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Original Research Article

General population awareness regarding iron deficiency anaemia and its relation with nutrition and dietary habits

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ABSTRACT

Background: Iron deficiency anaemia is considered as a significant public health problem in vulnerable groups especially adolescents. This necessitates the importance of awareness about the disease among general population. Also, public awareness regarding the significance of iron deficiency and its effect upon work performance, and the importance of providing iron during pregnancy and childhood is a mandatory health issue. Policy makers should focus their strategy right from adolescence beginning with raising awareness about iron deficiency anaemia.
Methodology: A descriptive cross-sectional approach was applied targeting all population in Aseer region who aged 18 years or more from January 2020 to April 2020. Data were collected using online questionnaire through social media.
Results: The survey respondents were 537 persons whose ages ranged from 18 to 89 years old with mean age of 32.1 12.2 years. Three hundred participants (55.9%) were males and 84.7% of them were at urban area. More than 70% of the respondents previously heard about Anaemia and 88.8% agreed on that anaemia is health problem. Iron as the nutrient deficient in anaemia was reported by 78.6% of the participants and 69.1% reported that in anaemia there is decreased haemoglobin level. Generally, about half of the participants had good awareness level regarding all aspects of IDA.
Conclusions: the study revealed that the recorded awareness level regarding IDA was considerable with many areas of defect. The main areas of awareness defect included iron rich food and absorption inhibitors which indicates the urgent need for further effort to raise the population awareness and improving their nutritional habits

Keywords: Iron deficiency anaemia, Anaemia, Iron deficiency, Nutritional anaemia, Awareness, Knowledge, Dietary habits.

INTRODUCTION

Anaemia is a clinical condition where there is low haemoglobin concentration. According to World Health Organization, anaemia is well-defined as haemoglobin levels under 13.0 g/dl for males and 12.0 g/dl for females. [1] Worldwide, it affects 43% of children below five years of age, 29% of non-pregnant females (aged 15-49 years), and 38% of pregnant females. [1, 2] The major areas of distribution include central and west Africa (71%, 48%, and 56%, respectively). There are many consequences for anaemia including poor general health status, poor quality of life, mood and psychological disturbance, poor educational achievement among students and poor pregnancy outcome among pregnant females [3] Causes of anaemia are multifactorial, especially within sub-Saharan Africa where iron deficiency may be associated with malaria, helminthiasis, schistosomiasis, hemoglobino-

pathies, and deficiency of other micronutrients. [4,5] Chronic infection and inflammation may additionally be probable reasons.[6]

Iron deficiency anaemia (IDA) remains the most recorded type of anaemia especially among those with gastrointestinal disorders. [7,8,9] Cases of iron deficiency anaemia usually have poor quality of life, long lasting morbidity which is a main source of burden. [10,11,12] Even without anaemia, iron deficiency can be debilitating, exaggerate other chronic health problems with considerable morbidity and mortality.[13] The main apparent symptoms of IDA include fatigue, pale skin, and brittle nails, craving non-food items such as dirt, clay, and ice.[14,15] However, the symptoms of iron deficiency can manifest in different ways; they are hard to pinpoint and can be associated with several other health conditions.[16]

Population awareness regarding all these items of iron deficiency anaemia including causes, signs and symptoms, preventive measures is crucial for early detection and management of these cases before being clinically apparent.[17] Also Public awareness regarding the significance of iron deficiency and its effect upon work performance, and the importance of providing iron during pregnancy and childhood is a mandatory health issue.[18] To help people around the world get iron informed, Iron Deficiency Day 2018 has developed a range of information and materials to help people understand iron deficiency and iron deficiency anaemia and a Symptom Checker to help people recognise the numerous but varied symptoms. The Symptom Checker lists the main symptoms associated with iron deficiency and iron deficiency anaemia and brings them to life with an animated character, to further explain each symptom. The current study aimed to assess population awareness regarding iron deficiency anaemia, and to know the extent of population awareness regarding its relationship with dietary habits in Aseer region, southern of Saudi Arabia.

METHODS

A descriptive cross-sectional study design was applied targeting all population in Aseer region, Southern of Saudi Arabia during the period from January 2020 to April 2020. People who aged 18 years or more and living permanently in Aseer region were included. New residents (for less than 1 years) and those with incomplete survey answers were excluded. Data were collected using online questionnaire through social media. Questionnaire was developed by the researchers after intensive literature review and expert's consultation. Questionnaire covered data for participants' demographic characteristics, medical and family history, check-up practice and IDA anaemia awareness. Awareness items covered definition, causes, signs and symptoms, effect and food rich in iron. A pilot study including 50 participants was conducted to assess for the tool validity and reliability. Three experts reviewed the tool and all suggested modifications were discussed and applied if there was consensus. Reliability coefficient for the tool (Cronbach's alpha) was 0.75. After finalizing the tool, it was published on social media and general population were invited to fill the questionnaire then data were exported for analysis using statiscal software after data filtering and validation. The study was approved by Ethical Committee of the Scientific Research, King Khalid University and approval number was (ECM#2019-118)—(HAPO-06-B-001).The convenient people who fulfilling the inclusion criteria during the study period were included consecutively based on convenient sampling method which used due to the current lockdown and lack of physical contact due to COVID-19 pandemic.

Statistical analysis

After data filtering for errors, it was fed to statistical package of social science (SPSS) version 24. All statistical methods based on two tailed tests. P value less than 0.05 was considered to be statistically significant. As for awareness, each correct answer was scored with one point and the overall discrete scores for the different items were summed together. The final score was categorized into poor awareness for those who had score less than 50% of the maximum (less than 12 points). Good awareness was considered in case of having 12 points or more. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, medical history, and awareness and attitude items. Univariant relations between participants' personal data and their awareness level were assessed using Persons chi-square test.

RESULTS

Survey respondents were 537 persons whose ages ranged from 18 to 89 years old with mean age of 32.1-12.2 years.

Table 1: Personal data of survey participants in Aseer region, Southern Saudi Arabia.

Demographic data		No.	Percentage (%)
Age in years	<30 years	276	51.4
	30-39	107	19.9
	40+	154	28.7
Gender	Male	300	55.9
	Female	237	44.1
Residence	Urban area	455	84.7
	Rural area	82	15.3
Educational level	Below secondary	25	4.7
	Secondary school	93	17.3
	College/ university	419	78.0
Social level	Poor	24	4.5
	Intermediate	82	15.3
	Good	431	80.3
Family history of anaemia	Yes	295	54.9
	No	170	31.7
	Don't know	72	13.4

Three hundred participants (55.9%) were males and 84.7% of them were at urban area. University level of education was recorded for 78% of the respondents and 80.3% had good social level. Family history of anaemia was recorded among 54.9% of the participants (Table 1).

Regarding participants' awareness of IDA, table 2 demonstrates that 77.1% of the respondents previously heard about Anaemia and 88.8% agreed on that anaemia is health problem. Iron as the nutrient deficient in anaemia was reported by 78.6% of the participants and 69.1% reported that in anaemia there is decreased haemoglobin level. As for signs and symptoms, Tiredness/body weakness was recorded by 86.2% of the participants followed with Shortness of breath (28.9%) and Irregular menstrual cycle (25.9%). Considering effect of anaemia, 67.6% of the participants' selected Decreased wok capacity followed with Impaired on growth and development (46.9%) and Learning difficulties (22.7%). On asking about preventive measures of anaemia, having iron-rich food was selected by 81% of the participants followed with taking IFA tablets (61.8%). Green leafy vegetables were reported by 57% of the participants as an iron rich food while Meat, poultry was reported by 41% of the respondents. Tea as the main factor which inhibits iron absorption was reported by 68.5% of the participants followed with coffee (33.3%). Generally, 280 participants (52.1%) had good awareness level regarding of IDA.

Table 2: Awareness of general population regarding different items of IDA, Aseer region, Southern Saudi Arabia.

Awareness regarding IDA		No	Percentage (%)
Heard about iron deficiency anaemia	Yes	414	77.1
	No	123	22.9
Anaemia is health problem	Yes	477	88.8
	No	10	1.9
	Don't know	50	9.3
In anaemia there is	Increased red blood cells	11	2.0
	Decreased haemoglobin	371	69.1
	Don't know	155	28.9
Nutrient deficient in anaemia	Iodine	20	3.7
	Iron	422	78.6
	Calcium	26	4.8
	Don't know	69	12.8
Causes of anaemia	Worm infestation	50	9.3
	Poor diet	465	86.6
	Excessive bleeding	226	42.1
	Overeating	11	2.0
	Don't know	67	12.5
Signs and symptoms of anaemia	Tiredness/body weakness	463	86.2
	Irregular menstrual cycle	139	25.9
	Impact learning process	58	10.8
	Shortness of breath	155	28.9
	Fever	31	5.8
	Don't know	71	13.2
Effects of anaemia	Impaired on growth and development	252	46.9
	Learning difficulties (school performance)	122	22.7
	Decreased wok capacity	363	67.6
	Don't know	104	19.4
Preventive measures of anaemia	Having iron-rich food	435	81.0
	Personal hygiene	19	3.5
	Taking IFA tablets	332	61.8
	Overeating	9	1.7
	Don't know	65	12.1
Iron-rich food	Green leafy vegetables	306	57.0
	Legumes	164	30.5
	Meat, poultry	220	41.0
	Don't know	116	21.6
Factors inhibit iron absorption	Tea	368	68.5
	Coffee	179	33.3
	Vitamin C	40	7.4
	Don't know	135	25.1

Table 3: Participants' Factors related to their awareness level regarding IDA, Aseer region, Southern Saudi Arabia.

Factors		Awareness level				P value
		Poor (n=257)		Good (n=280)		
		No.	Percentage %	No.	Percentage %	
Age in years	< 30 years	155	56.2	121	43.8	0.001*
	30-39	35	32.7	72	67.3	
	40+	67	43.5	87	56.5	
Gender	Male	188	62.7	112	37.3	0.001*
	Female	69	29.1	168	70.9	
Residence	Urban area	213	46.8	242	53.2	0.253
	Rural area	44	53.7	38	46.3	
Educational level	Below secondary school	17	68.0	8	32.0	0.001*
	Secondary School	61	65.6	32	34.4	
	College/ University	179	42.7	240	57.3	
Social level	Poor	13	54.2	11	45.8	0.396
	Intermediate	44	53.7	38	46.3	
	Good	200	46.4	231	53.6	
Family history of anaemia	Yes	121	41.0	174	59.0	0.001*
	No/ don't know	136	56.2	106	43.8	
Frequency of visiting doctor and specialists for check-up	Never	139	56.5	107	43.5	0.002*
	Every 2-3 year	51	41.1	73	58.9	
	Annually	36	43.4	47	56.6	
	Every 1-6 months	31	36.9	53	63.1	

P: Pearson's X^2 test, * P < 0.05 (significant).

Table 3 demonstrates the distribution of participants' awareness level regarding IDA according to their characteristics. Good awareness was recorded among 56.5% of those who aged 40 years or more compared to 43.8% of those who were below the age of 30 years with recorded statistical significance (p=0.001). Also 70.9% of the female participants had good awareness level compared to 37.3% of males (p=0.001). As for education level, 57.3% of participants with university level of education had good awareness level compared to 32% of those with lower level of education (p=.0001). Also 59% of participants with family history of anaemia had good awareness level compared to 43.8% of those with negative family history (p=0.001). Participants who used to perform check-up periodically every 6 months or less had significantly higher awareness level than those who never do it (63.1% vs. 43.5%; p=0.002).

Regarding source of participants' knowledge regarding IDA (Figure 1), Media was the most recorded source (77.1%) followed with medical staff (67.7%), family members (44.3%) while their own study was recorded among 17.9%.

Finally, 45.8% of the participants never seek for medical check-up while 15.6% do it every 1-6 months. Also 85.1% of the participants asked for more information about iron deficiency anaemia and its impact.

Table 4: Participants attitude and practice regarding IDA, Aseer region, Southern Saudi Arabia.

Attitude and practice regarding IDA	No.	Percentage %
Frequency of visiting doctor and specialists for check-up		
Never	246	45.8
Every 2-3 year	124	23.1
Annually	83	15.5
Every 1-6 months	84	15.6
Would you like to get more information about iron deficiency anaemia?		
Yes	457	85.1
No	80	14.9

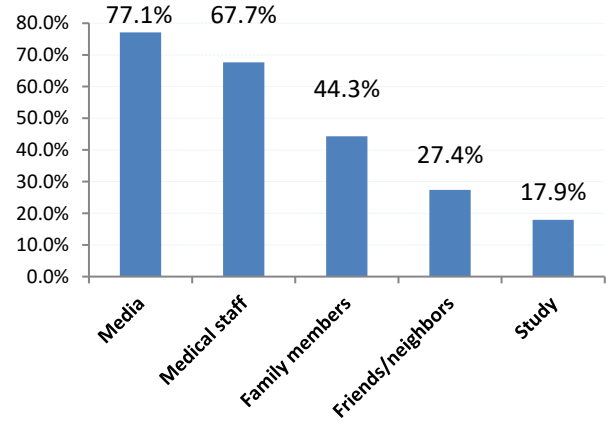

Figure 1: Source of Awareness regarding IDA among general population in Aseer Region, Southern Saudi Arabia.

DISCUSSION

Iron deficiency, and specifically iron deficiency anaemia (IDA), is one of the most frequent and significant nutritional deficiencies globally[19] Iron deficiency anaemia affects all ages and categories.[20,21] Iron deficiency impairs the cognitive development of children from infancy through to adolescence. It badly affects immune system and is associated with increased morbidity rates.[22] The prevalence of the IDA as one of the most significant health problems was varying according to age category, region and gender.[23] In 2015, Iron deficiency anaemia affected about 1.48 billion people.[24] A lack of dietary iron was the most recorded factor behind among nearly half of all anaemia cases globally.[25] Women and young age groups were the most vulnerable categories.[26] In 2015, anaemia due to iron deficiency resulted in about 54,000 deaths – down from 213,000 deaths in 1990.[27]

The current study aimed to assess the awareness of iron deficiency anaemia among general population in Aseer region, Southern of Saudi Arabia. The study revealed that more than half of the participants had good awareness level regarding all items of iron deficiency anaemia. The highest level of awareness was for causes of anaemia, signs and symptoms, and their concept regarding seriousness of this chronic health problem. The lowest level of awareness was recorded for factors which may inhibit iron absorption and for iron rich food. As for the predictors for participants' awareness, young age, female gender, high education, family history of anemia, and periodic checkup within short intervals was the most recorded factors. Media was the most frequent source of knowledge followed with medical staff especially among those who seek for periodic check-up. This can explain the vital role of media by all its areas including social media, TV and programs in improving general population awareness level.

A study was conducted by Jalambo et al, to assess the nutritional knowledge, attitude and practices regarding Iron Deficiency Anaemia (IDA) among female adolescents in Gaza Strip, Palestine.[28] The study revealed that 84% of the adolescents could not identified persons with anaemia. About 81.3% of them had poor awareness regarding the consequences of IDA among pregnant women and 91.6% don't know about the causes of IDA. Also, 89% did not know which iron-rich foods can be easily absorbed, and 74.8% unaware of factors which reduce iron absorption. Another study was conducted in Mahila college of Bhavnagar to assess awareness regarding nutrition and anaemia amongst young college going students and to assess the impact of health awareness programme on knowledge of nutrition and anaemia.[29] The researchers reported that only 13.2% young college girls were aware about nutritious diet is Balanced diet which contains all nutrients required for growth and development of body before health education. Also, only 33.8% young college girls knew that lack of nutritious diet results in malnutrition, anaemia and vitamin deficiencies. Locally in Saudi Arabia, a study was conducted to assess awareness of anaemia causes among Saudi population in Qassim region, 2013.[30]

The authors reported that general awareness of anaemia was 89.2%. Drinking tea, eating fava bean and pregnancy as anaemia causes in both male and female were highly recorded. The high awareness level is consistent with the current study finding which may be explained by that most of the participants were highly educated with high social level while others with low social level or no educated were not available for the current online survey which need educational and economic ability for filling the tool and this is the main point of weakness in this survey but due to the nature of Saudi community, home to home or community based approaches for data collection is very difficult especially in the southern region due to traditions and culture.

Study limitation

As the study is community bases, the noisiest limitation was that the sample was internet based through social media which may not be well representative for the study community affecting the generalizability of the study results (external validity). Also, participants will be those who can read and write and have smart phones and illiterate people and poor with no smart phone and internet accessibility will not participate which may overestimate the true awareness level. But authors are forced to use this method for data collection due to worldwide protective measures and lockdown due to COVID-19 pandemic.

CONCLUSION

In conclusion, the study revealed that more than half of the general population in Aseer region had good awareness level regarding iron deficiency anaemia for all aspects including causes and preventive measures. There was defect in some items especially iron rich food and absorption inhibitors which indicates the urgent need for further effort to raise the population awareness and improving their nutritional habits. This can be achieved through mass media and social media as they were the most efficient sources of knowledge. Also, more effort should be paid to establish a larger scale community-based survey covering those who are out of reach with electronic surveys for better mapping the awareness and practice image.

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Conflict of interest: None declared
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