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Assessment of Prediabetes among Iraqi Adults in Al-Najaf: Prevalence and Associated Risk Factors

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ABSTRACT

The global prevalence of prediabetes is an alarming trend noted by researchers and health organizations worldwide. Diagnosing prediabetes is challenging and in 90% of cases, prediabetes is discovered incidentally. Studies conducted in various countries show that 5-10% of people with prediabetes develop diabetes each year In Iraq, according to previous Iraqi studies, the number of Iraqi people with Prediabetes are annually increases, hence we conducted this cross-sectional study to assess the prevalence of prediabetes among Iraqi people who were apparently healthy with no any clinical evidence of DM and to identify the predictors of prediabetes. The study included 432 apparently healthy people who were visiting two main primary healthcare centers (PHCCs) and one main Teaching hospital. Our findings revealed that the prevalence of prediabetes was 19.4% and the rate was significantly increased with advancing age, prediabetes was significantly more frequent in males, (24.9%), compared to (15.7%) in females. Prediabetes was significantly more frequent in people with lower level of education, (35%) in illiterate participants, in all comparisons, (P <0.05). Prediabetes was associated with higher systolic and diastolic blood pressure, (P<0.001), prediabetes was significantly associated with higher body mass index (BMI), (P<0.001). Smoking was significant predictor of prediabetes (P=0.034). Regression analysis and odds ratio values revealed that higher BMI and older age were the stronger predictors followed by male gender, smoking, SBP and DBP, (P<0.05). In conclusion, prediabetes is frequently reported among Iraqi individuals in Najaf and the prevalence was close to that reported in previous Iraqi studies. Higher BMI , older age, male gender, smoking, SBP and DBP and lower level of education were predictors and risk factors for prediabetes.

***Keywords**: Prediabetes, prevalence, risk factors, Iraqi Adults, Al-Najaf*

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INTRODUCTION:

Diabetes Mellitus (DM) is considered a major public health problem, given the progressive increase in its incidence worldwide in recent years. According to 2021 estimates, DM affects almost 537 million people worldwide, and it was estimated to rise to almost 783 million by 2045 [1].Type 2 DM represents up to 95% of the burden of DM. Therefore, currently, diabetes has become a global public health problem, given the high morbidity and mortality associated with the disease. In this context, one of the priority concerns is to try to prevent and/or delay the onset of its associated complications [2]. Type 2 Diabetes Mellitus is a disease characterized by an asymptomatic phase that typically occurs between mild hyperglycemia and clinical diagnosis. This phase leads to the development of serious chronic complications in various body systems, which can occur if the diabetes is not controlled. The mechanisms by which diabetes leads to complications are not yet fully understood [3]. However, the high prevalence of chronic complications of DM, particularly, the cardiovascular events, highlight the need for robust and rigorous glycemic control as well as modifying the modifiable risk factors in order to reduce the incidence of these complication [4]. The main chronic complications of DM can be divided into microvascular, such as diabetic nephropathy, and macrovascular, such as atherosclerotic disease [3]. Type 2 DM is diagnosed when fasting blood glucose is greater than 126 mg/dL, or when random glucose exceeds 200 mg/dL. These diagnostic criteria were established by the ADA (1997) and the WHO (1999), after verifying that these values are strongly associated with an increased incidence of microvascular lesions. Regarding prediabetes, it is diagnosed when fasting blood glucose is greater than or equal to 100 mg/dL and less than 126 mg/dL, presenting with impaired fasting glucose[5,6]. In addition to measuring blood glucose there are other diagnostic criteria, such as the oral glucose tolerance test (OGTT). This test allows the diagnosis of pre-diabetics who present with blood glucose greater than or equal to 140 mg/dl and less than 200 mg/dl (postprandial hyperglycemia), that is, those who have impaired glucose tolerance (IGT) [6,7]. Prediabetes is a condition that precedes the onset of DM, it represents an intermediate stage between normal glucose regulation/metabolism and T2DM [8]. Prediabetes is characterized by altered glucose metabolism, including impaired glucose tolerance (IGT) and/or impaired fasting

glucose (IFG). Currently, prediabetes is diagnosed using IGT between 140-199 mg/dl, 2 hours after oral glucose administration, impaired fasting glucose (IFG), defined as a plasma glucose concentration between 100 and 125 mg/dl in a fasting sample, or a glycated hemoglobin (HbA1c) levels [5]. In this context, the global estimates referred that almost 320 million adult people have IGG and 540 million with IGT [1]. Several studies have showed that Prediabetes is increasing rapidly and the annual rate of progression of IGT and IFG to type 2 diabetes is up to 5-10%, and the highest risk of progression to T2DM was significantly increased up to 15% when IGT and IFG overlapped [9]. Although, the risk of progression to T2DM is not similar for IGT or IFG alone, but is much higher when combined [10]. Preventing prediabetes is therefore the most effective way to avoid the consequences of diabetes and its associated cardiovascular disease. Several risk factors contribute to the development of DM and these risk factors are shared between Prediabetes and T2DM, however, the greater the number of these risk factors, the greater the risk of developing the disease and multiple risk factors act synergistically [11]. The risk factors are classified into two main categories; the modifiable and non-modifiable, the latter are those that cannot be acted upon, modified, or treated and are related to an individual's age, sex, genetic inheritance, ethnicity, and family history. Modifiable factors include obesity, sedentary lifestyle, hypertension, smoking, dyslipidemia, alcohol consumption, poor sleep or sleep apnea and stress [12]. The diagnostic criteria for Diabetes Mellitus and Prediabetes are summarized below

Diagnostic criteria for Diabetes Mellitus and Prediabetes [6,7]

Criteria	Prediabetes	Diabetes
Fasting blood glucose	**≥100 mg/dl and <126 mg/dl**	**≥ 126 mg/dl**
Blood glucose in the OGTT with 75g of glucose.	**>140 mg/dl and <200 mg/dl**	**≥ 200 mg/dl**

Formulated by the authors based on the criteria reported in [6,7]

OGTT: oral glucose tolerance test

However, in addition to these tests, there is also glycosylated hemoglobin (HbA1c), which depends on the concentration of glucose in the blood to which red blood cells are exposed during their lifespan; that is, it indicates the average blood glucose level to which hemoglobin has been exposed in the last 3-4 months [7].

The HbA1c measurement is not widely used in the diagnosis of diabetes, but rather for monitoring therapy. The ADA and IDF have accepted that HbA1c may be an alternative for screening for the disease and recommend that an HbA1c value greater than 6.5% be included as a diagnostic criterion [10,13]

In Iraq, there is an increase in the prevalence of risk factors of chronic diseases, particularly those associated with DM and there is steady increasing in the incidence of DM and the number of Iraqi people with Prediabetes are annually increases, therefore, there is a need to conducting studies and estimating the prevalence of Prediabetes and its associated factors and to suggest recommended measures for prevention and control of Prediabetes and to reduce or prevent its progression to DM. These points represent the rational to conduct our study.

PATIENTS AND METHODS:

This was a cross-sectional study conducted in Al-Najaf city during the period April,2025 to May 2026. For this study, apparently healthy, adult Iraqi individuals who visited two selected primary healthcare centers (PHCs) and Al-Najaf Teaching Hospital in Al-Najaf city and underwent fasting blood glucose testing and/or HbA1c. The total individuals who were surveyed was 468 individuals and they were sequentially selected using a non-probabilistic sampling method; however, 36 individuals were excluded because they confirmed to have T2DM and they were referred to consult a diabetologist at Al-Sader Teaching Hospital in Al-Najaf. The net sample was 432 participants (177 males and 255 females).

This study included demographic variables; age, sex, marital status, level of education occupation, residence as well as the anthropometric measurements and the determination of fasting or random FBG/ RBG and some biochemical parameters when available.

Inclusion criteria:

1. Apparently healthy Iraqi adults residing in Al-Najaf province
2. Aged 20 years and older
3. Both genders
4. Able to undergo laboratory investigations

Exclusion criteria

1. Known case of DM (type 1 or 2)
2. Pregnant woman
3. Taking medications that affect blood glucose levels such as corticosteroids
4. Using immunosuppressant medications during the past 6 months
5. History of autoimmune disease, hematological disorders or hemoglobinopathies
6. Refused to participate in the study or conducting the laboratory investigations

All the participants signed an informed consent form that explain the study's objectives, and illustrative information about DM and Prediabetes and its complications.

All participants underwent fasting blood glucose testing. After this phase, only the volunteers classified as pre-diabetic (66) were suggested to undergo OGTT to confirm the diagnosis. However, it was not possible to perform the test on all participants due to logistical issues, as not all of them wished to take the test.

Anthropometric Parameters and Blood Pressure:

Body weight and height were measured using anthropometric scale that was calibrated before use and the standard measurement methods were followed. Body mass index (BMI) was calculated by dividing weight, in kilograms, by the square of height, in meters, using the standard BMI equation as

BMI= Weight (kg)/ height (m^2).

Normal BMI levels, overweight, and obesity were based on the reference values of the WHO and classified as normal weight when BMI 18.5 - 25 kg/m^2, overweight when BMI 25-29.9 kg/m^2 , and obese when BMI ≥ 30 kg/ m^2 .

Blood pressure (BP) was assessed using an electronic sphygmomanometer. Two measurements were taken, the first after the participant had been seated for a few minutes and the second 5 minutes later. The arithmetic mean of the two values obtained was

calculated, which served as the definitive value for systolic (SBP) and diastolic (DBP) blood pressure. Individuals with a systolic blood pressure (SBP) greater than 140 mmHg and/or a diastolic blood pressure (DBP) greater than 90 mmHg were considered hypertensive and referred to consult internal medicine specialist.

Blood samples were collected in the laboratory under fully sterile conditions and antiseptic techniques

Statistical analysis:

Data were managed and analyzed using the statistical package for social sciences (SPSS) version 28 for windows. Scale variables were presented as mean and standard deviation whereas categorical (qualitative) variables as frequencies and percentages. Independent two groups t test used to compare mean values of a scale variable between Prediabetes and no Prediabetes groups. Chi-square test used to compare categorical variables. All statistical tests were performed at a two-tailed level of significance of ≤ 0.05 to be considered as statistically significant difference or association.

RESULTS:

In this study the total number of participants was 432 after excluding the participants who were appeared to be newly diagnosed and proved to have DM. The mean age of the studied group was 44.3 ± 13.9 (Range: 20-72) years. Females were relatively dominant and contributed for 59% of the studied group, most the study population, 86.6%, were married. Among the 432 participants, 64.1% had secondary or higher level of education, 57.9% were unemployed, 25.5% were current smokers, 47.5% with normal body mass index (BMI: 18.5-24.9 kg/m^2), 30.3% were overweight (BMI: 25 – 29.9 Kg/m^2), and 22.2% were obese (BMI: ≥ 30 kg/m^2). All these findings are summarized in (**Table 1**).

The mean, standard deviation and range values of clinical parameters (systolic and diastolic blood pressure), fasting blood glucose, random blood glucose (RBG) and glycated hemoglobin (HbA1c) are shown in (**Table 2**).

To find the prevalence of prediabetes among the 432 study participants, the total number of participants who met the prediabetes definition criteria was divided by the total number of

participants and the prevalence was stated as the proportion of prediabetic participants; they were 84 participants producing a prevalence of 19.4%, (**Figure 1**).

To assess the relationship between prediabetes status and socio-demographic variables, cross-tabulation was conducted which revealed that older age was significantly associated with prediabetes where in prediabetes group (n=84), 72.6% were older than 45 years compared to 38.5% in non-prediabetic individuals, on the other hand, the mean age of prediabetes individuals was significantly higher than that in non-prediabetes group where the mean age was (50.8 ± 12.1) and (42.7 ± 13.9) years, , respectively. The results showed a statistically significant association between male gender and prediabetes, where males had significantly higher odds of prediabetes compared to females (OR = 1.78, 95% CI: 1.10-2.87, P. value=0.027). Level of education was also significantly associated with prediabetes where the prevalence of prediabetes varied across the levels of education, the highest proportion of prediabetes, 35%, was found among illiterate participants, while participants with primary, secondary and university levels showed lower proportions of prediabetes (17.9%, 16.4% and 17%, , respectively) and they were not significantly different to each other, this indicated a potential association between lower level of education and increased likelihood of prediabetes. Neither marital status nor occupation showed significant association with prediabetes , in both variables, (P. value >0.05, not significant), All these findings are summarized in (**Table 3**).

Comparison of clinical and biochemical parameters according to prediabetes status of the study population revealed that prediabetes group had significantly higher systolic and diastolic blood pressure, fasting blood glucose and HbA1c level compared to non-prediabetes group, in all comparisons, (P. value <0.05, significant), (**Table 4**).

Regarding the BMI, there was a clear significant association between BMI and prediabetes, (P. value <0.05, significant); where the prevalence of prediabetes increased significantly with higher BMI, in participants with normal BMI prediabetes reported in 11.7% compared to 23.7% among overweight and 30.2% among obese individuals, this finding indicated that overweight and obese individuals were substantially more likely to have prediabetes compared to those with normal BMI, (P. value <0.05, significant), (**Table 5**).

For the association between smoking and prediabetes, smokers were more likely to have prediabetes compared to non-smokers; 26.7% vs. 17.2%, , respectively, (P. value <0.05, significant), which indicated that smoking increases the likelihood of prediabetes, (**Table 6**).

For more precis analysis and adjustment for the confounding effect of the variables, we conducted a binary logistic regression analysis to identify the predictors of prediabetes, where the socio-demographic and clinical variables were entered as independent variables against prediabetes as dependent binary variable; the results of this analysis showed multiple significant predictors of prediabetes; these were older age (OR =2.2), male gender (OR=1.96), lower level of education (OR=1.42), SBP (OR= 1.43), DBP (OR=1.33), BMI (OR= 2.6) and smoking (OR= 1.6), while marital status and occupation remained not significantly associated with prediabetes. According to values of OR, stronger predictor was higher BMI followed by older age , male gender, smoking, SBP and DBP, in all these predictors, (P. value <0.05, significant), furthermore, we conduct forest plot to compare these odds ratios.

Table 1. Socio-demographic characteristics of the studied group (N=432)

Variable	No.	%
Age (year)		
≤ 35	122	28.2
36-45	115	26.6
46-55	102	23.6
56-65	62	14.4
>65	31	7.2
Mean (SD): 44.3 (13.9)		
Range: 20 - 72		
Gender		
Male	177	41.0
Female	255	59.0
Marital status		
Married	374	86.6
Unmarried*	58	13.4
Education		
Illiterate	60	13.9
Primary school	95	22.0
Secondary	189	43.8
University/Higher	88	20.4

SD: standard deviation, * Unmarried include single, divorced and widowed

Table 1. cont.

Occupation		
Employed	182	42.1
Unemployed	250	57.9
Smoking		
Yes	110	25.5
No	322	74.5
Body mass index		
Normal	205	47.5
Overweight	131	30.3
Obese	96	22.2

SD: standard deviation

* Unmarried include single, divorced and widowed

Table 2 Clinical and biochemical parameters of the studied group (N=432)

Parameter	Mean	SD	Minimum	Maximum
SBP (mmHg)	129.3	5.9	120	150
DBP (mmHg)	83.1	4.4	75.2	94.9
FSG (mg/dL)	91.3	8.4	70	121.7
RBG (mg/dL)	137.8	16.5	128.2	191.3
HbA1c (%)	5.2	0.5	4.1	6.4

SD: Standard Deviation, SBP: systolic blood pressure; DBP: diastolic blood pressure

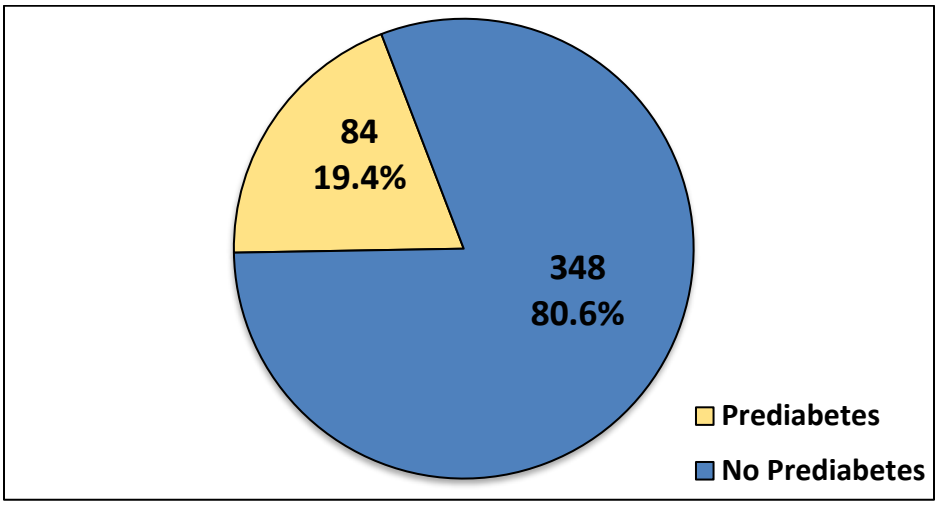

Figure 1. Distribution of prediabetes among the study population (N=432)

Table 3. Relationship between socio-demographic variables and prediabetes status (N=432)

Variable	Prediabetes (N=84)		No Prediabetes (N=348)		P. value
	No.	%	No.	%	
Age (year)					
≤ 35	11	9.1	110	90.9	<0.001*
36-45	12	10.3	104	90.2	
46-55	36	35.3	66	64.7	
56-65	18	29.0	44	71.0	
>65	7	22.6	24	77.4	
Mean (SD)	50.8 (12.1)		42.7 (13.9)		<0.001*
Gender					
Male	44	24.9	133	75.1	0.018*
Female	40	15.7	215	84.3	OR: 1.78
Marital status					
Married	74	19.8	300	80.2	0.649
Unmarried	10	17.2	48	82.8	
Education					
Illiterate	21	35.0	39	65.0	0.013*
Primary school	17	17.9	78	82.1	
Secondary	31	16.4	158	83.6	
University/Higher	15	17.0	73	83.0	
Occupation					
Employed	33	18.1	149	81.9	0.556
Unemployed	51	20.4	199	79.6	

* The Chi-square statistic is significant at P<0.05. OR: odds ratio

Table 4. Comparison of clinical and biochemical parameters according to prediabetes status of the study population (N=432)

Parameter	Prediabetes (N=84)		No Prediabetes (N=348)		P. value*
	Mean	SD	Mean	SD	
SBP (mmHg)	135.6	6.2	127.8	4.6	<0.001
DBP (mmHg)	87.7	3.9	82.4	3.8	<0.001
FBG (mg/dL)	105.1	2.9	88.6	5.2	<0.001
HbA1c (%)	6.1	0.2	5.2	0.3	<0.001

SD: Standard Deviation, SBP: systolic blood pressure; DBP: diastolic blood pressure,
FBG: Fasting blood glucose, P. value <0.05, significant in all comparisons,

Table 5. Relationship between body mass index and prediabetes status

	Prediabetes (N=84)		No Prediabetes (N=348)	
BMI Category	No.	%	No.	%
Normal	24	28.6	181	52.0
Overweight	31	36.9	100	28.7
Obese	29	34.5	67	19.3

Chi square is significant, P. value <0.001

Table 6. Relationship between smoking and prediabetes status

	Prediabetes (N=84)		No Prediabetes (N=348)		Total (N=432)	
Smoking	No.	%	No.	%	No.	%
Yes	27	32.1	74	21.3	101	23.4
No	57	67.9	274	78.7	331	76.6
Total	84	100.0	348	100.0	432	100.0

Chi square is significant, P. value = 0.034

Table 7. Results of binary logistic regression analysis for the predictors of Prediabetes status among the studied group (N=432)

Variable in equation	B	S.E.	Wald	OR	95% C.I. for OR	Sig.
Age	0.79	0.26	9.22	2.2	1.32 - 3.67	0.002
Gender	0.67	0.28	5.8	1.96	1.13 - 3.39	0.016
Marital status	0.17	0.20	0.7	1.18	0.81 - 1.73	0.396
Education	0.35	0.17	4.5	1.42	1.03 - 1.96	0.034
Occupation	0.17	0.15	1.3	1.18	0.88 - 1.58	0.262
SBP	0.36	0.16	5.1	1.43	1.05 - 1.95	0.024
DBP	0.29	0.13	4.9	1.33	1.03 - 1.73	0.027
BMI	0.95	0.30	10.1	2.6	1.44 - 4.68	0.001
Smoking	0.47	0.18	7.2	1.6	1.14 - 2.27	0.007

SBP: systolic blood pressure, DBP: diastolic blood pressure, BMI: Body mass index

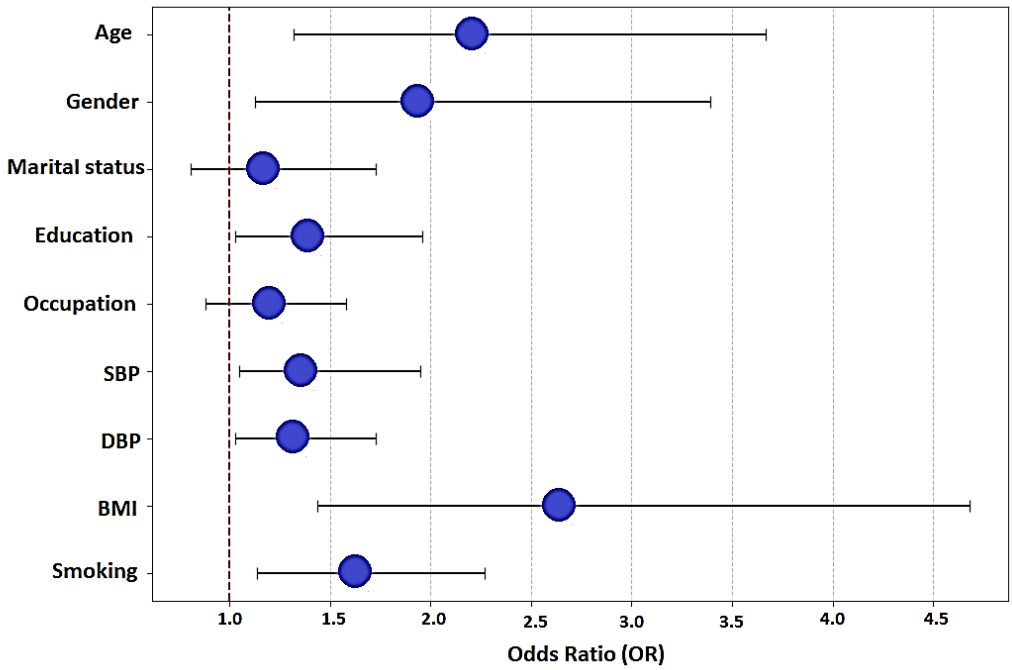

Figure 1. Forest Plot from binary logistic regression analysis showing the Odds ratio of predictors for prediabetes

DISCUSSION:

Globally, diabetes is one of the significant health problems today. According to the World Health Organization (WHO), the number of people with the disease has increased fourfold since 1990 [14]. Prediabetes is a condition where a person has elevated blood sugar levels, but below the threshold for a diagnosis of diabetes mellitus (DM). The term "prediabetes" represents an umbrella term that encompasses "impaired fasting glucose" and "impaired carbohydrate tolerance" [15]. However, several factors affect the blood sugar levels like lifestyle, including unbalanced diet, low physical activity, lack of sleep; heredity; concomitant diseases (endocrine, cardiovascular and others); taking certain medications; stress and other factors[16]. The global prevalence of prediabetes is an alarming trend noted by researchers and health organizations worldwide. It is expected that by 2030, more than 470 million people may suffer from prediabetes, indicating a significant increase in this condition [17]. Prediabetes is often associated with a number of factors, including impaired pancreatic β-cell function and insulin resistance. The insufficient insulin secretion and pancreatic β-cell apoptosis affect lead to impaired glucose regulation[18].

Patients with prediabetes typically do not exhibit obvious clinical signs of the disease. However, at the physiological level, significant disturbances are already observed, which gradually lead to the development of diabetes. Diagnosing prediabetes is challenging, as the condition typically presents without noticeable symptoms. In 90% of cases, prediabetes is discovered incidentally during routine laboratory tests or in the presence of comorbidities [5,19]. According to various international studies, there is a significant risk of progression from prediabetes to diabetes, estimated to range from 5% to 10% per year [8]. However, there is also a likelihood of returning to normoglycemia, or normal blood glucose levels, in the same percentage range. These data highlight the complexity and dynamic nature of prediabetes [8]. Therefore, the risk of developing diabetes in individuals with prediabetes is a key area of research in the international medical community and screening for prediabetes and estimating its prevalence and trend is crucial to prevent progression to DM, In Iraq, according to previous Iraqi studies, the number of Iraqi people with Prediabetes are annually increases, hence we conducted this study to assess the prevalence of prediabetes among Iraqi people who were apparently healthy with no any clinical evidence of DM.

Our study included 468 participants; however, 36 individuals were excluded because unfortunately confirmed to have T2DM and they were referred to consult a diabetologist. The net sample was 432 participants with a mean age of 44.3 ± 13.9 (Range: 20-72) years. We found that 84 participants met the criteria of prediabetes producing a prevalence rate of 19.4% among the study population. According to our univariate analysis, we found that the prevalence of prediabetes increased with advancing age, were the lower prevalence rates reported in those at age of ≤ 35 years (9.1%) followed by (10.3%) among those aged 36-45 years and the higher rate of 35.3% among those aged 46-55 years, however, this trend indicated a positive association between age and the prevalence of prediabetes. Our regression analysis revealed 7 significant predictors of prediabetes, these were older age (OR= 2.2), male gender (OR=1.96), lower level of education (OR=1.42), high SBP (OR= 1.43), high DBP (OR=1.33), higher BMI (OR= 2.6) and being a smoker (OR= 1.6), while marital status and occupation were not significantly associated with prediabetes. According to values of OR, stronger predictor was higher BMI, where obese participants had higher likelihood of prediabetes by about 160% compared to those with normal BMI, followed by older age where

these individuals had 2.2-fold higher odd to have prediabetes with almost 120% increase in the likelihood of prediabetes compared to younger individuals. Males had almost 96% increase in the odd of prediabetes compared to female, smokers had 60% increase in the likelihood of prediabetes compared to nonsmokers, SBP and DBP were moderately strong predictors with 43% and 33% increase in the likelihood of prediabetes compared to those with lower SBP and DBP even within the normal ranges. Our findings showed that neither marital status nor occupation was predictor of prediabetes and they did not show significant association. Our findings were not unexpected, previous studies documented that the prevalence of prediabetes is increasing with the age and less likely in young adults [20,21]. With regards to gender distribution, males were more likely to have prediabetes, these findings supported that reported in previous Iraqi studies and other international studies; Jasim et al. [19]reported that 53% of males had prediabetes compared to 47% in females, Alogaily et al. found that more than half of prediabetes individuals in Baghdad were males [22]. Other international studies showed almost similar distribution across both genders where in major studies such as those of CDC, men showed almost 1.2 increased likelihood of prediabetes than women [23]. Obesity, higher BMI have shown to be risk factor and predictor of prediabetes, this finding supported that reported by two studies from Egypt and USA [24,25]. In this context, many authors have suggested that the accumulation of abdominal fat plays an important role in insulin resistance, with excess visceral fat being associated with decreased insulin sensitivity in peripheral tissues [26]. Smoking is considered risk factor for many chronic diseases; in the context of DM and prediabetes, it had been documented to be associated with insulin resistance and hyperglycemia, therefore, smokers are more likely to develop DM preceded by prediabetes [27]. From other point of view, the effect of smoking mainly attributed to the effect of nicotine that promoting the insulin resistance [28]. Conversely, Yesmin et al. found that smoking was not significantly associated with prediabetes [29]

We found that lower level of education is associated with higher prevalence of prediabetes, despite our finding supported some previous studies [30], but conflicting results were reported among other studies [29].

For the relationship between elevated blood pressure, our findings supported the fact that prediabetes is frequently have elevated blood pressure than non-prediabetes, where their systolic and diastolic blood pressure usually at the upper normal ranges [31,32].

Analysis of the results showed that the pre-diabetic have a clear tendency to have elevated SBP and DBP; these results are in agreement with several population studies that confirm the increased prevalence of hypertension in the diabetic population [33]. From other point of view, high blood pressure is highly associated with the risk of cardiovascular morbidity and mortality, being one of the determining factors in the occurrence of cardiovascular events in diabetics and prediabetics being associated with the initiation or progression of micro- and macrovascular complications [34,35].

Our study is not free of limitation where we did not perform lipid profile tests and some other investigation because these tests are not available all the time in the PHCs. Also we could not assess the dietary habit and physical activity of our study population that may be confound our findings regarding the predictors, however, we control this by conducting regression analysis which represent an appeal to manage confounders. However, future studies can take these into account particularly community-based studies

CONCLUSION:

The results of this study allow us to conclude that the prevalence of prediabetes among Iraqi peoples visiting the PHCCs and the main Teaching Hospital in Najaf was 19.4% which is relatively higher than that reported in previous Iraqi studies in past years and reflected the increasing trend of prediabetes among Iraqi population. The prevalence of prediabetes was increasing with the age, with higher number in individuals aged between 46-55 years. Males had increased likelihood of having prediabetes than females. Prediabetics presented the highest percentages of obesity, higher rate of smoking, lower education levels and higher systolic and diastolic blood pressures. According to our regression analysis high body mass index was the stronger predictor of prediabetes followed by older age, male gender and smoking, moderately strong predictors were level of education, SBP and DBP. Neither marital status or occupation can predict prediabetes. The results of this study reinforce the need for and usefulness of early diagnosis, and recommend more frequent and efficient measures to control the modifiable factors. These measures may include both lifestyle

changes and pharmacological interventions, in order to more effectively control and prevention of progression to diabetes. We recommended further studies for annual monitoring of the trend of prediabetes among Iraqi population

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