

Original Article

# Prevalence of Anemia in A Sample of Elderly Subjects from Tripoli, Libya

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## ARTICLE INFO

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## ABSTRACT

**Background and Aims:** Anaemia is a common in elderly and its incidence increases in the last few decades. While most literature has focused on children, women of childbearing age, and pregnant women, data for the elderly population are relatively rare. The purpose of this study was to determine the prevalence, severity of anaemia, and its association with demographic and clinical characteristics in a representative sample of elderly people from Tripoli-Libya. **Methods.** A total of 81 adults aged 60 years and above were enrolled in this study. A structured questionnaire was used to capture sociodemographic and clinical characteristics. Blood samples were collected, and a complete blood count were measured to assess anemia and its severity in all participants. The data was analyzed using (SPSS) software, version 20. Frequencies, proportions, and rates of the given data for each variable was calculated. The differences between the groups with and without anemia were analyzed using chi-squared test. Statistical significance was defined as a p-value < 0.05. **Results.** The overall prevalence of anaemia in the elderly population was 44%. The prevalence of anemia was higher in women than men (51% vs 36%). The prevalence of anemia was higher in windowed, divorced and married than in single individuals 79%, 37%, 25%, respectively (p value 0.014). The prevalence of anemia was higher in elderly who have medical history than who with none medical history (p-value =0.002). Elderly who has diabetes and hypertension showed a trend towards an increased prevalence of anemia (p-value = 0.032). Moderate anaemia was found in 26 (33%) anaemic participants followed by severe anaemia in 9 (11%) anaemic participants. Moderate anaemia was the most common type of anaemia among elderly. **Conclusion.** The current outcomes exhibited a relatively high prevalence of anemia in elderly. Therefore, further examination of the cause of anemia and the completion of treatment might assist to improve clinical conditions in the elderly population.

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## INTRODUCTION

The World Health Organization (WHO) criteria has been defined the elderly population as those with the chronological age of 65 years in most developed countries and 60 years for developing countries [1]. It has been noticed that the older adult population is growing up at a consistent rate [2]. From 1950 to 2050 the total population will increase to 3.7 times, whereas the number of those aged 60 and above will growth by a factor approximately of 10. Furthermore, the number of the oldest person aged 80 and above will increase by a factor of 26 [1].

This increases in older population will have adverse impact on several aspects such as, socioeconomic advancement, health of older people and healthcare provision as well [3]. particularly since additional years are not really spent in great health [4]. Therefore, it becomes very important to understand and distinguish the significance of common clinical issues in older individuals [4]. Especially if their extent and potential significance are not generally recognized. Anemia might be one such problem [4].

Anemia is a multifactorial condition, and it is a common public health problem in older adults, especially in developing countries where the prevalence of anemia is higher than developed countries [1]. It has been defined by the World Health Organization (WHO) as a hemoglobin (Hb) level <13 g/dL in men and > 12 g/dL in women [5]. This condition can be happened due to various pathophysiological mechanisms [6]. Hemoglobin concentration also classifies the anaemia severity into mild, moderate, and severe [7].

Anemia is a common concern in the geriatric age group (> 60 years of age), and can cause significantly more severe complications than anemia in younger adults [8]. In addition, anemia in older adults is usually considered as an inevitable consequence of aging and often underdiagnosed and the patient is not informed about it [1]. Therefore, it is associated with high risks of mortality and morbidity and a drop in the quality of life [6].

In the elderly population the most common causes of anemia can be classified as, anemia due to chronic inflammatory disease such as chronic kidney disease and chronic infectious disease, collagen disease and malignancies. One more cause of anemia is nutritional deficiency such as, iron deficiencies, folate and B12 [1].

Although anaemia has been extensively studied in children, women of reproductive age, and pregnant women in Libya [9,10], to the best of our knowledge, there are no many studies that have been done on anaemia in the elderly population in Tripoli, Libya. Therefore, the objective of this study was to analyze the prevalence of anemia and its association with demographic characteristics in a sample of elderly people from Tripoli, Libya.

## METHODS

### ***Study design and setting***

A descriptive cross- sectional study was conducted at Tripoli Central Hospital between the period of April to July 2021, and was approved by the Department of Medical Laboratories Sciences at the University of Tripoli. All participants provided consent before participating in the study. Participants were enrolled if they were 60 years or older, voluntary agreed and signed consent form to participate in the study. Participants were excluded from the study if; 1) they had received a blood transfusion prior seven days, (2) they were on treatment for nutritional causes of anaemia such as oral iron, folate, or vitamin B12, or (3) they were not able to communicate. A structured questionnaire was filled for each participant, recording sociodemographic characteristics and past medical history

### ***Sample Collection and Laboratory Methods***

Three milliliters of venous blood were drawn in ethylenediaminetetraacetic acid (EDTA) tubes and were immediately sent to the laboratory for hematological testing. Full blood counts were run on a Sysmex XT-2000i automated blood analyzer. The following data were taken into analysis: red blood cell (RBC) count, Hb concentration, hematocrit, or packed cell volume (PCV), as well as Mean cell hemoglobin MCH (fl) and mean cell hemoglobin concentration MCHC (pg).

The World Health Organization (WHO) criteria were used to define anemia (hemoglobin levels of less than 13.0 g/dl in men and less than 12.0 g/dl in women). Severity of anaemia was considered based on the WHO classification; mild anaemia was denoted by hemoglobin levels of 11 g/dl–11.9 g/dl in women and hemoglobin

11–12.9 g/dl in men. Moderate anaemia is denoted if hemoglobin levels were between 8 and 10.9 g/dl in both men and women and severe anaemia if hemoglobin levels were less than 8 g/dl in both men and women [3].

### ***Statistical Analysis***

The database was structured in Microsoft Office Excel 2010 and analyzed using Statistical Package for the Social Sciences (SPSS) software, version 20. Frequencies and percentage for each variable was calculated. The differences between the groups with and without anemia were analyzed using chi-squared test. Statistical significance was defined as a p-value < 0.05.

## **RESULTS**

### ***Study Participants***

The current study enrolled about 80 participants, of whom 39 (48.7%) were men, and 41 (51.25%) were women. Nearly a half of the contributors were educated and more than a half were married. Approximately a half of Participants were retired ,64% with an average income,42 % of participant didn't have any medical history, whereas, 18% with diabetes and 16% with hypertension (Table1).

### ***Prevalence of Anaemia***

The overall prevalence of anaemia in this elderly population was 44%. The prevalence of anemia was higher in women than men (51% vs 36%), but the difference was not statistically significant (p-value 0.167) (Table 1). As for material status, there was significant difference in proportion of the prevalence of anemia and material status, the prevalence of anemia was higher in windowed, divorced and married than in single individuals 79%,37%, 25%, respectively (p value 0.014). In addition, the prevalence of anemia was higher in elderly who have medical history than who with none medical history (p-value =0.002), the elderly who have diabetes and hypertension showed a trend towards an increased prevalence of anemia (p-value = 0.032).

As it shown in Table 1, No significant differences observed for the other variables analyzed in this study (Education, Retired, employment and Income level).

**Table 1. Demographic and clinical characteristics of non-anemic and anemic individuals**

Variables	Entire population n (%)	Participant without anemia, Hb 12-15 n (%)		Participant with anemia, Hb <12g/dl in women & <13 g/dl in men n (%)		p-value
No. of entire population	80	45	56%	35	44%	
Gender						
men	39	25	64%	14	36%	0.167
Women	41	20	49%	21	51%	
Education						
Yes	47	27	57%	20	43%	0.797
No	33	18	55%	15	45%	
Marital status						
Single	4	3	75%	1	25%	0.014
Married	62	39	63%	23	37%	
Others (widowed, divorced, etc.)	14	3	21%	11	79%	
Retired						
Yes	29	15	52%	14	48%	0.538
no	51	30	59%	21	41%	
Employment						
yes	50	28	56%	22	44%	0.954
no	30	17	57%	13	43%	
Income level						
Low	9	4	44%	5	56%	0.529
Average	64	38	59%	26	41%	
High	7	3	43%	4	57%	
Any medical history						
no	42	30	71%	12	29%	0.032
No. of diabetes (DM) patients	18	8	44%	10	56%	
No. of hypertension (HTN)	16	6	37.5%	10	62.5%	
No. of both (DM-HTN)	4	1	25%	3	75%	

### **Severity of Anaemia.**

Moderate anaemia was found in 26 (33%) anaemic participants. It was followed by severe anaemia in 9 (11%) anaemic participants. Moderate anaemia was the most common type of anaemia among elderly. Women had moderate and severe anemia more than men 39% ,12% respectively (Table 2). There was significant difference between the severity of anemia and the material status, the prevalence of moderate anemia was higher in widowed and divorced (64.3%) than single and married (25%,26%) respectively (p value=0.048). Significant difference was also noted between the severity of anemia and medical history, the elderly who have diabetes and hypertension are more likely to have moderate anemia than others (Table 2).

**Table 2. Prevalence of Moderate and Severe anemia in the elderly (≥ 60 years) according to demographic and socioeconomic data.**

Variables	Participant without anemia, Hb 12-15 n (%)		Moderate anemia, Hb: 9–11 g/dL, n (%)		Severe anemia, Hb: < 8 g/dL, n (%)		p-value
	n	%	n	%	n	%	
<b>No. of entire population</b>	45	56%	26	33%	9	11%	
<b>Gender</b>							
<b>men</b>	25	64%	10	26%	4	10%	0.367
<b>Women</b>	20	49%	16	39%	5	12%	
<b>Education</b>							
<b>Yes</b>	27	57%	14	30%	6	13%	0.771
<b>No</b>	18	55%	12	36%	3	9%	
<b>Marital status</b>							
<b>Single</b>	3	75%	1	25%	0	0%	0.048
<b>Married</b>	39	63%	16	26%	7	11%	
<b>Others (widowed, divorced, etc.)</b>	3	21.4%	9	64.3%	2	14.3%	
<b>Retired</b>							
<b>Yes</b>	15	52%	10	34%	4	14%	0.786
<b>no</b>	30	59%	16	31%	5	10%	
<b>employment</b>							
<b>yes</b>	28	56%	17	34%	5	10%	0.87
<b>no</b>	17	57%	9	30%	4	13%	
<b>Income level</b>							
<b>Low</b>	4	44.5%	4	44.5%	1	11%	0.844
<b>Average</b>	38	59%	19	30%	7	11%	
<b>High</b>	3	43%	3	43%	1	14%	
<b>Any medical history</b>							
<b>no</b>	30	71.4%	11	26.2%	1	2.4%	0.021
<b>No. of diabetes (DM) patients</b>	8	44.5%	8	44.5%	2	11%	
<b>No. of hypertension (HTN)</b>	6	38%	5	31%	5	31%	
<b>No. of both (DM-HTN)</b>	1	25%	2	50%	1	25%	

## DISCUSSION

Anemia is a common condition among older adults is associated with increased mortality, drop of quality of life, and Impaired physical performance [8]. The current study was conducted to estimate the prevalence of anemia and its association with demographic and clinical characteristics in a sample of elderly people from Tripoli, Libya. The prevalence of anemia in this study population was found to be 44% which is much higher than a prospective study conducted in elderly Koreans and a prospective population –based study conducted in Biella (Italy) where the prevalence rate was 13.6%, 11.8% respectively [13]. Our finding was also higher than the prevalence rate in Mexican and Brazilian elderlies (7.7%, 12.8%) respectively [17]. On the other hand, the prevalence of anemia in our study was lower than prevalence rate in kashmir 77.5% [18]. The possible reason for inconsistencies might be differences in the study population, area and the differences in cutoff points for the selection of older age in developed and developing countries [12].

Our finding demonstrated a higher prevalence of anemia in women than in men (51% vs 36%). These results are similar to the study conducted among free living elderly in South Brazil, where the prevalence of anemia was 10.4% for men and 13.7% for women [6].

It also agrees with the findings of Obaidely et al who found that anemia is more prevalent in elderly women than in elderly men (40.6% vs 28.7%) [16]. Our results also consistent with the findings from other study that evaluated 284 elderly participants in the Family Health Program of Pernambuco, Brazil. The study found that the average prevalence of anemia in women was 12.6% versus 10.9% in men [19].

In contrast, a study performed by Olivares et al. enrolled 274 elderly outpatients in Chile and found a low prevalence of overall anemia, but a higher prevalence among men (5.4%) compared to women (4.4%) [11].

Our result also in accordance with the study conducted by Afaghi H et al, who reported that the prevalence of anemia was more common in older men (12.54%, n=85) than older women (9.75%, n=70) [1].

The different prevalence rates of anemia for men and women can be explained as a result of the estrogens which is act as inhibitors of erythropoiesis and make women more vulnerable to the development of anemia [6]. It might be also due to poor nutrition, less importance given to their own health due to lack of empowerment [14]. In this study, those with diabetes and hypertension had a higher prevalence rate of anemia than the other groups without these illnesses. The prevalence of anemia in diabetic patient was found to be 56% which is consistent with the prevalence reported by Sharif et al (2014) which was 63% [15].

In our study, the prevalence of anemia is significantly higher in elderly with hypertention 62.5%. These findings are in agreement with a study published by Paul et al (2008) which reported higher prevalence of normocytic anaemia in patients with uncontrolled hypertension (20%) than among those with well-controlled hypertension [16].

Furthermore, in the present study, Moderate anaemia was the most common type of anaemia among participants, and this finding was similar to the study performed by Chamba et al, where the Moderate anaemia was found in 53 (42.7%) anaemic participants [7]. Severe anemia in our study was only found in 11% of anaemic participants, which is lower than the study done in Tanzania: which was 33.9 % [7].

Our study has some limitations. First, the study is included a relatively small sample size and the participant were only from one city. Second, the study was a cross-sectional design, therefore, it was not possible to determine the direct association and consequently the causations. It was also not possible to measure the causes of anemia, including, folate, ferritin and vitamin B12.

## CONCLUSION

This descriptive, cross-sectional study found a relatively high prevalence of anemia in elderly. Our finding showed the relation of anemia with some risk factors such as Age gender and with some common illness like Diabetic and Hypertension. Therefore, further examination of the cause of anemia and the completion of treatment might assist to improve clinical conditions in the elderly population.

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### **Declaration of competing interest**

None.

## REFERENCES

1. Afaghi H, Sharifi F, Moodi M, AnaniSarab G, Kazemi T, Miri-moghaddam E, Tahergorabi Z. Prevalence of anemia and associated factors among the elderly population in South Khorasan, Birjand, 2019. *Medical Journal of The Islamic Republic of Iran (MJIRI)*. 2021 Jan 10;35(1):674-
2. Bayuo J, Botchway AE. Burns among older persons: A narrative review. *Burns Open*. 2017 Jul 1;1(1):2-8.
3. Noroozian M. The elderly population in iran: an ever-growing concern in the health system. *Iranian journal of psychiatry and behavioral sciences*. 2012;6(2):1.
4. Gaskell H, Derry S, Moore RA, McQuay HJ. Prevalence of anaemia in older persons: systematic review. *BMC geriatrics*. 2008 Dec;8(1):1-8.
5. Eisenstaedt R, Penninx BW, Woodman RC. Anemia in the elderly: current understanding and emerging concepts. *Blood reviews*. 2006 Jul 1;20(4):213-26.
6. Sgnaolin V, Engroff P, Ely LS, Schneider RH, Schwanke CH, Gomes I, Morrone FB, Carli GA. Hematological parameters and prevalence of anemia among free-living elderly in south Brazil. *Revista brasileira de hematologia e hemoterapia*. 2013; 35:115-8.
7. Chamba C, Nasser A, Mawalla WF, Masamu U, Budodi Lubuva N, Tebuka E, Magesa P. Anaemia in the Hospitalized Elderly in Tanzania: Prevalence, Severity, and Micronutrient Deficiency Status. *Anemia*. 2021 Feb 26;2021.
8. Alsaeed AH. An analysis of hematological parameters to assess the prevalence of anemia in elderly subjects from Saudi Arabia. *Genetic testing and molecular biomarkers*. 2011 Oct 1;15(10):697-700.
9. bireal JM, Azab AE. Prevalence of Iron Deficiency Anemia among School Children in Sabratha, Western Libya. *Archives of Hematology and Blood Diseases V3*. I1. 2020:26.
10. Mazughi IF, Arebi AM, Sherif FM. Prevalence of Anemia among Libyan Pregnant Women and its Relation to Low Birth Weight. *Prevalence*. 2018 Dec;2(12):1-6.
11. Olivares M, Hertramp E, Capurro MT, Wegner D. Prevalence of anemia in elderly subjects living at home: role of micronutrient deficiency and inflammation. *Eur J Clin Nutr*. 2000;54(11):834-9
12. Barbosa DL, Arruda IK, Diniz AS. Prevalência e caracterização da anemia em idosos do Programa de Saúde da Família. *Rev Bras Hematol Hemoter*. 2006;28(4):288-92.
13. Choi CW, Lee J, Park KH, Yoon SY, Choi IK, Oh SC, Seo JH, Kim BS, Shin SW, Kim YH, Kim JS. Prevalence and characteristics of anemia in the elderly: Cross-sectional study of three urban Korean population samples. *American journal of hematology*. 2004 Sep;77(1):26-30.
14. AIDallal SM, Jena N. Prevalence of anemia in type 2 diabetic patients. *Journal of hematology*. 2018 May;7(2):57.
15. Sharif A, Younus S, Baig K, Ali NH. Prevalence and risk of anemia in type-2 diabetic patients. *Health*. 2014 Jun 9;2014.
16. Paul B, Wilfred NC, Woodman R, DePasquale C. Prevalence and correlates of anaemia in essential hypertension. *Clinical and experimental Pharmacology and Physiology*. 2008 Dec;35(12):1461-4.
17. Corona LP, D uarte YL, Lebrao ML. Prevalence of anemia and associated factor in older adults: evidence from the SABE Study. *Rev Saude Revista*. 2014;48(5):723-431.

18. Hilal N, Mushtaq A. Prevalence of anemia in geriatric population of Kashmir: A hospital based study. *Ann Med Physiol.* 2017.
19. Callera F, Callera AF, Silva AM, Rosa ES. Prevalence of anemia in a sample of elderly southeastern Brazilians. *Revista brasileira de hematologia e hemoterapia.* 2015 Jan; 37:43-7.