1 **Prevalence metabolic disorder in adolescent Residing in Al-Dawadmi**

2 **and Shaqra regions of Saudi Arabia**

3 **Abstract:**

4 The recent study was aimed to estimate the prevalence and develop the relationship of

5 the clinical history like diabetes, cardiac disease and vitamin D deficiency and obesity

6 and their impact on metabolic disorders for adolescent residing near Dawadmi and

7 Shaqra region. Two hundred samples (142 Females & 58 Males) were utilized in the

8 study with an age ranging 13-20 and distributed the questionnaire to record the

9 responses. The results exhibited that 38 % subjects responded positively for clinical

10 history with cardiac disease, while 70.5 and 47 % responded positively for the clinical

11 history with diabetes and vitamin D deficiency. The clinical history with diabetes,

12 cardiac disease and vitamin D deficiency was observed the major risk factors acting

13 in descending order diabetes-cardiac disease-vitamin D deficiency.

14 **Keywords:** Metabolic disorder in adolescent, risk factors

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16 **INTRODUCTION:**

17 The prevalence of metabolic syndrome in adolescent is enhanced due to the increase

18 in the obese population [1]. The amalgamation of dyslipidemia, regulation of glucose,

19 adiposity and hypertension is denoted as the metabolic syndrome that have long been

20 associated in the obese adolescent with high risks of diabetes and heart disease [2].

21 Metabolic syndrome is reported with an increased risk of death from Coronary heart

22 disease (CHD), Cardiovascular disease (CVD), and all other causes [3]. On the other

23 hand the level of 25(OH)D in the serum has been reported to possess an inverse

relationship with the metabolic Syndrome [4-6]. Metabolic syndrome affects nearly twenty five percent of the adolescent population worldwide with varying prevalence according to the definition used, ethnicity under study, and level of urbanization [7]. Many research has been carried out by various countries targeting the prevalence of metabolic syndrome in adolescent population [8-10]. Mar Bibiloni M reported a cross sectional study aiming the metabolic syndrome in adolescent in the Balearic island [11]. Recently the prevalence of metabolic syndrome among adolescents in a city in the Mediterranean area with comparison of two definitions has also been reported by Rafael Galera-Martínez et al. [12]. The worldwide prevalence of the metabolic syndrome has been reported 10-84%, 34.5 %(ATP III) and 39 % (IDF) [13, 14]. The prevalence of metabolic syndrome in gulf countries like Oman, UAE has been reported to be 17% and 40.5 % following both ATP III and IDF Criteria. The prevalence of obesity in Saudi Arabia has been reported as 39.3 % following the ATP III criteria additionally the prevalence of other parameters for metabolic syndrome has been reached to the apex in the kingdom [15, 16]. Saudi Arabia has been considered worldwide as the country with high prevalence of diabetes and in the same manner the obesity has the direct effect on more than 1/3 adolescent population [17]. The recent study is designed to understand the prevalence of metabolic syndrome, association with obesity and risk factors in adolescent population of Al-Dawadmi and Shaqra Region of Saudi Arabia.

MATERIALS AND METHODS:

This study was performed in the Department of Basic Sciences, College of Medicine Dawadmi, Shaqra University KSA in collaboration with hospitals of Dawadmi and Shaqra region. The study protocol was approved by the college scientific council and ethical committees of our institute/university.

SAMPLE SIZE ESTIMATION:

The sample size was estimated according to the prevalence of metabolic syndrome in saudi that is 10%. The sample size was estimated according to the formula:

N= 4PQ/ L² where, P= prevalence of metabolic syndrome, Q= 100-P, L=Errors

$$N= 4×10×90/ 5×5 = 144$$

This sample size is estimated according to the prevalence of metabolic syndrome in Saudi that is varies between 9.5 -10.0 percent.

The sample size was found to be 144 and we will take round figure 150.

STUDY POPULATION

In the present study the subject under investigation was chosen on the basis of some parameters such as- age, sex, dietary conditions and their life styles with the experts.

The inclusion and exclusion criteria will be as follows-

Inclusion Criteria

1. Subject with diabetes
2. Subject with obesity
3. Subject with vitamin D deficiency
4. Subject with heart disease
5. Subject of age between 13-20.

Exclusion Criteria

1. Patients below age 13 or above 20
2. Pregnancy
3. Patients undergoing chemotherapy
4. Patients undergone surgeries

74   5.   HIV Patients

75   6.   Patients excluded with Strokes, Ischaemia, cardiac arrest.

76   **Methodology and Techniques**

77   The recent study is a survey based study that include the questionnaire applying the

78   direct contact to the patients. Statistical analysis of the data was performed using

79   window based latest version of SPSS software, $p < 0.05$ was considered statistically

80   significant (Performa attached as supplementary material).

81   **RESULTS AND DISCUSSION:**

82   The survey based study was carried out targeting the peoples residing in Dawadmi

83   and Shaqra region. The questionnaire was distributed among two hundred adolescents

84   (142 Females & 58 Males) with metabolic disorders and their response were recorded.

85   When we tried to develop the relationship between the clinical history of these people

86   with respect to the cardiac disease 38 % responded that they have the relatives with

87   cardiac disease while 62 % do not have any relative with cardiac disease. The findings

88   were a different in case of clinical history with respect to diabetes 70.5 percent

89   subjects responded positive and 29.5 percent negative. The clinical history

90   considering the vitamin D deficiency exhibited wonderful results and stated that 47 %

91   subjects were having relatives with vitamin D deficiency while 52 % subjects

92   responded negatively.

93   **Figure-1** Representing the distribution of subjects on the basis of gender
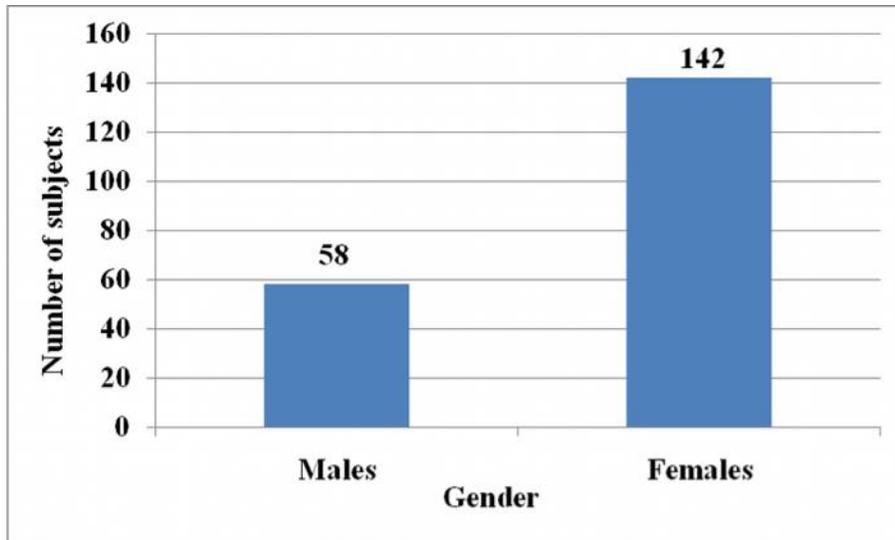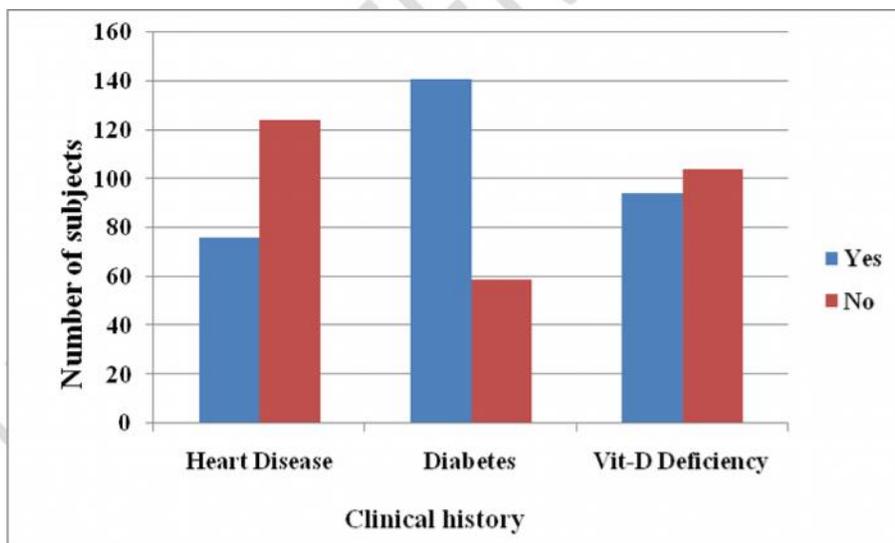
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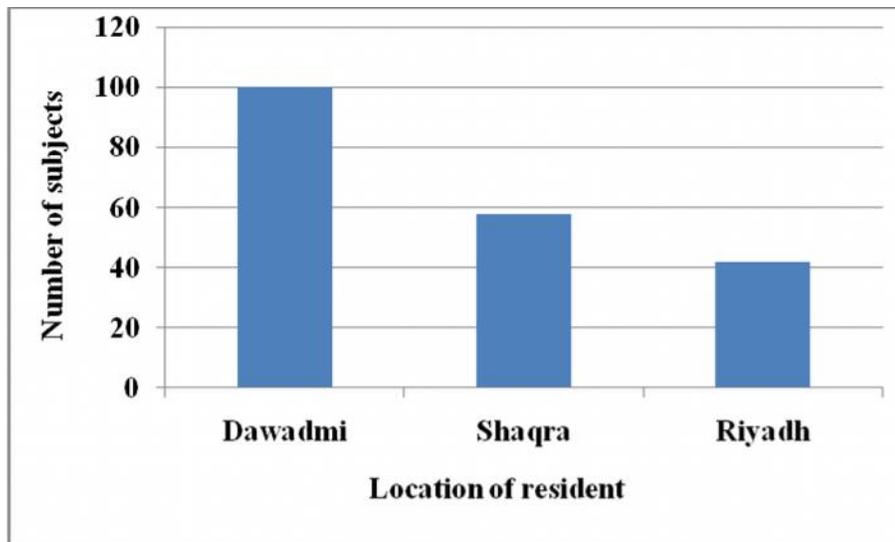97 **Figure-2** Representing the response of the subjects with clinical history like heart

98 disease, diabetes and vitamin D deficiency

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100 **Figure-3** Representing the distribution of subjects on the basis of location of

101 residents.

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CONCLUSION:

Two hundred patients (142 females and 58 males) residing in dawadmi and shaqra region with metabolic disorder were subjected for the study and results revealed that the metabolic disorder has strong relation with vitamin D deficiency. On the other hand it was also observed that approximately fifty percent people with obesity were found to possess diabetes and cardiovascular diseases despite their age. The study will help to understand the risk factors and monitor the prevalence rate of metabolic syndrome and their proper management.

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