located in western region of Saudi Arabia and has a population of 1.5 million people. It is where the Prophet Muhammad was born. Makkah Al-Mukarramah has the attention of Saudi government to improve and develop its infrastructure for both citizens and pilgrims' comfort.

Family medicine training program: The Family medicine program is four years post-graduate training program, the residents spend this period rotating in different hospitals (training centers) and exposing them to 13 different specialties.

Study Population: Makkah city family medicine program candidates who joined the program during the study period, January 2020.

Inclusion criteria

- Participants attend JPFM in Makkah city.
- Both genders (Male and female).
- All levels of training (R1, R2, R3, R4).
- Any age group.

Exclusion criteria

- Family medicine residents who do not attend the training center at the time of conducting the study.
- All family medicine residents who moved to another city and joined other family medicine programs.

Sample size

The joint program of family medicine (JPFM) in Makkah city has 162 family medicine residents (both males and females) in all levels of training. The desired sample number was calculated by using the Raosoft website (http://www.raosoft.com/sample_size.html), the recommended sample 115 residents to identify prevalence of LBP at 95% confidence level, 5% error estimation, and 50% study response distribution. Then to overcome number of the nonresponse and not completed questionnaires, 20% was added to the calculated sample size. So sample size become 148.

Sampling technique: According to the sample size previously calculated, the required sample was selected by a simple random technique. Each one of the candidates of this research was labeled with a number (1,2,3 ...).

Data collection tool: A self-directed questionnaire consist of 37 items was developed after studying and considering previous studies related to the subject of (low back pain) LBP in family residents, which was reviewed by two consultants for validation, and used to collect the information.

This questionnaire was based on three sections:

The first section was based on demographic characteristics; the second section was about work-related and personal characteristics that possess potential risk factors of LBP like job satisfaction, stress at work, and smoking. Furthermore, the exclusion criteria were placed in this section. The third section was molded to evaluate the occurrence of LBP characteristics as pain severity, frequency, management received, and preventive strategies used for LBP

Data Collection technique: Questionnaires were distributed Among the participants of the joint program of family medicine in Makkah during the month period of this study on every Tuesday, where the half-day release course (HDRC) is held. The number of residents attending HDRC was large, so they divided to four groups (A,B,C,D) and each group contains 40 participants. (A, B) attend in the morning while (C, D) attend at noon. The researcher distributed the questionnaires to the candidates, hand by hand during the first and second weeks at the beginning of each HDRC lecture and then he collected it back after they finished at the end of the lecture. If the targeted number of candidates was not achieved, the researcher did the same method over the next 2 weeks, until the desired number was completed.

Study variables

Dependent variables: LBP in family medicine residents.

Independent variables

- Age
- Gender
- BMI
- Physical activity level
- Level of residency.

Data entry and analysis: Statistics data were collected and encoded in Microsoft Excel 2019, after that it has been analyzed by using Statistical Package for the Social Sciences (IBM-SPSS) software version (24.0). The test that was used to identify statistical significance for this study was the Chi-squared test and considered significant when (P-value) was less than (0.05).

Pilot study: The pilot study will be conducted on 10 % of the population size among family medicine residents in Jeddah city which is not including in the study. Full methodology and analysis will be as the main study.

Ethical considerations:

- The researcher took the approval from the Research committee in the joint program of Family Medicine in Makkah.
- Written consent from all residents who participate in research.
- Acknowledgments of all supervisors, advisors, facilitators participants indicating their role in the research process.

Budget: Self-funded

RESULTS

This study has a total sample of 148 family medicine residents. The samples were collected from the targeted participants who were family medicine residents who joined the family medicine program during the study period of 2020 of all nationalities and all levels of residency in Makkah city. Out of 148 residents, 65(43.9%) residents were male and 83(56.1%) were female residents, R1 were 37 (25.0%), R2 were 38 (25.7%), R3 were 39 (26.4%) and R4 were only 34 (23.9%). Other demographic characteristics of the participated residents are summarized in Table 1.

Table 1. Characteristics features of residents (n=148)

Variables	n (%)
Gender	
Male	(43.9%)
Female	(56.1%)
Age	
≤30	(69.6%)
31 – 40	(30.4%)
Marital status	
Married	(48.6%)
Single	(51.4%)
Weight (in Kg) (\bar{x} ±SD)	69.39± 12.514
Height (in cm) (\bar{x} ±SD)	167.5±7.392
BMI (\bar{x} ±SD)	24.64±3.69
Years of practice	
≤ 5 years	(70.9%)
6-15 years	(29.1%)

\bar{x} : Mean, SD: Standard deviation,
BMI: Body mass index

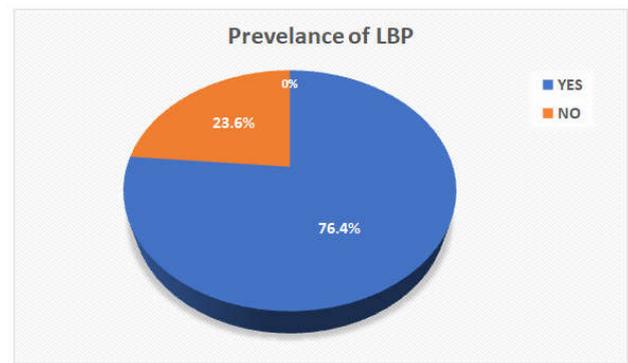


Figure 1. Prevalence of back pain Among FM residents

Table 2. Low back pain characteristics Among FM Residents (n=113)

Variables	n (%)
Duration	
Hours	(65.5%)
Days	(33.6%)
Weeks	(0.9%)
Continuous	(0%)
The pain usually the most	
At work	(29.2%)
Through the day	(70.8%)
Outside work	(0%)
Frequency	
Daily	(3.5%)
Once a week	(13.3%)
Once a month	(54.0%)
Once a year	(29.2%)
Severity	
Mild	(52.2%)
Moderate	(42.5%)
Severe	(5.3%)
Sick leave for LBP	
Yes	(11.5%)
No	(88.5%)
Sick Leave for how many times	
Once	(75%)
More than once	(25%)
First attack	
Before being a resident	(83.2%)
After being a resident	(16.8%)
Management	
Only rest	78(69%)
Medication	25(22.1%)
Physiotherapy±medications	10(8.8%)

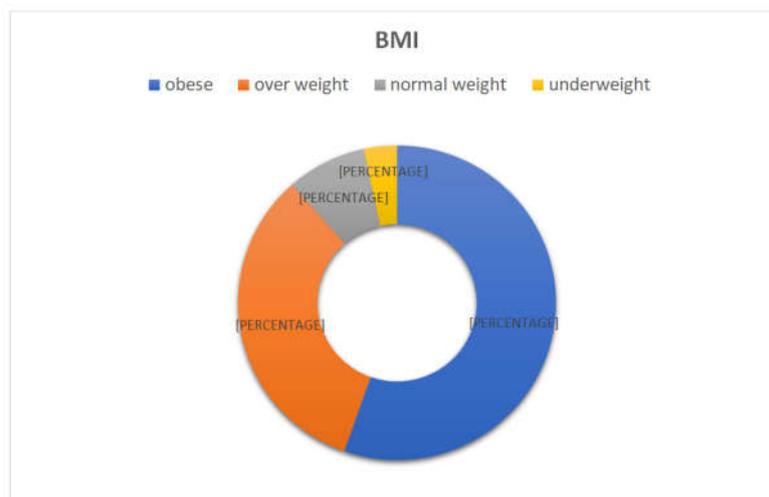
LBP: Low back pain

prevalence of LBP was more common in female than male residents; however, it was not statistically significant ($P = 0.807$). Age was not statistically significant ($P = 0.787$) to LBP prevalence between residents. Although Body mass index (BMI) shows that obesity 12 (92.3%) and overweight 38(77.5%) were more associated with candidate's LBP than who were normal or underweight (Figure 2), however, this was statistically insignificant ($P = 0.218$). Table 3 showed also that married residents were more affected, and it was not statistically significant ($P = 0.249$). Table 3 summarizes the Relation of the prevalence of LBP and occupational and personal characteristics of residents. LBP was predominant among R1 and R2 and that was statistically not significant ($P = 0.077$). Moreover, on other individual factors, for example, a smoking cigarette was correlated to LBP and found statistically not significant ($P = 0.232$), smokers were more affected (85.1%) than nonsmokers (78.38%). 70 (70%) candidates who do sport/exercise activities like weightlifting, walking, and running or any other activities found statistically not significant ($P = 0.085$).

Table 3. Association of low back pain prevalence with individual and occupational factors

	Number of totals= 148	LBP prevalence, n (%)	P	χ^2
Gender		49 (75.38%)	0.807	0.060
Male	113			
Female	35	64 (77.10%)		
Age				
≤30	103	78 (75.72)	0.787	0.073
31-40	45	35 (77.77)		
BMI Underweight (<18.5)	5	5 (100%)	0.081	4.431
Normal weight (18.5-24.9)	82	58 (71.7%)		
Overweight (25-29.9)	49	38 (77.6%)		
Obese (>30)	12	12 (100%)		
Residency Level R1	37	32 (86.48)	0.077	6.857
R2	38	32 (86.48)		
R3	39	26 (66.66)		
R4	34	23 (67.64)		
Job satisfaction No	8	8 (100)	0.000*	23.670
Low	41	37 (90.24)		
Moderate	73	57 (78.08)		
High	26	11 (42.30)		
Years of practice ≤ 5 years	105	79 (75.23)	0.830	0.372
6-15 years	43	34 (79.06)		
Level of stress Mild	65	45 (69.23)	0.239	4.217
Moderate	78	63 (80.76)		
Severe	4	4 (100)		
Very severe	1	1 (100)		
Do you smoke?		23 (85.18)	0.232	1.427
Yes	27			
No	121	90 (78.38)		
Overall standing time in a workday				
< 25%	58	43 (74.13)	0.618	0.248
25% - 50%	79	61 (77.21)		
50% - 75%	11	9 (81.81)		
Do you have any Sport/exercise activities?				
Yes	70	49 (70.00)	0.085	2.967
No	78	64 (82.05)		

*Statistically significant.

**Figure 2. Body Mass Index among Family medicine Residents****Table 4. Association of low back pain prevalence with different preventive strategies**

Preventive strategies	Number of totals=148	LBP prevalence	P	χ^2
LBP: Low back pain		Yes, n (%)	No, n (%)	
Stand straight with your shoulders back	31	25(80.6%)	6(19.4%)	.000*
Sit straight and avoid slouching	57	45(78.9%)	12(21.1%)	.400
Use good and comfortable shoes	104	73(70.2%)	31(29.8%)	
Exercise and stretching	63	43(68.3%)	20(31.7%)	
Healthy diet	65	30(54.5%)	25(45.5%)	
Sleep on your sides	63	52(82.5%)	11(17.5%)	
Sleep on a firm mattress	51	38(74.5%)	13(25.5%)	
None	12	11(91.7%)	1(8.3%)	

*Statistically significant. LBP: Low back pain

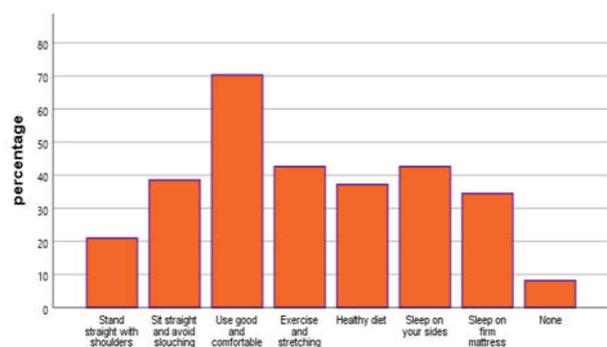


Figure 3. Association of low back pain prevalence with different preventive strategies

Although residents who usually worked 6- 8 hours per day were more affected, this was statistically not significant ($P = 0.085$). In a working day, general standing time was related to LBP and it was statistically not significant ($P = 0.618$) and those who stand 50% - 75% of the day appear to be more affected. Table 3 shows that as increasing of the level of stress on residents would lead to being affected with LBP, and that was statistically not significant (0.238), candidates who have experience of 5 or more than five years appeared to be more affected (75.23%) even, however, it was not statistically significant ($P = 0.830$). different strategies for prevention used by residents and their link with LBP, despite that 78 of the residents did not use any of the strategies, they only managed LBP with rest and 35(23.6%) of them did not experience LBP, that was a statistically significant ($P \leq 0.001$), as using shoes of comfortable quality was associated with the lowest incidence of LBP followed by the other protective strategies showed in Table 4.

DISCUSSION

There is not enough studies that have assessed LBP prevalence and identified its risk factors among family medicine residents, despite many other low back pain researches were carried out between residents of deferent specialties and other HCWs. So this research aimed to evaluate the prevalence of LBP and identify its determinants between residents' training in the family medicine program Makkah. This current research showed an overall prevalence of the lower back pain prevalence was 76.4, which was similar to another study, conducted between residents who work at King Abdelaziz Medical City, Saudi Arabia.(13) Similar statistics have been found from other two reported studies that were conducted in Saudi Arabia carried out recently in the Eastern Region, Riyadh(19)(20) and not exceeded other worldwide frequencies of LBP in the systems of healthcare settings. Also, In the present study, revealed several significant relations between the prevalence of LBP and different risk factors and personal and occupational characteristics that have been examined such as job satisfaction, and using different preventive strategies. Meanwhile, gender, age, BMI, and working hours per day were not statistically significant. Our study showed no significant difference between male and female residents who had LBP, As many other studies reported no significant association between Type of gender and LBP (3)(21) However there is a study among physicians Saudi Arabia showed a significant difference between gender and LBP; males were found to have high prevalence than females, and this could be due to the smaller sample size of females.

(22)(23) advancing age was found to be associated with LBP in different studies between healthcare workers and even the general population with or without a statistical significance. In the present study, there was no significant correlation between age and LBP (21) In this research, BMI was also found as a determinant of LBP as overweight (BMI >25), and obese (BMI >30) residents were more affected even though it was found not statistically significant, as in many previous studies were not significant, while Other studies showed a clear correlation between LBP and BMI.(16). Job satisfaction also has been investigated in this study and it was significantly associated with low back pain as most of the candidates reported that they were had low (90.2%) and moderate (78%) job satisfaction with high prevalence in those who have low job satisfaction. This result is in agreement with the findings with other studies, as they reported physicians and other healthcare workers who had low Job satisfaction are at a high chance to have LBP.(24)(25)(26). In addition, we have found that residents who are smokers, or they are having severe stress at work, and were standing >75% of a workday were more affected by LBP with no significant association. Also, long working hours in other researchers are associated with increased back pain risk between physicians.(13)(16) but in our study, there was no significant association. The present study showed The majority of residents who had low back pain 78(69%) were dealing with their complaint only by rest, 25(22.1%) of affected residents used painkillers, while only 10(8.8%) undergo for physiotherapy besides painkillers to treat LBP. According to this research, 11.5% of residents who complained of LBP applied for sick leave, 75% of them got sick leave at least once. Likewise, in other researches carried out in Riyadh and Tabuk among physicians and HCWs showed that 13% and 15 %, respectively, had taken leaves from work for their pain . In Malaysia, 7.3% of physicians applied for leaves from work due to LBP. This research also investigated some strategies used by residents to prevent LBP from happening (Figure 3), and was found a significant association between those preventive strategies and LBP; and the majority of participants were using good comfortable shoes and it was most effective strategy, followed by a healthy diet, exercise and stretching, and sleep on the side. And these results agree with several other studies.

Conclusion

We conclude from this study that family medicine residents in Makkah are exposed to a high prevalence of low back pain, and identified some risk factors that associated with an increased incidence of LBP. It is recommended to raise awareness between residents by or organizing educational and safety programs about lower back pain and how to prevent it from happening. Further studies are required including residents from other training programs in the kingdom is recommended to better understand the determinant factors for this problem.

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