

Attitude and practice towards anemia among Saudi university students

Nasser Abdullah al-humaidi

Abstract:

Background: Anemia is the condition in which the hemoglobin level is low in the blood, its considered as one of the most important health problems, affecting people of all age-groups in both developing and developed countries.

Objective: To assess the attitude and practice toward anemia among Saudi university students.

Methods: The sample consisted of 312 Saudi university students were randomly selected, to fill electronic self-administered questionnaire through social media. The questionnaire contained three sections about; socio-demographic characteristics, attitude toward anemia, practice toward anemia. Collected data was coded and analyzed using statistical analysis program (SPSS v.22).

Results: The most of participants were males by 70.5%. The vast majority heard about anemia. The most 83.7% though that anemia is a serious problem, however, less than half had ever done a check to check their blood hemoglobin. 60.3% consume coffee, tea and soft drinks constantly, while 61.9% not consume fruits that contain vitamin C continuously, also, 92.6% don't take iron tablets constantly, significance level of participants' attitudes toward anemia according to gender, type of faculty and income level variables were higher than level 5%.

Conclusion: There was a good attitude towards anemia among Saudi university students, but there was poor practice towards anemia among them. There was no statistically significant differences in participants' practice toward anemia according to gender, type of faculty or income level.

Limitations: Narrow study time, lack of sufficient quantity of previous studies on the same issue.

Keywords: Anemia, Hemoglobin, Iron deficiency anemia, Nutritional factors, Non-nutritional factors, Red blood cells, University students.

1 INTRODUCTION

Anemia can be defined as the condition in which there is decrease in hemoglobin (Hb) levels to below the normal range of 13.5 gm/dl in men, 11.5 gm/dl in women, and 11.0 gm/dl in both of children and pregnant women (1). This decrease in level of hemoglobin is could be due to either little hemoglobin in each cell and/or few numbers of red blood cells (2). This reduces the available hemoglobin which supply body parts with sufficiency oxygen to work effectively (3). The symptoms and classical signs which seen in most anemic patients are results due to the oxygen deprivation. These signs and symptoms such as; early fatigue, pale skin, headache, chest pain, shortness of breath, signs of edema, general malaise, poor concentration and reduced work capacity (3,4). This adversely affects cognitive function, behavior, attention, regular activities and learning of students in general (4).

Anemia is an indicator of malnutrition and poor health. There are nutritional and non-nutritional factors could lead to anemia (2). Nutritional factors are represented by deficiency of intake of nutrients by cells. This nutrients includes iron, folic acid, vitamin C, vitamin B6, vitamin B12 and protein (5). Globally, iron deficiency anemia (IDA) is the main type of anemia. Whereas, about 50% of anemia cases are generally due to iron deficiency (6). Poor eating habits among university students represent a main public health concern. Eating outside the home, fast food and snack consumption and meal skipping, all of these habits make them exposed to dietary deficiencies (7).

While non-nutritional factors includes sex, age, stress, social class, helminthic infection, and certain intestinal diseases which affect how the body absorbs iron menstrual blood loss (4,5). Anemia adverse health consequences affect people of all ages (2,8), but it is more prevalent in young children and

pregnant women (8). In the youth group, anemia is more common among females than males, due to menstruation, pregnancy and lactation (9). Whereas, the average monthly menstrual blood loss is about 45 ml leading to loss of about 22mg of iron (10).

According to the World Health Organization (WHO), anemia belong to the ten most serious health problems (2). (WHO) reported that, anemia affects 1.62 billion people worldwide, which match to 24.8% of the population. The highest prevalence of anemia is in preschool-age children in the rate of 47.4 %. While, the lowest prevalence of anemia is in men in the rate of 12.7 % (8). In the developing countries, the prevalence of anemia is disproportionately high due to inadequate diet, poverty, pregnancy/ lactation, worm infestations and poor access to the health services (10). Anemia is at its peak in African Regions, South-East Asia and Eastern Mediterranean (4). When compared to other developing countries, in the Arab countries anemia appears to be a moderate public health problem in the rate of 20-39.9% (6). In the third world, iron deficiency anemia accounts for 75% of all types of anemia, affecting 30% of population (3). It was found that iron deficiency anemia is the most common type of anemia in the Arab countries (6). In Saudi Arabia the overall country prevalence of iron deficiency anemia was 30-56% (5). The available data on anemia from Saudi Arabia are limited (11).

So this study was conducted to assess the attitude and practice toward anemia among Saudi university students.

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2 OBJECTIVES

2.1 General Objective

To increase students' awareness of anemia and improve their attitude and practices to avoid anemia.

2.2 Specific Objectives

- To assess the attitude and practice towards anemia among Saudi university students.
- To show the relationship between the gender and the practices toward anemia.
- To show the relationship between the income level and the practices toward anemia.
- To show the relationship between the type of faculty and the practices toward anemia.

3 SUBJECTS AND METHODS

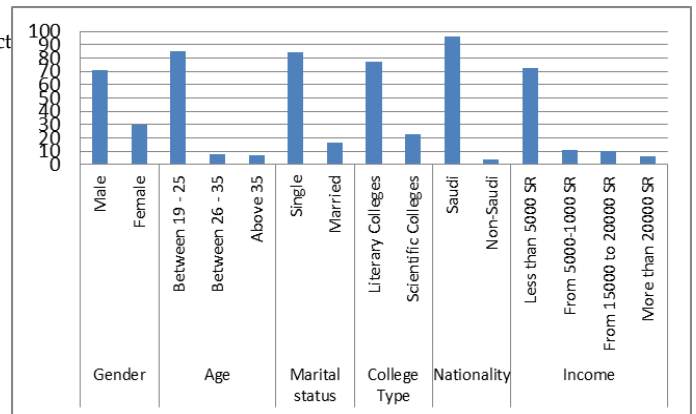
A cross-sectional study was conducted through a random sampling, to assess the attitude and practice toward anemia among Saudi Arabia university students. During the period from 10, Aug 2017 to 10, Sep 2017. Data was collected by electronic self-administered questionnaire. Which was published to Saudi university students through social media. A representative sample of around 312 participants living in various area of Saudi Arabia was selected randomly. The questionnaire included university students of both genders from literary and scientific colleges in different regions of the KSA. All questionnaires that do not belong to university students have been excluded.

The questionnaire contained three sections. The first section was about socio-demographic characteristics which will include age , gender , marital status, nationality, income level. While second section was include the questions regarding the attitude toward anemia. And third section was include questions regarding the practice toward anemia like the nature of the participants' diet, intake iron supplements and exercise. Collected data was coded and analyzed using statistical analysis program (SPSS v.22), in addition to using of necessary statistical methods to achieve the objectives of the study including frequencies, percentages, and graphs.

4 POPULATION & SAMPLE OF THE STUDY

The study population includes all Saudi students, a random sample size (312) Student was selected; the following table shows their characteristics according to their personal data.

Figure 1
The participants personal data



5 DATA COLLECTION TOOL (QUESTIONNAIRE)

The questionnaire was contain three sections. The first section is about socio-demographic characteristics which will include age , gender , marital status, nationality, Income level. While second section will include the questions regarding the Attitude toward anemia. And the third section will include questions regarding the practice toward anemia like the nature of the participants' diet, intake iron supplements and exercise.

6 RESULTS

6.1 Attitudes towards anemia

The next table shows the participants' distribution according to their hearing about anemia. Where 99.4% heard about anemia, while 0.6 did not heard about anemia.

Table 1
shows the participants' distribution according to their hearing about anemia.

	Frequency	Percent
Yes	310	99.4
No	2	.6
Total	312	100.0

The next table shows the participants' distribution according to their belief whether anemia is a serious problem. Where 83.7% of them believe that the anemia is a serious problem, while 16.3% don't believe it.

Table 2
shows the participants' distribution according to their belief whether anemia is a serious problem.

	Frequency	Percent
Yes	261	83.7
No	51	16.3
Total	312	100.0

The next table shows the participants' distribution according to their view of the group most susceptible to anemia ,Where 81.1% of respondents believe that pregnant women are more likely to Injury anemia, while 14.7% of the participants believe that Pre-school children are more likely to Injury anemia, and 4.2% of them believe that men are more likely to Injury anemia.

	Yes		No		P-value
	N.	%	N.	%	
Have you ever done a check to check your blood hemoglobin?	147	47.1	165	52.9	0.308
Do you consume coffee, tea and soft drinks constantly?	188	60.3	124	39.7	0.000**
Do you eat fruits that contain vitamin C continuously?	119	38.1	193	61.9	0.000**

Table 3

	Yes		No		P-value
	N.	%	N.	%	
Do you think it is difficult to prepare iron-rich foods?	52	16.7	260	83.3	0.000**
Do you find that iron-rich foods are delicious?	264	84.6	48	15.4	0.000**

shows the participants' distribution according to their view of the group most susceptible to anemia.

	Frequency	Percent
Pregnant women	253	81.1
Pre-school children	46	14.7

Men	13	4.2
Total	312	100.0

From the following table, 16.7% of them believe that it is difficult to prepare foods rich in iron, and 84.6% of them find that iron-rich foods are delicious.

Table 4

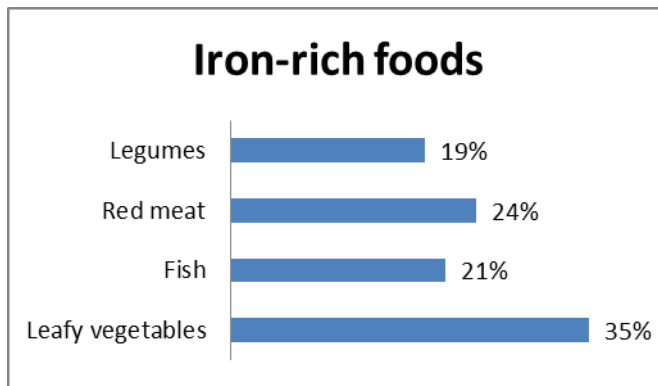
shows participants' attitudes towards anemia.

Chi-squared test: **Significant at 0.01

The next figure shows the participants' distribution according to their knowledge of iron-rich foods.

Figure 2

shows the participants' distribution according to their knowledge of Iron-rich foods.



6.2 Practices towards anemia

It is clear from the following table: 47.1% of the participants have already examined the proportion of hemoglobin in the blood, And 60.3% of them replied that they consume coffee, tea and soft drinks constantly, And 38.1% eat fruits that contain vitamin C continuously.

Table 5

shows the participants' distribution according to each of the / Hemoglobin blood test, consumption of coffee, tea and soft drinks, consumption of fruits rich in vitamin C.

The next table shows the participants' distribution according to the average consumption of foods rich in iron, We note that 43.6% of them consume iron-rich foods twice a week, 32.4% of them consume iron-rich foods 4-5 times a week, and 24% consume iron-rich foods once a week.

Table 6

shows the participants' distribution according to the average consumption of foods rich in iron.

	Frequency	Percent
4-5 times a week	101	32.4
Twice a week	136	43.6
Once a week	75	24.0
Total	312	100.0

It is clear from the following table: 7.4% of them eat iron tablets constantly, And 30.1% of them regularly exercise, Finally note that the vast majority of participants are non-smokers.

Table 7

shows the participants' distribution according to each of / eating breakfast, eating iron tablets, exercise, smoking.

	Yes		No		P-value
	N.	%	N.	%	
Are you interested about eating breakfast?	173	55.4	139	44.6	0.054
Do you take iron tablets regularly?	23	7.4	289	92.6	0.000**

Do you exercise sports continuously?	94	30.1	218	69.9	0.000**
Are you a smoker?	26	8.3	286	91.7	0.000**

Chi-squared test: **Significant at 0.01

7 TEST HYPOTHESES

Hypotheses 1

"There are statistically significant differences in participants' practice toward anemia according to sex variable".

Table 8

T-test result; to test the first hypothesis.

Previous table shows (T-test) result to verify the existence of statistically significant differences in participants' practice toward anemia according to sex variable, where we note that significance level is 0.658 which is larger than level 5% thus conclude that there is no difference in participants' practice toward anemia according to sex variable.

Hypotheses 2:

"There are statistically significant differences in participants' practice toward anemia according to type of faculty".

Table 9

T-test result; to test the second hypothesis.

Type of faculty	Mean	Std. Deviation	T-test	Sig
Literary	1.64	0.199	0.746	0.456
Scientific	1.44	0.192		

Previous table shows (T-test) result to verify the existence of statistically significant differences in participants' practice toward anemia according to type of faculty, where we note that significance level is 0.456 which is larger than level 5% thus conclude that there is no difference in participants' practice toward anemia according to type of faculty.

Hypotheses 3:

"There are statistically significant differences in participants' practice toward anemia according to Income level".

Table 10

ANOVA-test result; to test the third hypothesis.

Income level	Mean	Std. Deviation	F-test	Sig
Less than 5000 SR	1.66	0.190	0.800	0.495
From 5000-1000 SR	1.61	0.226		
From 15000 to 20000 SR	1.63	0.232		
More than 20000 SR	1.65	0.198		

Previous table shows (F-test) result to verify the existence of

statistically significant differences in participants' practice toward anemia according to Income level, where we note that significance level is 0.495 which is larger than level 5% thus conclude that there is no difference in participants' practice toward anemia according to Income level.

8 Discussion

The available data on anemia from Saudi Arabia are limited (11), as well as literature focusing on women and children, so data about anemia among youth is scarce (5). Therefore, this study was conducted to evaluate the attitude and practices towards anemia among university students in Saudi Arabia.

Gender	Mean	Std. Deviation	T-test	Sig
Female	1.65	0.195	0.443	0.658
Male	1.64	0.206		

This study included 312 Saudi university students, they were aged 19 and over, but the most 85.3% were between 19 - 25 years old.

The present study revealed a good attitudes among university students towards anemia, this is expected because we are talking about an educated class, university students in KSA. This result compatible with Abu-Hasira who found a good attitudes among pregnant women towards iron deficiency anemia (12), this good attitudes may be due to the fact that pregnant women are among the most vulnerable to the anemia and therefore are educated about anemia, also UNRWA it works to educate mothers in Palestine in particular, especially towards anemia, because it is a country that is very prone to anemia. But our result not compatible with Angadi et al. study which showed poor attitude toward anemia among adolescent girls in Karnataka (9), this conflict in results may be due to the difference in the nature of the target group in terms of age and level of education.

Anemia is associated with increased child morbidity and mortality, perinatal mortality, immune incompetence, impaired mental development, decreased performance at work, and increased tendency to lead poisoning (13). Also, anemia affects cognitive function, behavior, attention, regular activities and learning of students of all ages (4). As well as, anemia lead to a lot of adverse outcomes among older adults such as; reduced quality of life, depression, higher risk of Alzheimer disease, decreased strength of muscle, increased disability and congestive heart failure (14). In the current study the most of participants 83.7% considered anemia as a serious health problem, this higher than results of study conducted by Jose et al. who found that 45.4% considered anemia as a serious health problem (15). The difference in results may be due to differences in the nature of the target group in both studies.

For the most vulnerable group to anemia, most participants 81.8% thought that pregnant women were the most vulnerable to anemia. but the World Health Organization (WHO), reported that the highest prevalence of anemia is in preschool-age children by 47.4 % around the world (8).

Also, the most of our participants 83.3% thought that it's not

difficult to prepare iron-rich food, and 84.6% liked the taste of the iron rich foods, these results are reassuring. But when participants were asked about iron-rich foods, their choices were leafy vegetables, red meat, fish and Legumes by 35%, 24%, 21%, 19% respectively, these proportions are lower than expected.

This study demonstrated poor practice towards anemia among Saudi university students. This results like Also, Raksha & Shameem study in Mangalore, India who found poor practice among most of the child bearing women (16). As well as, Mirzoyan found Similar results (17). While Abu-Hasira found at her study good practice towards iron deficiency anemia (12). The reason may be as we mentioned earlier that pregnant women are among the most vulnerable to the anemia and therefore are interested in good practices with regard to iron deficiency anemia, as well as the follow-up of UNRWA institutions to the majority of pregnant women and their continuing education in relation to iron deficiency anemia.

More than half 52.9% of our participants had never done a check to check their blood hemoglobin. This is a significant proportion of concern that all these people have never done a screening test to check the hemoglobin ratio on their own. Also, the majority of participants 60% consume coffee, tea and soft drinks constantly. Most of studies have found no relationship between coffee and tea intake and iron status (18). While, Rossander et al. found that tea reduced the iron absorption to less than half (19). But review by Temme and van Hoydonck (2002) concluded that in populations who mostly have adequate iron status the tea consumption does not appear to affect iron status, but in populations with marginal iron status, here appears to be a negative association between iron status and tea consumption (20). Regarding vitamin C consumption, the majority of our participants (61.9) didn't consume fruits that contain vitamin C continuously. The enhancement of iron absorption from vegetable meals is directly proportional to the quantity of ascorbic acid (vitamin C) present (21). Rossander et al. found that orange juice increased the absorption two and a half times (19).

More than half of our participants 69.9% do not practice exercise continuously. Strenuous exercise appears to signal increased absorption of iron and to stimulate the redistribution of storage iron. This mobilization of iron during exercise may be directed towards the enhancement of oxygen-accepting ability in muscles at work (22). The prevalence of smoking among participants in this study was only 8.3%. This is considered reassuring because smoking causing disorders of iron metabolism, hemoglobin formation, red blood cell metabolism, which leads to the development of anemia (23).

The most of our participants 70.5% were males while 29.5% were females, according to our results there was no statistically significant differences in participants' practice toward anemia according to gender variable. Although females are more susceptible to anemia than male because of menstruation, pregnancy and childbirth, this has not affected their practice to avoid anemia. Also, there was no statistically significant differences in participants' practice toward anemia according to type of faculty or income level.

9 Conclusion

There was a good attitude towards anemia among Saudi university students, but there was poor practice towards anemia among them. This means that there is a need to improve student practices towards anemia. Also, There was no statistically significant differences in participants' practice toward anemia according to gender, type of faculty or income level. And therefore, Saudi university students' practice towards anemia didn't affected by gender, type of faculty or income level.

10 LIMITATIONS

- narrow study time
- Lack of sufficient quantity of previous studies on the same issue.

11 RECOMMENDATION

- Conduct awareness campaigns and workshops to raise awareness of anemia and its effects on current and future human health and how to avoid it.
- The role of media and social media in raising awareness about anemia must be enhanced.
- Urge students to regularly check their hemoglobin level.
- Work to reduce fast food among students.
- Students should be encouraged to take a healthy diet rich in iron, other minerals and vitamins.
- Motivate students to exercise, at least practice walking or using stairs instead of an elevator.
- Urge students to reduce the consumption of tea and coffee and soft drinks and replace them with juices, especially orange juice, which increases the activity of students, such as coffee and tea.
- Warning students of the harm of smoking and its role in increasing the risk of anemia

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