

Assessment Knowledge about Anaemia among Elderly Patients Attending at Primary Health Care at Saudi Arabia 2022

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Abstract

Background: Anemia is an extremely common problem in the elderly, and next to anemia of chronic disease, iron deficiency is the most common cause. Iron-deficiency anemia is important to diagnose because appropriate iron therapy may improve symptoms, inappropriate iron therapy may cause clinically important side effects, and iron deficiency may be a marker for occult gastrointestinal pathology, despite its high prevalence anemia often does not receive proper clinical attention, and detection, evaluation, and management of iron deficiency anemia and iron-restricted erythropoiesis can possibly be an unmet medical need especially the elderly. A multidisciplinary panel of clinicians with expertise in anemia management convened and reviewed recent published data on prevalence, etiology, and health in the elderly implications of anemia as well as current therapeutic options and available guidelines on management of anemia across various patient populations and made recommendations on the detection, diagnostic approach, and management of anemia.

Aim of the study: To Assessment Knowledge about Anaemia among elderly patients attending at Primary Health Care, in Saudi Arabia 2022

Methods: across-sectional study was conducted in primary healthcare centers among elderly patients attending at Primary Health Care who visited clinic for routine follow-up were selected through convenience sampling technique. A questionnaire filled out by the researcher through an interview with the elderly patients was utilized for data collection. **Results:** most of the participants (47.0%) were in the age group < 65 years follow by the (33.0%) the gender the

majority of participant male were (51.0%), marital status the majority of participant Single were (58.0%) while married were (30.0%), educational level the majority of participant are primary education were (29.0%), nationality the majority of participant are Non-Saudi were (55.0%), economic level the majority of participant <10.000 were (67.0%). **Conclusion.** In a general geriatric medical population such as ours, with a prevalence of iron deficiency of 36%, appropriate use of serum ferritin determination would establish or refute a diagnosis of iron deficiency without a bone marrow aspiration in 70% of the patients. Anemia is highly prevalent in adolescents, adults, and the elderly in Makkah region. -e most common cause is thought to be iron deficiency, although other causes are not uncommon. -e authorities need to address the problem of prevention and reduction in anemia prevalence by taking elective measures and interventions in geriatric.

Keywords: Knowledge, Anemia, Clinic, elderly, PHC

Introduction:

Anemia, defined as a decreased concentration of blood hemoglobin, is one of the most common nutritional deficiency diseases observed globally and affects more than a quarter of the world's population [1]

Anemia in older persons is particularly relevant as it has a number of serious consequences. It is associated with higher incidences of cardiovascular disease [2] and cognitive impairment [3], decreased physical performance and quality of life [4], increased risk of falls, fractures, impaired muscle strength [5] and dementia [6], increased hospital admission and longer duration of hospitalization [7]. It has also been highlighted in the literature that anemia is associated with disabilities in activities of daily living (ADL) among hospitalized older persons [8]. The burden of disability is noted to increase in chronic diseases and aging populations [9]. Furthermore, the presence of anemia is significantly associated with longer hospital stays [10]. Chronic diseases such as diabetes mellitus and chronic kidney disease, which are prevalent among older persons, are also associated with anemia [11]. Anemia is one of the most common nutritional deficiency diseases observed globally and affects more than a quarter of the world's population. [12] Globally, The prevalence of anemia among the older persons was 35.3% (95% CI: 33.1, 37.4). Among the older persons with diabetes, hypertension and hypercholesterolemia, the anemia prevalence rates were 38.6%, 35.3% and 34.1%, respectively. [13] The prevalence of anemia in Saudi Arabia was 32.3% in the 60–69 year age group; 45.0% in the 70–79 year age group, and 56.2% in participants > 80 years. The majority (84.4%) had mild anemia, while 13.3% had moderate and 0.02% had severe anemia [14]

Our interest in the investigation of iron deficiency in the elderly was stimulated by a clinical impression that application of cutoff points for laboratory tests for the diagnosis of iron deficiency derived from younger populations was misleading in a geriatric population. There are a number of reasons why results found in younger populations may not apply to the elderly. The iron-binding capacity decreases with aging [15], and is affected by factors such as malnutrition and chronic disease, which have a higher prevalence in the elderly [16] Serum ferritin levels increase with aging and may be elevated by acute and chronic inflammatory conditions [17]

Anemia is common in the elderly and its prevalence increases with age. Using World Health Organization criteria for anemia (hemoglobin of less than 12 g per dL [120 g per L] in women

and less than 13 g per dL [130 g per L] in men), the prevalence of anemia in the elderly has been found to range from 8 to 44 percent, with the highest prevalence in men 85 years and older.[18]

Review of literatures

Cohort studies of the elderly have found that the two most common causes of anemia in the elderly are chronic disease and iron deficiency . In 15 to 25 percent of elderly patients with anemia, no cause is found; even when no cause is found the prognosis is good[19].

Study in Saudi Arabia reported that health services to older people aged 60 years and above are provided at primary health care centers (PHCCs) through the Older People Health Care Program (OPHCP) since 2012, when the program was established. This program is the first step obtained by the Saudi Ministry of Health (MOH) to improve the health services as a response to meet the health demands of the older people and introduce the geriatric health services in MOH health institutes. [20]. Since the services are provided at the PHCC level, the main scope of these services is preventive as well as curative for chronic diseases usually managed at PHCCs. The preventive services include CGA, health education to older people and their caregiver, and immunization. The aim of CGA is to detect the common health conditions among older people targeted by the program. [21]

Study reported that the increased incidence of anemia with aging has led to speculation that lower hemoglobin levels may be a normal consequence of aging. However, there are at least two reasons for considering anemia in the elderly as a sign of disease. First, older people maintain a normal red cell count, hemoglobin and hematocrit. Second, in most elderly patients an underlying cause of anemia is found for hemoglobin levels of less than 12 g per dL.[22]. Another study demonstrated that the prevalence of anemia among older persons aged 60 years and above was 35.3%. This finding was attributed to the higher prevalence of co-morbidities, such as hypertension, diabetes and chronic kidney disease, in the older population [23]

Additionally, anemia in older persons in Malaysia was associated with Indian and Malay ethnicities, increasing age, hospitalization and diabetes in a prior study by Yusof, et al. [24] Chronic disease profiling showed that the prevalence rates of anemia in the older persons with diabetes, hypertension and hypercholesterolemia were 38.6%, 35.3% and 34.1%, respectively. However, only diabetes remained significant in the multivariate analysis. The older persons with diabetes were more likely to have anemia due to the increased risk of renal disease [25], especially chronic kidney disease. It is likely that interactions between the environment/lifestyle and genetic factors provide the explanation for the high risk of developing type 2 diabetes in this population . However, demonstrating such interactions is highly challenging. In addition, the increasing number of older persons and low death rates increase the proportion of people living with diabetes, rendering a large number of people at risk of acquiring this sequel [26]. Moreover, 20% of diabetics may develop nephropathy, according to the American Diabetes Association [27].

Rationale

The resilient predictors of developing anemia were advancing age and diabetes, based on Studies. Anemia is significantly associated with walking and vision disabilities among older persons with diabetes and with self-care difficulties in those without diabetes. There is a need for future studies to evaluate strategies to prevent anemia among older adults in order to

promote healthy aging, dietary deficiency plays a major role in causation of anemia. dietary intake is influenced by cultural factors as well as perceived benefits of a particular diet. Studies on elderly patients and adolescent reported that though they were aware that poor quality or lack of diet causes anemia, their knowledge regarding specific dietary elements in preventing anemia was limited.

Aim of the study: To Assessment Knowledge about Anemia among elderly patients attending at Primary Health Care at Saudi Arabia 2022

Materials and Methods

Study Design.

This cross-sectional study was conducted at PHCCs, chosen through simple random sampling using random number generator.

Study setting:

At the beginning of the selection, the researcher selected 4 PHCCs among 85 PHCCs inside at Saudi Arabia (source; Ministry of Health) to be subjected to randomization. These PHCCs have available facilities and capable to conduct the hemoglobin at limited time in August to September 2022. PHCCs, which include several clinics such as chronic disease general, geriatric, antenatal, dressing, dietitian, dental, vaccination, are one of the modalities health care centers at the ministry of health (MOH) that provide PHC clinic services.

Study Population.

Elderly patients attending at Primary Health Care Clinic who are visiting PHCCs for routine follow-up in the PHC clinic were selected through convenience sampling technique, elderly patients women attending, elderly patients attending at Primary Health ranges from 300 participant.

Sample Size

The sample size was estimated to be (300) using Raosoft calculator, following the criteria of 95% confidence level and 5% margin error, and with the assumption from the literature that the prevalence of anemia among elderly patients covering about 300 participant.

Sampling Techniques

Makkah City health care center selection, there are three health care sectors inside at Saudi Arabia. By using simple random sample technique (by using randomizer.org), health care sector was selected. Again, by using simple random sample technique primary health care center was selected (by using randomizer.org website), at the ministry of health (MOH) that provide PHC services. PHC clinic works all week with a target population almost of 300 elderly patient's participant. To collect data from sample size, the researcher needs nearly 10 patients per day to collect desired sample size. The researcher has been selecting every 3 the patient to cover the sample size during data collection period.

Inclusion Criteria

- Elderly patient who agree to participate in the study
- Residency Saudi Arabia .
- Over 60 years of age
- Able and willing to participate in the study.
- Diagnosed with Anaemia illnesses

Exclusion Criteria .

- Elderly patient Residency outside Saudi Arabia .
- Population that refusing sign Informed consent.

Data Collection Tools and Techniques .

The study involved the use of questionnaire filled by the researcher through an interview with the elderly patient's participant attending Clinic. After the preparation by the researcher and modification by the supervisor, the questionnaire was tested for validity and reliability and was accepted as the result matched more than 80%. Furthermore, the result of hemoglobin was attached in the form weekly. The questionnaire was designed in English version and was translated to Arabic language, specifically the following sections: demographic data, determinants of anemia, social part, dietitian and level of elderly hemoglobin . For the collection part, the researcher gave the official acceptance paper from health affairs to the manager of each PHC. The researcher filled out the questionnaire in the course of interview with the elderly patients attending Clinic.

Data Entry and Analysis .

Data were collected by hand then coded before entry. Afterwards, the data were entered using the statistical product and service solutions (SPSS version 24). Analysis was carried using descriptive and adult patient. The researcher classified the result of the hematological parameters of elderly anemic.

Pilot Study/Pretesting.

A pilot study was conducted at PHCC considering 10% of the sample size. The 10% of the total sample 300 was chosen and were not included in the main study. This was done to test the wording of the questionnaire and feasibility of the methodology.

Ethical Consideration .

Permission from the Makkah joint program of family medicine and Directorate of Health Affairs of the Holy Capital Primary Health Care were obtained. All information were kept confidential and results will be submitted to the department as feedback.

Budget : Self-funded.

Results

Table 1. Distribution of the Socio-demographic characteristics of respondents

	N	%
Age		
<65	141	47
65-75	99	33
>75	60	20
Gender		
Female	147	49
Male	153	51
Marital status		
Married	90	30
Single	174	58
Divorced	36	12
Level of education		
None	81	27
Primary	87	29
Secondary	75	25
University	57	19
Nationality		
Saudi	135	45
Non-Saudi	165	55
Economic level		
<10,000	201	67
10,000 to 20,000	84	28
>20,000	15	5

Table 1 shows that most of the participants (47.0%) were in the age group < 65 years followed by the (33.0%) were the age group 65-75 years while >75 years, regarding the gender the majority of participants male were (51.0%) while female were (49.0%), regarding the Marital status the majority of participants single were (58.0%) while married were (30.0%) but the diversity were (12.0%), regarding educational level the majority of participants are primary education were (29.0%) while none were (27.0%) while secondary were (25.0%), regarding Nationality the majority of participants are Non-Saudi were (55.0%) while Saudi were (45.0%), regarding the Economic level the majority of participants <10,000 were (67.0%) while 10,000 to 20,000 were (28.0%) while >20,000 were (5.0%)

Table 2. Distribution of the knowledge about Anaemia among elderly patients attending Primary Health Care

	Correct		FALSE		Chi-square	
	N	%	N	%	X ²	P-value
Do you know what is anemia?	195	65	105	35	27.000	<0.001*
Do you know what hemoglobin is?	165	55	135	45	3.000	0.083
Do you know which of the blood cell when decreased causes anemia?	228	76	72	24	81.120	<0.001*
Do you know which mineral deficiency in the body causes anemia?	174	58	126	42	7.680	0.006*
Do you know in anemic female, the hemoglobin is?	144	48	156	52	0.480	0.488
Do you know what laboratory test is to diagnose anemia?	165	55	135	45	3.000	0.083
Do you know Heavy blood loss due to menstruation can cause anemia	207	69	93	31	43.320	<0.001*
Can anemia be prevented?	135	45	165	55	3.000	0.083
Does anemic patient become breathless easily?	111	37	189	63	20.280	<0.001*
Is anemic patient more prone to repeated infections?	147	49	153	51	0.120	0.729
Will anemic patient suffer from lack of concentration?	195	65	105	35	27.000	<0.001*
Does anemic patient have pale eyes, pale tongue and pale nails?	99	33	201	67	34.680	<0.001*
Can regular exercise prevent anemia?	117	39	183	61	14.520	<0.001*
Can anemia be treated by iron tablets?	144	48	156	52	0.480	0.488
What are the sources of Iron	201	67	99	33	34.680	<0.001*
Avoiding consumption of tea, coffee after food can improve absorption of iron. Is this true	165	55	135	45	3.000	0.083
Inclusion of Vitamin C helps in iron absorption?	240	80	60	20	108.000	<0.001*
Is severe anemia life threatening?	207	69	93	31	43.320	<0.001*
If severe anaemia not treated on time, needs blood transfusion?	198	66	102	34	30.720	<0.001*
Do you have any knowledge about Anaemia prophylaxis programmed?	201	67	99	33	34.680	<0.001*

Table (2) show In anemia related knowledge assessment, regarding you know what is anemia the majority of participant answer Correct were(65.0%) while answer false were (35.0%),while a significant relation were P-value=0.001, X² 27.000, regarding the you know what haemoglobin is the majority of participant answer correct were(55.0%) while answer false were (45.0%), while no significant relation were P-value=0.083, X² 3.000, regarding the do you know which of the blood cell when decreased causes anemia the majority of participant answer correct were(76.0%) while answer false were (24.0%), while a significant relation were P-value=0.001, X² 81.120, regarding you know which mineral deficiency in the body causes anaemia the majority of participant answer correct were(58.0%) while answer false were

(42.0%), while a significant relation were $P\text{-value}=0.006$, X^2 7.680, regarding you know in anemic female, the hemoglobin is the majority of participant answer false were (52.0%) while answer correct were (48.0%), while no significant relation were $P\text{-value}=0.488$, X^2 4.680, regarding you know what laboratory test is to diagnose anaemia the majority of participant answer correct were (55.0%) while answer false were (45.0%), while no significant relation were $P\text{-value}=0.083$, X^2 3.000, regarding you know Heavy blood loss due to menstruation can cause anemia the majority of participant answer correct were (69.0%) while answer false were (31.0%), while a significant relation were $P\text{-value}=0.001$, X^2 43.320, regarding Can Anemia be prevented the majority of participant answer false were (55.0%) while answer correct were (45.0%), while no significant relation were $P\text{-value}=0.083$, X^2 3.000, regarding does anemic patient become breathless easily the majority of participant answer false were (65.0%) while answer correct were (37.0%), while a significant relation were $P\text{-value}=0.001$, X^2 20.280, regarding the is anemic patient more prone to repeated infections the majority of participant answer false were (51.0%) while answer correct were (49.0%), while no significant relation were $P\text{-value}=0.729$, X^2 0.120, regarding anemic patient suffer from lack of concentration the majority of participant answer correct were (65.0%) while answer false were (35.0%), while a significant relation were $P\text{-value}=0.001$, X^2 27.000, regarding anemic patient have pale eyes, pale tongue and pale nails the majority of participant answer false were (67.0%) while answer correct were (33.0%), while a significant relation were $P\text{-value}=0.001$, X^2 34.680, regarding you know what laboratory test is to diagnose anemia the majority of participant answer correct were (55.0%) while answer false were (45.0%), while no significant relation were $P\text{-value}=0.083$, X^2 3.000, regarding you Can regular exercise prevent anemia the majority of participant answer false were (61.0%) while answer correct were (39.0%), while a significant relation were $P\text{-value}=0.001$, X^2 14.520, regarding Can anemia be treated by iron tablets the majority of participant answer false were (52.0%) while answer correct were (48.0%), while no significant relation were $P\text{-value}=0.488$, X^2 0.480, regarding the sources of Iron the majority of participant answer correct were (67.0%) while answer false were (33.0%), while a significant relation were $P\text{-value}=0.001$, X^2 34.680, regarding avoiding consumption of tea, coffee after food can improve absorption of iron. is this true the majority of participant answer correct were (55.0%) while answer false were (45.0%), while no significant relation were $P\text{-value}=0.083$, X^2 3.000, regarding inclusion of Vitamin C helps in iron absorption the majority of participant answer correct were (80.0%) while answer false were (20.0%) while a significant relation were $P\text{-value}=0.001$, X^2 108.000, regarding is severe anemia life threatening the majority of participant answer correct were (69.0%) while answer false were (31.0%), while a significant relation were $P\text{-value}=0.001$, X^2 43.320, regarding if severe anemia not treated on time, needs blood transfusion the majority of participant answer correct were (66.0%) while answer false were (34.0%), while a significant relation were $P\text{-value}=0.001$, X^2 30.720, regarding you have any knowledge about anemia prophylaxis Programmer the majority of participant answer correct were (67.0%) while answer false were (33.0%), while a significant relation were $P\text{-value}=0.001$, X^2 34.680

Table 3 Distribution general knowledge about anaemia among elderly patient attending Primary Health Care

	Knowledge	Chi-square
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	N	%	X ²	P-value
Weak	78	26	10.14	0.006*
Average	123	41		
High	99	33		
Total	300	100		
Range	1-20.			
Mean+SD	12.603±4.288			

Table 3 Regarding distribution of the general knowledge the most of participant with average were (41.0%) followed by high were (33.0%) but weak were (26.0%) while a significant relation while P-value= 0.006 and X² 10.14 while Range(1-20) and Mean± SD (12.603±4.288).

Figure 1: Distribution general knowledge about anaemia among elderly patient attending Primary Health Care

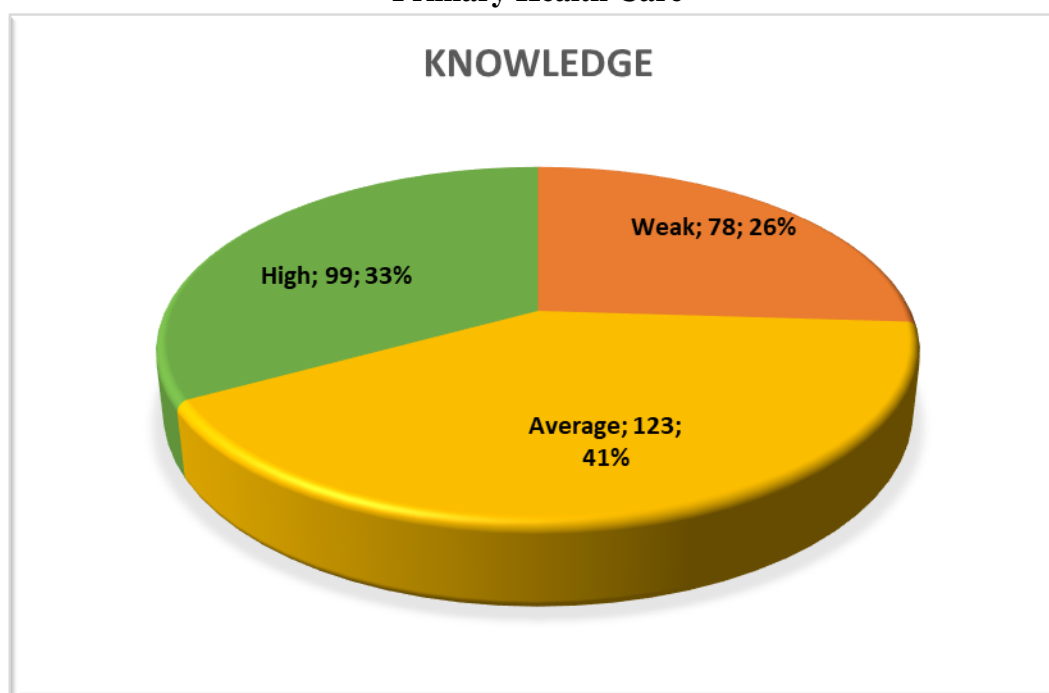


Table 4 Distribution of the relationship of the Socio-demographic characteristics and knowledge about anaemia among elderly patient attending Primary Health Care

Socio-demographic		N	Knowledge			Test	ANOVA or T-test	
			Mean	±	SD		F or T	P-value
Age	<65	141	15.035	±	1.925	ANOVA	234.547	<0.001*

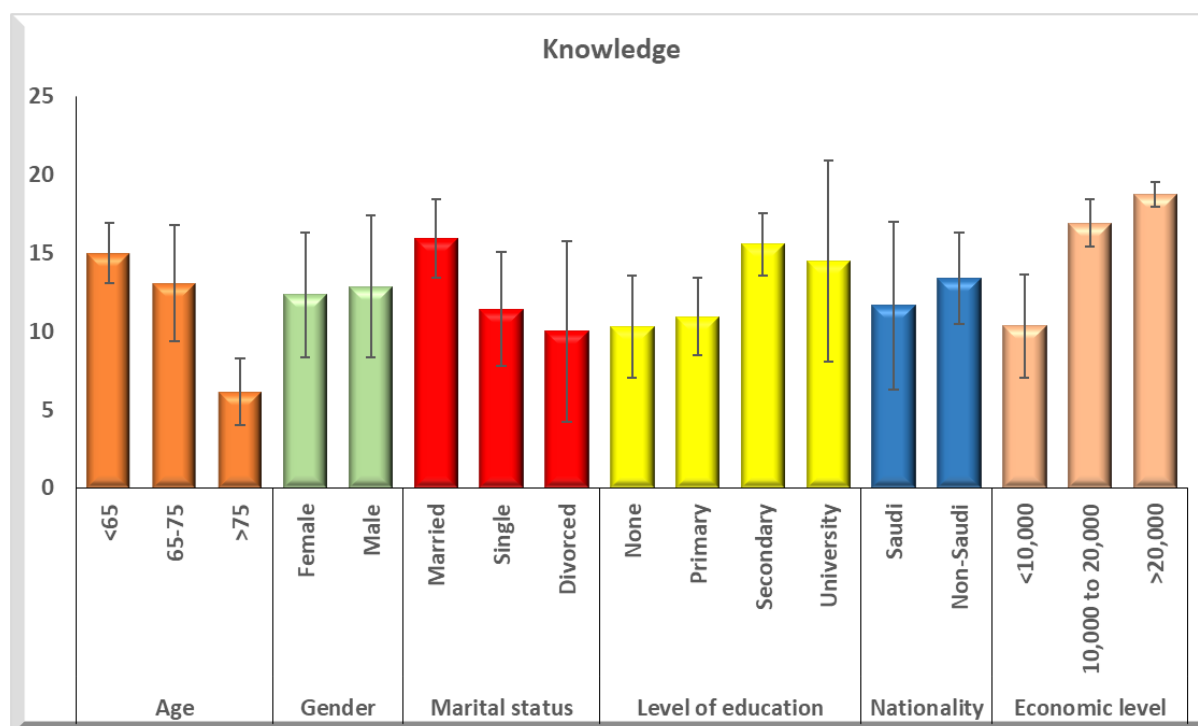
	65-75	99	13.061 ± 3.706			
	>75	60	6.133 ± 2.127			
Gender	Female	147	12.333 ± 4.002	T-test	-1.069	0.286
	Male	153	12.863 ± 4.544			
Marital status	Married	90	15.933 ± 2.534	ANOVA	54.997	<0.001*
	Single	174	11.420 ± 3.624			
	Divorced	36	10.000 ± 5.777			
Level of education	None	81	10.296 ± 3.250	ANOVA	38.453	<0.001*
	Primary	87	10.943 ± 2.475			
	Secondary	75	15.587 ± 1.987			
	University	57	14.491 ± 6.398			
Nationality	Saudi	135	11.652 ± 5.380	T-test	-3.543	<0.001*
	Non-Saudi	165	13.382 ± 2.919			
Economic level	<10,000	201	10.343 ± 3.272	ANOVA	199.705	<0.001*
	10,000 to 20,000	84	16.917 ± 1.530			
	>20,000	15	18.733 ± 0.799			

T: T-test

F: ANOVA test

Table (4) show that is a significant relation between knowledge about Anemia with demographic data regarding age the knowledge about Anemia have a significant relation with age were P-value=0.001, ANOVA (F) test 234.547 increase in < 65 years followed by 65-75 years were respectively (Mean± SD 15.035 ± 1.925 and 13.061 ± 3.706), regarding the gender is no significant relation between the knowledge about Anemia no significant relation were P-value=0.286, T test -1.069 increase in male follower by female were respectively (Mean± SD 12.863±4.544 and 12.333±4.002), regarding the marital status is a significant relation between knowledge about Anemia have a significant relation were P-value=0.001, ANOVA (F) test 54.997 increase in married followed by single were respectively (Mean± SD 15.933 ± 2.534 and 11.420±3.624). regarding the educational level a significant relation between knowledge about Anemia have were P-value=0.001, ANOVA (F) test 38.453 increase in Secondary followed by University were respectively (Mean± SD 15.587 ± 1.987 and 14.491 ± 6.398), regarding the nationality a significant relation between knowledge about Anemia and nationality were P-value=0.001, T test =-3.543 increase in Non-Saudi followed Saudi by were respectively (Mean± SD 13.382±2.919 and 11.652 ± 5.380), regarding the economic level is a significant relation between knowledge about Anemia and economic level were P-value=0.001, ANOVA (F) test increase in >20,000 followed by 10,000 to 20,000 were respectively (Mean± SD 18.733 ± 0.799 and 16.917 ± 1.530).

Figure 2 Distribution of the relationship of the Socio-demographic characteristics and knowledge about anaemia among elderly patient attending Primary Health Care



Discussion

The Assessment Knowledge about Anemia among elderly patients attending at Primary Health Care, in Saudi Arabia 2022. in our study shows that most of the participants (47.0%) were in the age group < 65 years follow by the (33.0%) were the age group 65-75 years while >75years , regarding the gender the majority of participant male were (51.0%) while female were(49.0%), regarding the Marital status the majority of participant Single were (58.0%) while married were(30.0%) but the diversity were (12.0%), regarding educational level the majority of participant are primary education were(29.0%) while none were (27.0%) while secondary were(25.0%) regarding Nationality the majority of participant are Non-Saudi were(55.0%) while Saudi were(45.0%), regarding the Economic level the majority of participant <10.000 were (67.0%) while 10.000 to 20.000 were(28.0%) while >20,000 were (5.0%) (See table 1)

Previous studies in younger subjects have consistently shown the usefulness of serum ferritin in the diagnosis of iron-deficiency anemia, and suggested that serum ferritin is more powerful than other blood tests, in elderly patients with anemia, serum ferritin determination is by far the best test for diagnosis of iron deficiency. Other tests add only limited information in the diagnosis.[28] Despite, anemia in among elderly patients attending at Primary Health Care at the national level in Saudi Arabia is classified by WHO as severe public health problem [21], yet, the estimated in our study Knowledge about general anemia signs and symptoms indicates that the problem in urban Makkah is of moderate public health importance based on the same WHO classification [29]. This Knowledge anemia is also weak than the global Knowledge and symptoms and of Eastern Mediterranean countries [30]. Regarding the distribution of the knowledge about Anemia among elderly patients attending Primary Health Care a similar study showed demonstrated that the prevalence of anemia among older persons aged 60 years and above was 35.3%. This finding was attributed to the higher prevalence of co-morbidities, such

as hypertension, diabetes and chronic kidney disease, in the older population [23]. Additionally, anemia in older persons in Malaysia was associated with Indian and Malay ethnicities, increasing age, hospitalization and diabetes in a prior study by Ioannou, et al. [24]. Compared to the Knowledge reported in other regions in Saudi Arabia, the estimate for Hail is slightly higher than the Knowledge reported in Asir region (31.9%) [32], but lower than the Knowledge reported in Makkah (39.0%). Al-Khobar (41.3%) [31] and much lower than the prevalence reported from Al-Ahsa (73.3%) [26], the present study showed that the Knowledge was weak according to WHO classification of the public health importance of anaemia, it is a severe public health problem [29]. This finding is slightly higher than the 'Kenya national Knowledge about general anemia in the elderly patients'. It is also much higher than to the study carried out in Kakamega County (Kenya) reported at 40% [31]. This variation can be due to the fact that the participants of this study did not include adult as anaemia is more common. However, the figure is relatively comparable to other studies conducted in African countries such as Nigeria at 54.5% and Ethiopia at 56.8% [33]. But it is lower than the findings from Uganda at 63.1% and Egypt at 62.2% and higher than Tanzanian finding at 47.4% [34]. (See table 2).

Regarding distribution of the general knowledge the most of participant with average were (41.0%) followed by high were (33.0%) but weak were (26.0%) while a significant relation while $P\text{-value} = 0.006$ and $X^2 = 10.14$ while Range(1-20) and $\text{Mean} \pm \text{SD} (12.603 \pm 4.288)$. (See table 3),

Regarding relationship of the Socio-demographic characteristics and knowledge about anaemia among elderly patient attending Primary Health Care, that is a significant relation between knowledge about Anemia with demographic data regarding age the knowledge about Anemia have a significant relation with age were $P\text{-value} = 0.001$, ANOVA (F) test 234.547 increase in < 65 years followed by 65-75 years were respectively ($\text{Mean} \pm \text{SD} 15.035 \pm 1.925$ and 13.061 ± 3.706), regarding the gender is no significant relation between the knowledge about Anemia no significant relation were $P\text{-value} = 0.286$, T test -1.069 increase in male followed by female were respectively ($\text{Mean} \pm \text{SD} 12.863 \pm 4.544$ and 12.333 ± 4.002), regarding the marital status is a significant relation between knowledge about Anemia have a significant relation were $P\text{-value} = 0.001$, ANOVA (F) test 54.997 increase in married followed by single were respectively ($\text{Mean} \pm \text{SD} 15.933 \pm 2.534$ and 11.420 ± 3.624). regarding the educational level a significant relation between knowledge about Anemia have were $P\text{-value} = 0.001$, ANOVA (F) test 38.453 increase in Secondary followed by University were respectively ($\text{Mean} \pm \text{SD} 15.587 \pm 1.987$ and 14.491 ± 6.398), regarding the nationality a significant relation between knowledge about Anemia and nationality were $P\text{-value} = 0.001$, T test = -3.543 increase in Non-Saudi followed Saudi by were respectively ($\text{Mean} \pm \text{SD} 13.382 \pm 2.919$ and 11.652 ± 5.380), regarding the economic level is a significant relation between knowledge about Anemia and economic level were $P\text{-value} = 0.001$, ANOVA (F) test increase in >20,000 followed by 10,000 to 20,000 were respectively ($\text{Mean} \pm \text{SD} 18.733 \pm 0.799$ and 16.917 ± 1.530). (See table 4). Similar a comparatively higher prevalence in relation to the current study was reported earlier from a study done in Eastern Region of Saudi Arabia (41.3%) [35], and in Egypt (43%). However, quite similar prevalence (24.9%). Similar to our finding, a recent national study in Qatar showed a prevalence of 23.5% using a cut-off point of hemoglobin as <11.1 g/dL. Other

studies in Arab countries like Erbil and Iraq showed prevalence of anemia and iron deficiency anemia among infants aged 12–24 months to be 53% and 30%, respectively [36].

Conclusions

The National Health and Nutrition Examination Survey mentioned that the anemia prevalence was highest in males aged 85 years old and over in the population, that there are a few mechanisms that can explain the correlation between the prevalence of anemia with advancing age and chronic diseases. These include decreased renal hormone production, which leads to the development of anemia, and the increased expression of pro-inflammatory cytokines, which can contribute to erythropoietin insensitivity. Hence, the causes of anemia are multifactorial in nature among older persons. In terms of gender and ethnicity profiling, African, Americans and Asians are more likely to develop anemia compared to Caucasians. The prevalence of anemia was also higher in the following groups of adults: (1) the oldest adults (>85 years old); (2) those with less education; (3) those with positive screening for cognitive decline; (4) those who reported a previous diagnosis of hypertension, diabetes, cancer, cardiovascular disease, encephalic vascular accident, osteoporosis, or three or more chronic diseases; and (5) those with depressive symptoms. However, these factors were not significantly related to their nutritional state.

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