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Original Research

Association between Body Mass Index and Back Pain in Mosul City: A descriptive study

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Abstract:

Background: Low back pain is one of the most common medical diagnoses in children and adolescents as well as in adults. The actual prevalence of low back pain for children, adolescents, and young adults is still a controversial issue

Material and method: This study was conducted in a cohort of 200 adult patients who visited the pain management clinic with chronic LBP in hospital. A retrospective observational studyPatient data were retrieved from the hospital software program PMCS (Pain Management Clinic System) and recorded in a pre-designed preform for a period from 1st November 2023 to 31st May 2024.

Results: The study shows after collecting data from patients suffering of back pain that most of sample (23.5%) at age group (50-59) years.

Conclusions: The study concluded that the most percentage of BMI classification they were at first stage obesity. High significant relationship between BMI classification and back pain measurement and highest percentage of patient were at age group (50-59), female, rural area, non-smoker, less or secondary education.

Keywords: Association, Body Mass Index, Back Pain

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Introduction:

Low back pain is one of the most common medical diagnoses in children and adolescents as well as in adults. The actual prevalence of low back pain for children, adolescents, and young adults is still a controversial issue (Frosch et al., 2022).Large population studies in World, for instance, have consistently demonstrated a link between obesity and chronic low back pain (Williams et al., 2023), and two independent and well-conducted surveys each found that obese individuals with a body mass index (BMI) >30 are 1.7 times more likely to develop disabling back pain compared to healthy weight individuals (Almulhem, 2022).Low back pain occurs in every

population worldwide and has serious socioeconomic consequences (Chen et al., 2022). Low back pain may affect daily function, diminish the quality of life, result in lost wages, increase health-care costs, and lead to psychological distress (Wettstein et al., 2019). The diagnosis of low back pain relies mainly on the patient's reported symptoms, because the results of physical examinations and imaging studies are often normal (Resorlu, 2023).Body mass index (BMI) (measured as weight (kg)/height (m2) and body height have been suggested as contributing to the pathogenesis of low back pain, but evidence-based confirmation of their possible roles is lacking(Nitecki et al., 2023). Increased mechanical demands resulting from obesity have also been suspected of causing low back pain through excessive load bearing (Nieminen et al., 2021).Regular exercise participation is a primary prevention against more than 35 chronic conditions including obesity and joint pain, and reduces mortality risks independent of weight loss (Anderson & Durstine, 2019).Although disc degeneration is predominantly a condition affecting adults, disc alterations have also been noted, although less commonly, in young individuals (Ambrosio et al., 2023).The purpose of this study is to examine the inter-relationship between physical activity, obesity and low back pain using the 2003-2004 National Health and Nutrition Examination Survey. Specifically, this study seeks to determine if obesity is a risk factor for back pain. population, measure the strength of any observed association, and evaluate the role of physical activity in modulating this association.

Methods and Materials:

This study was conducted in a cohort of 200 adult patients who visited the pain management clinic with chronic LBP in hospital.

Study design: A retrospective observational studyPatient data were retrieved from the hospital software program PMCS (Pain Management Clinic System) and recorded in a pre-designed preform for a period from 1st November 2023 to 31st May 2024.

Inclusion and exclusion criteria:

All adult patients of either gender presenting to the pain management clinic of Hospital with a history of chronic LBP for more than 3 months were included. Patients with missing data and follow-up patients were excluded from the study. All patients were included in this retrospective observational study by reviewing data in the electronic medical record, PMCS by one of the authors as per the availability. The patients' medical records were also reviewed for any additional information and all the information were recorded in a pre-designed preform. The data included the patient's age, gender, weight, height, BMI, comorbidities, site of pain, duration of pain, distribution of pain, Osteoporosis, Sedentary lifestyle, and Juvenile disc degeneration. BMI is categorized as; underweight (BMI < 18.5 kg.m2), normal weight (BMI 18.5 to 24.9 kg.m2), overweight (BMI 25 to 29.9 kg.m2), obesity (BMI 30 to 39.9 kg.m2), morbid obesity (BMI 40 to 49.9 kg.m2), and super obesity 50 to 59.9 kg.m2.

Statistical analyses:

Statistical analyses were performed using Statistical Packages for Social Science version 19 (SPSS Inc., Chicago, IL). Mean and standard deviation was computed for quantitative variables while frequency and percentage were estimated for qualitative variables. A P-value of ≤ 0.05 was considered significant.

Sample collection method:

Data was collected four days per week during normal business hours (9:30 a.m.–1 p.m.). Each patient was interviewed for 15 to 25 minutes in order to complete the questionnaire in the Ibn Sina Hospital consultation. Data was collected between the 1st of November, 2023 and the 31st of May, 2024. The length of the patient is measured using a tape or stadiometers measure of height and weight using a scale for 10 minutes, and then the patient is examined by the doctor and a medical diagnosis is taken to determine the back pain and what the effect of the back pain of the patient, after which the consent is obtained to fill out the

questionnaire and the duration of each into boys and girls, standard for calculating BMI for age, Standard scales and standardized stadiometers were used to measure height and weight. The body mass index (BMI) was calculated using the formula BMI=Weight (kg) / Height (m)2. Growth patterns were diagnosed using WHO criteria or a WHO-approved program for anthropometric measurement to measure growth patterns and determine the rate of obesity or normal growth rate in patient. The Oswestry Disability Index (ODI) is a widely used questionnaire designed to assess the degree of disability and functional impairment in individuals with lower back pain. It measures how back pain impacts various activities of daily living. The ODI consists of 10 sections, each with 6 statements (scored 0 to 5), covering the following areas (Section 1—Pain intensity, Section2 Personal care, Section 3—Lifting, Section 4—Walking, Section 5—Sitting, Section 6—Standing, Section 7—Sleeping, Section 8—Sex life, Section 9—Social life, Section 10—Travelling) after collecting the score we divided it with 2 to decelerate the final result.

The following degree of disability of back pain from (ODI) questionnaire:

0-20%: Minimal disability

21-40%: Moderate disability

41-60%: Severe disability

61-80%: Crippling back pain

81-100%: These patients are either bed-bound or exaggerating their symptoms.

Then, Excel and SPSS version 25 were used to analyze the data, which included descriptive and inferential statistical analysis. The total sample size was 600 sample from hospital. The current study's data is analyzed with SPSS version 25 (Statistical Package for Social Sciences). The following statistical data analysis approaches are used to analyze and evaluate the study's findings. Frequencies and percentages are used to estimate the description of demographic data. The mean and standard deviation are used to approximate the data value. The Pearson coefficient correlation (r-test) was used to determine the relationship between variables. For testing relationships between categorical variables, the Chi-square statistic is commonly used. When the p-value is ≤ 0.05, it is considered significant; when it is > 0.05, it is considered non-significant, 0.00 it is considered high significant.

Results:

Table (1): The Demographic Characteristics of the study population about back pain

Items	**Categories**	**requency**	**Percent**
Age	20-29y	28	14.0
	30-39y	46	23.0
	40-49y	40	20.0
	50-59y	47	23.5
	more than 60	39	19.5
	Total	200	100.0
Gender	Male	61	30.5
	Female	139	69.5
	Total	200	100.0
residental area	Urban	98	49.0

	sub urban	76	38.0
	Rural	26	13.0
	Total	200	100.0
smoking status	occasional smoker	49	24.5
	Non-smoker	151	75.5
	Total	200	100.0
education	secondary education or less	125	62.5
	post-secondary education	75	37.5
	Total	200	100.0

Table 2 / the study Distribution of metabolic syndrome for Patients with Back Pain

Items	Categories	Frequency	Percent
Diabetes type 2	yes	48	24.0
	no	152	76.0
	Total	200	100.0
Hypertension	yes	63	31.5
	no	137	68.5
	Total	200	100.0

Table 3 /the study Distribution of Body Mass Index for Patients with Back Pain

BMI Classification	Frequency	Percent
Normal	17	8.5
Over weight	55	27.5
first stage obesity	58	29.0
second stage obesity	52	26.0
third stage obesity	18	9.0
Total	200	100.0

Table 4 / Relationship between Distribution of Body Mass Index for Patients (BMI) Classification and back pain measurement according to Oswestry Disability Index

Items	Moderate disability	Severe disability	Crippling back pain	These patients are either bed-bound or exaggerating their symptoms.	total	Chi – square	df	P-value
Normal	0	8	6	3	17	38.887[a]	12	0.000
Over weight	5	31	16	3	55			
first stage obesity	6	24	25	3	58			
second stage obesity	5	20	27	0	52			
third stage obesity	1	4	6	7	18			
Total	17	87	80	16	200			

df (degree of freedom)

Discussion:

The statistic shows after collecting data from patients suffering of back pain that most of sample (23.5%) at age group (50-59) years as in table (1). This may be considering to decrease metabolism rate at this age and decrease level of exercise. this finding approves with Park et al., (2018) showed the high percent of patient was between (50-59). Regarding patients gender, the statistics shows more than half of patients (69.5%) were female (table, 1). This may be considering that the women bone density is more prone to osteoporosis this may lead to chronic back pain. this finding approves with DUAL-ENERGY, S. I. B. O., & ULTRASOUNDMEASUREMENTS, Q. (2017) showed that women are more susceptible to Musculoskeletal Diseases. As far as place of residence is concerned, (49.0%) of the patients were living in an urban area regarding table (1). From the researcher's point of view, this is related to many risk factors that cause back pain associated with the daily lifestyle patients who live in urban areas. This finding approve with Chow et al., (2013) that high percentage of patient were living in urban areas they suffering from hypertension. Regarding educational level in table (1), the statistics shows more than one quarter of patients have secondary education or less (62.5%). This finding approve with Kuśmierek et al., (2024) finding, in their study that Low back pain prevention behaviours and beliefs among the Polish population in a cross-sectional survey.The data analysis shows that metabolic syndrome for Patients with Back Pain in table (2) scored the high percentage of them scored (76.0%) they did not have diabetic type2. While more than half percentage (68.5%) they didn't hypertension. The finding of the study consists with the researchers Al Hayek et al., (2014) whom stated in their study about Factors associated with health-related quality of life among Saudi patients with type 2 diabetes mellitus: a cross-sectional survey. The data analysis shows the high percent (29.5%), (58) first stage obesity as in table(3) The finding of the study consists with the researchers Oh, et al.,

(2022) finding in their study in Korea about Association between Fat distribution and chronic low back Pain among 10,606 adults: data from the Korean National Health and Nutrition Examination Survey. Finally, the statistical correlate between the Body Mass Index (BMI) Classification and back pain measurement in table (4), the statistics shows the high frequency according to (BMI) was first stage obesity (58) and according to back pain measurements was severe disability (87), with Chi –square (38.887a (, df (12), P- value (0.000) considered high significance. The findings of the study supported by Lucha-López et al., (2023) in their research at Spain about Body Mass Index and Its Influence on Chronic Low Back Pain. Additionally, the researchers Varallo et al., (2020) finding in their study in Italia about The association of kinesiophobia and pain catastrophizing with pain-related disability and pain intensity in obesity and chronic lower-back pain.

Conclusions:

The study concluded that the most percentage of BMI classification they were at first stage obesity. High significant relationship between BMI classification and back pain measurement and highest percentage of patient were at age group (50-59), female, rural area, non-smoker, less or secondary education.

Recommendations:

The study recommended that the Exercise activity important in backache management. Body weight control should be adopted in backache management Control of chronic disease decreases incidence of backache.

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