

Predictive Study for The Competency Level of Health College Students Regarding Insulin Resistance as a Future Health Care Provider

Abeer Yahia Mahdy¹, Fatma Abdelaziz Mohammed², Hamda Ahmed Mohamed Eldesoky³

¹ Professor of Medical-Surgical Nursing, Faculty of Nursing / Benha University, Egypt, Assist. Professor of Medical-Surgical Nursing, Nursing College, Najran University, Saudi Arabia. drabeeryahia@gmail.com .<https://orcid.org/0000-0002-5045-3580>

²Assistant Professor of Medical-Surgical Nursing, College of Nursing, Najran University, Saudi Arabia, famohammad@nu.edu.sa, ORCID iD: 0009-0000-0703-0112, Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing, Cairo University, Egypt.

³Assist. Professor of Medical-Surgical Nursing, Nursing College, Najran University, Saudi Arabia. hmedsoky@nu.edu.sa, <https://orcid.org/0009-0009-8532-471X>

Corresponding Author: Hamda Ahmed Eldesoky

Abstract

Background: Prediabetes has been considered to be a reversible condition; a modification of lifestyle and other interventions can be successfully applied during the prediabetes period to prevent the development of type 2 diabetes. **Aim of the study:** To assess the risk factor of prediabetes among female health college students at Najran University. **A cross-sectional study** was conducted in three health colleges at Najran University, including medicine, nursing, and applied college. A total of 402 study participants of female students were eligible to participate in the study, which was conducted from January to February 2018. **Data were collected through** an electronic questionnaire. Part I: Socio-demographic data. Part two II: Risk factors for prediabetes. Part III: Knowledge assessment tool, Part IV: Attitude towards insulin resistance & Part V: Practice to ward IR. **Results:** More than half (64.9%) of females had good knowledge of prediabetes levels. Moreover, there was a statistical association between demographical characteristics according to smoking status and knowledge of risk factors for prediabetes among female health college students. The results of the present study revealed that 64.9 % of female students had a good level of knowledge about prediabetes & 92.3% of them had a positive attitude toward prediabetes, and 87.8% had a good level of practice toward prediabetes; additionally, statistically significant positive correlations were found between firstly; students' knowledge and attitude ($r = .159, P = .001^*$). Secondly, between students' knowledge and practice ($r = .242, P = .000^{**}$). **Recommendation:** Educational curriculum and facilities should be applied to enhance knowledge according to risk factors for prediabetes. Appropriate and stringent associated factors in lifestyle modifications need to be implemented to minimize the risk of developing prediabetes later in life.

Keywords: Prediabetes, Female students, Risk factors, prediabetes screening & diabetes type 2.

Introduction

Several previous studies have recommended that further screening and awareness campaigns toward insulin resistance (IR) focus on primordial prevention techniques and be current with new risk factors. Because (IR) is currently an underlying phenomenon in the etiology of most non-communicable diseases (Badawy et al. (2023).

The International Diabetes Federation stated that people with diabetes are expected to increase from 171 million in 2000 to 578 million

in 2030 globally. In July 2020, the number of people with diabetes was calculated to be almost 463 million worldwide (Williams et al (2020). prediabetes prevalence is anticipated to increase to 8.3% of the global adult population, equivalent to an estimated 587 million individuals. Unadjusted regional prevalence is currently highest in the North America and Caribbean (15.4%) and Central and South America (10.0%) IDF regions and lowest in South East Asia (3.0%) and European (5.5%) regions (Yip et al., 2017). the incidence of DM is around 23.4% in the SA population in Saudi

Arabia (SA). It is higher in males than in females **Almetwazi et al. (2019)**.

Additionally, SA has been ranked among high-risk nations regarding overweight and obesity, which is an excellent challenge for the country's public health. **Balfoon, et al. (2019)**. An alarming figure is that 5%-10% of prediabetic people annually progress to type 2 diabetes mellitus (T2DM); in addition, 40.3% of diabetic patients are unaware that they have the disease. Studies showed an increased risk of cardiovascular disease and all-cause mortality among prediabetics. Additionally, progression to DM poses a significant threat to the healthcare budget in Saudi Arabia (**Huang et al., 2016**).

The level of awareness and knowledge regarding the disease among the population helps a community manage it properly both on the prevention and management front. It is essential to target the sections of society who are or would be involved in the care of diseased persons because if we succeed in creating good awareness and positive attitudes towards the difficulties and miseries of the patient in our future health care professionals, then we can expect positive trends both in planning and management side (**Ahmed et al. 2019**).

In dealing with chronic diseases like DM, various aspects need proper attention like health knowledge, the Importance of regular exercise, taking a balanced diet and avoiding junk foods, and above all, creating a healthy atmosphere in society so that each individual realizes one's responsibility to keep himself and his family members in an optimal healthy state (**American Diabetes 2019**). The prevalence of DM is expected in SA, so we must explore our young students' awareness of DM. So that policymakers can devise policies to educate the young generation. We aimed to investigate knowledge, attitudes, and practices regarding DM among university students.

The primary treatment approach includes lifestyle changes such as exercise and dietary adjustments. Some medications can be used to reduce the risks associated with prediabetes. (**Bennasar-Veny et al., 2020**). For many people, prediabetes and diabetes are diagnosed through a routine screening at a check-up. However, it is not only medical doctors who can be very

effective in early detection and treatment. The earlier prediabetes is diagnosed, the more likely an intervention will be successful (**American Medical Association, 2020**).

Competencies combine several factors like motives, traits, self-concepts, attitudes or values, skills, and abilities. All of them can differentiate superior performers from average performers (**Carris et al., 2019**). The confidence and competence of AHP students to deliver on Public Health have not been investigated, SO initial investigation into the perceptions of AHP students regarding their role, confidence, competence, barriers, and challenges to delivering brief public health interventions and advice (**McLean et al., 2018**).

Among US adults aged 18 years or older, age-adjusted data for 2017–2020 indicated that 10.8% of adults had prediabetes based on both elevated fasting plasma glucose and A1C levels. A higher percentage of men (41.0%) than women (32.0%) had prediabetes based on their fasting glucose or A1C level (**Centers for Disease Control and Prevention, 2021**). Preparing future professionals for a successful healthcare career means we need to engage students meaningfully across diverse learning environments and focus more on competency-based learning to ensure they are practice-ready.

A complex interaction of further factors that include life expectancy, socioeconomic status, wealth, access to healthcare services, levels of education, exposure to disease/public health awareness initiatives, and regional levels of obesity influence prevalence rates. As populations become more urbanized, become wealthier, gain better access to nutrition, healthcare, and education, and live longer, rates of prediabetes are expected to increase. These increases are expected to be more pronounced in developing and developed countries as lifestyles become more 'Westernized' (**Hostalek, 2019**).

Significance of the study

There has been a rise in the prevalence of prediabetes in the overall world. Diabetes increases the risk of developing many complications in addition to increasing the cost of treatment and loss of productivity. Thus, there is a need for an approach to improve the

knowledge and awareness regarding prediabetes among all communities and healthcare students as future healthcare providers to ensure early detection of the disease—prompt treatment, and recommendations for initiatives to care for this problem. Future healthcare providers and practitioners (health colleague students) will be responsible for handling people with prediabetes. So, Preparing future professionals for a successful healthcare career means engaging students meaningfully across diverse learning environments and focusing more on competency-based learning to ensure they are practice-ready.

Aim of the study

The study was conducted to predict the competency level of health college students regarding insulin resistance as a future healthcare provider.

Research Question

- 1- What is the female health college student's level of knowledge about insulin resistance?
- 2- What is the level of female health college students' attitude toward insulin resistance?
- 3- What is the level of female health college students practice regarding insulin resistance?
- 4- Is there a relation between socio-demographic data and level of knowledge?

Materials and Methods

Research design:

A cross-sectional study was used to assess the prevalence of prediabetes risk factors among female health college students.

Setting:

Data for the current study was collected at the female health college (Medicine, Nursing & Applied college) at Najran University in Saudi Arabia.

The sample subjects

Study Population The study population included female health college students in different academic years 1443.

The researchers used convenience sampling to enroll approximately 402 female students from Najran University, College of Health. They are distributed as follows:- Nursing college (159 students), Medicine college (118 students) & Applied college (124 students).

Data Collection Instruments:

Researchers developed a self-reported electronic questionnaire designed on Google Forms after reviewing recent and related literature for data collection; it contained three main parts.

Part I: Socio-demographic data. The researcher developed it to collect data related to sociodemographics such as age, residence, marital status, health college, diagnosis of gestational diabetes, diabetes, and family income.

Part II: Risk factors for prediabetes (Quoted from the Ministry of Health in Saudi Arabia (2022)), which contains weight, height, smoking status, having a mother, father, sister, or brother with diabetes, high blood pressure diagnosis, Physical activity, and eating high rich sugar food (Ministry of Health in Saudi Arabia, 2022).

Part III: knowledge Assessment tool:

To assess knowledge level of IR among female health college students. Which developed by the researchers after reviewing the literature (Gopalakrishnan et al., 2017 & Khan et al., 2019), is composed of (8) questions, which are knowledge about: - the meaning of IR, the cause of IR, daily activity can treat IR, 45 years or old has to be screened for IR, always people risk for IR, how to prevent IR, and high weight is a risk factor for IR.

Scoring system for total knowledge:

- Good knowledge = was assigned to female students who scored 76 to 100%.
- Moderate knowledge = was assigned to female students who scored 50% to 75%.
- Poor knowledge = was assigned to female students who scored 1 to 49%.

Part IV: Attitude towards insulin resistance, To assess attitude level of IR among

female health college students, developed by researchers after reviewing the literature (Alemayehu, A. M., & Sisay, M. M. (2021)., which contains Importance of an examination for IR, family members should be screened for IR. Support from family and friends is essential to control IR; avoid consuming too much sugar to control IR. IR doesn't seriously affect the lifestyle. The total belief scores were categorized into three levels: Negative belief less than <33.3, Neutral belief from 33.33- 66.67, and Positive belief from 66.67 -100.

Part IV: This part was developed by the researchers after reviewing the literature (Al-Wagdi, B. E., & Al-Hanawi, M. K. (2024) to assess practice to word considerations about prophylactic treatment, physical activity daily, checking blood sugar regularly, and try to avoid refined sugar/sugary foods Scoring system: female student practices were scored on a 3 point rating scale distributed as Done correctly = 1, Done incorrectly or Not done = 0. Nevertheless, student practice scores were summed and converted into percentages.

Reliability and validity of the tool:

- The researchers' experts formulated the validity of the questionnaire, which was modified to add or omit to clearly and correctly, misinterpreted, and doubtless from credence and completeness of study tools.

- The questionnaire's reliability was tested using Cronbach's Alpha, so the tool was highly reliable for the data collection coefficient (0.761).

Pilot study

This was carried out on 10% of the participants to ascertain clarity and understand all the questions, but no necessary changes were made.

Fieldwork:

- After reviewing all available literature to develop the tools, put the tools in the electronic form in Google Form (G.mail). A question was placed at the beginning of the questionnaire tool, asking students to agree or disagree to participate in filling out the questionnaire tool. Data collection started from January 2022 to April 2022.

- A structured electronic online questionnaire was used to collect data through Google Forms. The authors or researchers created a one-page recruitment sheet that was shared with students in their academic groups through WhatsApp. The sheet explains the study's purpose, procedures, voluntary participation, confidentiality, and questionnaire completion instructions.

- The researchers explained the method of filling out the tool to the students and how to verify the students filled it. It gave them instructions about the time of the tool, which was not more than 5 minutes, and explained the ethical considerations through a paragraph at the beginning of the questionnaire. The tool was translated to Arabic because of the new terminology to facilitate student understanding.

Ethical Approval

The permission for data collection was obtained from the ethical committee after the instruments were approved by the Najran Health Affairs ethical committee, followed by clearance by the deanship of scientific research at Najran University. Before data collection, electronic written consent was obtained through WhatsApp. Students were informed that they were allowed to participate or not in the study and had the right to withdraw at any time; the researcher assured them that anonymity and confidentiality of the subject's data would be maintained.

Data Analysis

A packaged computer analysis program, Statistical Package for the Social Science (SPSS 23.0), was used for statistical analysis of this data. Descriptive statistics were used to interpret the demographic data of the participants. Descriptive measures, including frequency, the percentage for categorical variables, and the mean and standard deviation for numerical variables. To find the significant association, a chi-square test was used for categorical data, an ANOVA test was used for numerical data, and a P-value ≤ 0.05 was considered significant.

Result:

Table 1: Illustrates the Socio-demographic characteristics and risk factors of

the participants. This study included 115 medical students aged 18–20, 86 medical students aged 21–23, and 201 medical students aged 23 or more. Around half the participants (50.0%) were more than 23 years with a mean age of 23.07 ± 3.24 , and 60.2% ($n = 242$) were single. Regarding health college, 39.6% were from nursing college, 29.6% from medicine college, and 30.8% were from applied college, with the majority of the participants, 81.3%, being from a rural area.

Regarding risk factors, it was noticed that around one-third (35.1% and 35.3%) of the participants were normal weight and overweight. Also, the majority of the participants (81.8% & 94.5%) had not been diagnosed with gestational diabetes and were non-smokers. Furthermore, 53.5% of them have a mother, father, sister, or brother with diabetes, and 74.4% had no medical history for other health problems. Also, around half (51.5%) of participants did not practice physical activity. Finally (74.9%) of participants were eating high-sugar food.

Table 2 presents participants' knowledge of prediabetes. It was noted that about two-thirds of students (64.9%) had good knowledge about prediabetes, compared to only 8.2% who had poor knowledge. Also, it was pointed out that the participants had a total mean score of (11.85 ± 3.73) .

Table 3: Displays participants' attitudes to the total scores about prediabetes. It was found that the vast majority (92.3%) of the participants had a positive attitude toward prediabetes, compared to 2.0% only who had a negative attitude; also, the table revealed that the participants had a total mean score of (28.61 ± 3.84) .

Table 4: Description of total scores and participants' practice levels about prediabetes. It can be observed that most of the students

(87.8%) had a good level of practice toward prediabetes, while (12.2.0%) of them had a poor level of practice. Also, the table revealed that the participants had the total means scores of (24.21 ± 3.25) .

Figure (1) Presents the mean percent scores of participants' knowledge, attitude, and practice; it was noted that the mean percent scores of total knowledge were 79.02 ± 24.9 and the positive attitude took the highest mean $(95.3 \pm 12.8\%)$ while the lowest domain was practice (60.5 ± 8.1) .

Table 5: Reflect the correlation matrix between knowledge, attitude, and practice participants. According to this table, statistically significant positive correlations were found between firstly, students' knowledge and attitude ($r = .159, P = .001^*$). Secondly, between students' knowledge and practice ($r = .242, P = .000^{**}$).

Table 6 displays the best-fitting multiple linear regression models for participants' knowledge, practice, and attitude scores. It is evident that the statistically significant positive independent predictors of the participant knowledge. The model explains 25% of the variation in the attitude score. As for the practice score, the table illustrates that the knowledge score was its statistically significant independent positive predictor. The model explains 59% of the variation in this score.

Table 7: This table illustrates that there was a statistically significant difference between participant knowledge and socio-demographic characteristics and risk factors (age, family income, residence, BMI, have diagnosed with gestational diabetes, having a mother, father, sister, or brother with diabetes, associated disease, physical activity and eat high rich sugar food ($p = 0.000^*$).

Table 1: Socio-demographic characteristics and risk factors of the participants.

Socio-demographic characteristics		No. (402)	%
Age (Years)	18-20	115	28.6
	21-23	86	21.4
	>23	201	50.0
	Mean± SD	23.07±3.24	
Marital status	Single	242	60.2
	Married	143	35.6
	Divorced	6	1.5
	Widowed	11	2.7
Family income	< 5000	100	24.9
	5000-10000	157	39.1
	> 10000	145	36.1
Health college	Nursing	159	39.6
	Medicine	119	29.6
	Applied college	124	30.8
Residence	Rural	75	18.7
	Urban	327	81.3
Risk factors for prediabetes			
Total body mass index	Underweight	119	29.6
	Normal	141	35.1
	Over weight	142	35.2
	Obese	10	2.5
Have you ever been diagnosed with gestational diabetes?	Yes	73	18.2
	No	329	81.8
Smoking status:	Smoker	13	3.2
	Non-smoker	380	94.5
	Ex-smoker	9	2.2
You have a mother, father, sister, or brother with diabetes	Yes	215	53.5
	No	187	46.5
You ever been diagnosed with associated disease	Hypertension	89	22.1
	Cardio vascular disease	14	3.5
	No	299	74.4
Physically activity	Yes	195	48.5
	No	207	51.5
Do you eat high rich sugar food?	Yes	301	74.9
	No	101	25.1

Table 2 : Descriptive statistics of Knowledge of Participants about Insulin Resistance

Knowledge level	NO (402)	%
Poor	33	8.2
Fair	108	26.9
Good	261	64.9
Total score		
Min. –Max.	0.00	-15.00
Median		13
Mean ±SD.		11.85±3.73

Table 3: Describes Participants' attitude total score about Insulin Resistance

Attitude level	NO (402)	%
Negative	8	2.0
Neutral	23	5.7
Positive	371	92.3
Total score		
Min. –Max.		10.0- 30.0
Median		30
Mean ±SD.		28.61± 3.84

Table 4: Description of total scores and participants' practice levels about Insulin Resistance.

Practice level	NO (402)	%
Poor	49	12.2
Good	353	87.8
Total score		
Min. –Max.		15.0-32.0
Median		24
Mean ±SD.		24.21 ±3.25

Figure (1): Participants' knowledge, attitude, and practice percent mean score about

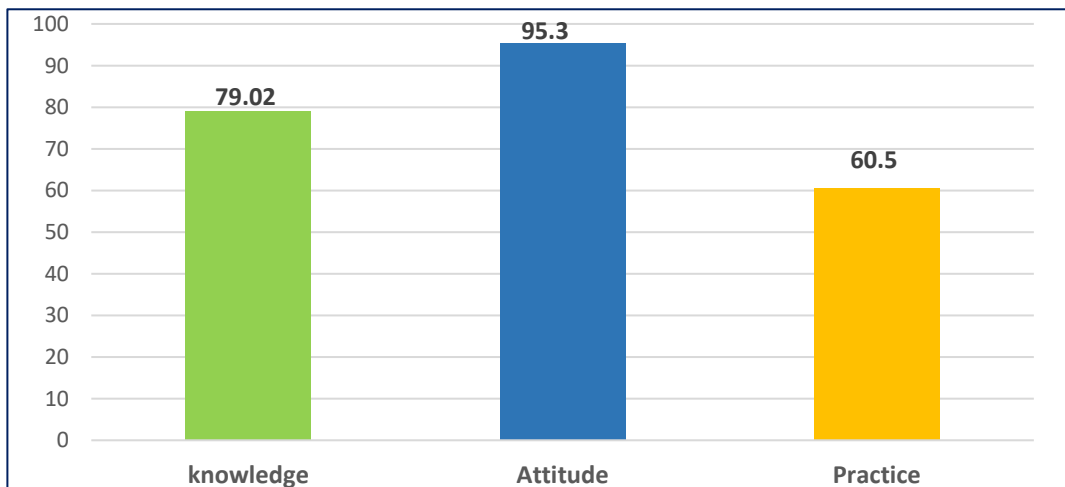


Table 5: Spearman correlation between knowledge, attitude, and practice (% score) of participants(n = 402).

Variable (% score)		Composite Attitude	Composite Practice
Composite knowledge	Correlation coefficient (r)	.291**	.280**
	Significance (2-tailed)	.000	.000

** Correlation is significant at the 0.01 level (2-tailed).

Table 6: The best-fitting multiple regression model for participants' knowledge, practice, and attitude scores.

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95.0% Confidence Interval for B	
	B	Std. Error				Lower	Upper
(Constant)	26.678	.632		42.241	.000	25.43	27.92
Knowledge Score	.164	.051	.159	3.222	.001	.064	.264
r-square=0.25, Model ANOVA: F=10.83., p<0.001 Dependent Variable: Attitude score							
(Constant)	21.713	.525		41.321	.000	20.680	22.74
Knowledge Score	.211	.042	.242	4.990	.000	.128	.294
r-square=0.59, Model ANOVA: F=124.89., p<0.000 Dependent Variable: Practice score							

Table 7: Knowledge level of the participants according to their characteristics and risk factors.

Socio-demographic characteristics & risk factors	Total (N.402)	Knowledge level						χ^2	P
		Poor		Fair		Good			
		No	%	No	%	No	%		
Age (years)									
- 18-20	115	3	2.6	5	4.3	107	93.0	64.103	0.000*
- 21-23	86	6	7.0	40	46.5	40	46.5		
- >23	201	24	11.9	63.3	31.3	114	56.7		
Family income									
- < 5000	100	2	2.0	0	0.0	98	98.0	118.16	0.000*
- 5000-10000	157	28	17.8	73	46.5	56	35.7		
- > 10000	145	3	2.1	35	24.1	107	73.8		
Residence									
- Rural	75	0	0.0	0	0.0	75	100.0	49.81	0.000*
- Urban	327	33	10.1	108	33.0	186	56.9		
BMI									
- Underweight	28	3	10.7	6	21.4	19	67.9	26.037	0.000*
- Normal	186	16	8.6	65	34.9	105	56.5		
- Overweight	144	14	9.7	35	24.3	95	66.0		
- Obese	44	0	0.9	2	4.5	42	94.5		
Have you ever been diagnosed with gestational diabetes?									
- Yes	73	0	0.0	0	0.0	73	100.0	148.18	0.000*
- No	329	33	8.2	108	26.9	261	64.9		
Smoking status									
- smoker	13	0	0.0	3	23.1	10	76.9	2.4525	.658
- Non-smoker	380	33	8.7	102	26.8	245	64.5		
- Ex.smoker	9	0.0	3	33.3	6	66.7	96.3		
You have a mother, father, sister, or brother with diabetes.									
- yes	215	30	14.0	31	14.4	154	71.6	48.43	0.002*
- No	187	3	1.6	77	41.2	107	57.2		
Have you ever been diagnosed with an associated disease?									
- Hypertension	89	6	6.7	47	52.8	36	40.4	41.26	0.000*
- Cardiovascular disease	18	0	0.0	4	28.6	10	71.4		
- No	299	27	9.0	57	19.1	215	71.9		
Physically activity									
- Yes	268	2	0.7	16	6.0	250	93.3	284.79	0.000*
- No	134	31	23.1	92	68.7	11	8.2		
Do you eat high rich sugar food?									
- Yes	319	26	8.2	98	30.7	195	61.1	11.985	0.002*
- No	83	7	8.4	10	12.0	66	79.5		

Discussion

Prediabetes is an asymptomatic intermediate state of hyperglycemia with a significant risk of developing type 2 diabetes (T2D). It is a progressive condition; it can take a few years for patients to develop diabetes from a prediabetes state. Regarding risk factors, the current study found that around one-third (35.1% and 35.3%) respectively of the participants were normal weight and overweight; this finding is in the same line with **Aldossari et al (2018)**, who studied the Prevalence of Prediabetes, Diabetes, and Its Associated Risk Factors among Males in Saudi Arabia: A Population-Based Survey, and mentioned that 27.82% had normal BMI, 32.28% were overweight, and 36.22% were obese. Around 36% had higher waist circumference, >102 cm. Age, BMI, marital status, and educational attainment were statistically significant predictors for prediabetes and diabetes.

The current study added that; It was noted that about two-thirds of students (64.9 %) had a good level of knowledge about prediabetes in contrast to only 8.2 % who had a poor level of knowledge and statistically significant difference between participant knowledge and socio-demographic characteristics and risk factors, this finding is in agreement with **Postgraduate Centre for Preventive Medicine, et al. (2021)** who studied the community-based prediabetes knowledge assessment among Saudi adults in Al-Ahsa region, highlighted that 87.1% had a high level of knowledge of prediabetes, while 12.9% had low-to-moderate knowledge. 84% of males 40 years or older, 88.7% (384) of people with university or higher education, and 95.1% (78) of people who worked as health practitioners had high knowledge of prediabetes. Overall, age and prediabetes knowledge had a statistically significant association ($r = 5.006$, $p = 0.025$). Occupation also showed a significant statistical association with prediabetes knowledge ($r^2 = 9.85$, $p = 0.02$).

Additionally, the previous findings confirmed by **Donna et al. (2015)** examined the Assessment of College Students' Risk Level, Behaviors, Knowledge, and Attitude of Type 2 Diabetes at the University of Tampa. They added that students scored very high regarding their

attitude and knowledge of type 2 diabetes. Also, **Diallo et al. (2021)**, who investigated Diabetes Knowledge: What Do College Students Know, mentioned that the average percentage of students who correctly answered all five items of the General Knowledge of Diabetes subscale was 64.5%.

Regarding participants' attitude the total scores about prediabetes, the current study observed that the vast majority (92.3%) of the participants had a positive attitude toward prediabetes, compared to 2.0% only who had a negative attitude. Levels of practice of participants about prediabetes: most of the students (87.8%) had good practice toward prediabetes. In comparison (12.2.0%) of them had poor practice. These findings are in agreement with **Gazzaz (2020)**, who investigated the Knowledge, Attitudes, and Practices Regarding Diabetes Mellitus among University Students in Jeddah, Saudi Arabia, and added that 1190 (83.3%) participants had positive attitudes, while 238 (16.7%) had negative attitudes. More than half of the participants, 844 (59.1%), were practicing adequately for prevention.

The current study mentioned that 74.4% had no medical history for other health problems. Also, around half (51.5%) of participants did not practice physical activity. Finally (74.9%) of participants ate sugar food; this finding is consistent with **Badawy et al. (2023)**, who studied "Predictability of the Development of Insulin Resistance Based on the Risk Factors Among Female Medical Students at a Private College in Saudi Arabia," stated that the association of lifestyle risk factors with waist circumference as an indicator of IR was done where the majority of those with high waist circumference were physically inactive and more prone to stress which was statistically significant when compared to those with normal waist circumference. This aligns with **Suleiman, Ali, Salih, and Abdullah (2023)**, who studied the Prevalence of Insulin Resistance Among Apparently Healthy Medical Students of the College of Health and Medical Technology and found that those older than 25 are overweight and obese.

The current study revealed that there was a statistically significant difference between

participant knowledge and socio-demographic characteristics and risk factors (age, family income, residence, BMI, have diagnosed with gestational diabetes, having a mother, father, sister, or brother with diabetes, associated disease, physical activity and eat high rich sugar food ($p = 0.000^*$). This finding is contradicted by **Gazzaz (2020)**, who assessed knowledge, attitudes, and practices regarding diabetes mellitus among University Students in Jeddah, Saudi Arabia, and observed that females had significantly better general knowledge about DM, its risk factors, signs and symptoms, control and management, complications, and total knowledge scores. Our results showed that the female gender was associated with good knowledge and positive attitude, and relatives diagnosed with DM were associated with good knowledge scores.

The current study stated that 53.5% of them have a mother, father, sister, or brother with diabetes, and 74.4% had no medical history for other health problems. This finding is contradicted by **Grundlingh et al. (2022)**, who studied the Assessment of prevalence and risk factors of diabetes and prediabetes in South Africa and observed that the prevalence of prediabetes and diabetes was 67% and 22%, respectively. Among those who had never been tested for diabetes prior to the survey, 10% of females and 6% of males were found to be diabetic, and 67% of both males and females were found to be prediabetic.

Conclusions

The results of the present study revealed that 64.9 % of female students had a good level of knowledge about prediabetes & 92.3% of them had a positive attitude toward prediabetes, and 87.8% had a good practice toward prediabetes. Additionally, statistically significant positive correlations were found between firstly, students' knowledge and attitude ($r = .159$, $P = .001^*$). Secondly, between students' knowledge and practice ($r = .242$, $P = .000^{**}$). Statistically, there is an association between demographical characteristics toward health college, age, marital status, and knowledge of prediabetes among female health college students.

Recommendations

- There is a need for educational efforts to encourage students to modify health factors related to risk factors for prediabetes.
- Enhance knowledge about prediabetes according to risk factors through the educational curriculum.
- We highly recommend that public health professionals implement strategies for effective prediabetes screening, diagnosis, and management.
- Conduct the current study on a larger population and different geographical areas.

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