Early detection of the risk for orthostatic hypotension among the elderly people

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Abstract:

Background/Aim: Orthostatic hypotension is an important problem that commonly occurs in elderly people. It causes a burden on public health, is associated with impaired motor performance, and negatively affects physical functioning and activities. This study **aimed** to detect the risk of orthostatic hypotension in elderly people.

Materials and methods: A descriptive research design was used. The study was conducted at the Badr geriatric home and outpatient clinic of Fayoum university hospital, Egypt. **Subjects:** A total of 300 elderly individuals. **Tools:** Structured interview questionnaire, Orthostatic Hypotension Symptom Assessment Questionnaire, and supine to stand test.

Results: About three-fifths of the sample were aged 60-69 years old and more than one third of the participants (34.0%) were aged 70-79 years old. In addition, 53.3% of the clients were male and 46.7% were female. Regarding to the residence, more than three quarters of the participants (79.3%) were from rural areas and 40.0% of them were illiterate, not working (86.7%), and married (62.0%). In addition, 24.0% of the elderly clients suffered from orthostatic hypotension (OH) which affected activities that required walking or standing for a long time. In addition, a longer time was required for a shower (86.1%), prolonged bed rest (55.6%), carbohydrate-heavy meals (54.2%), obesity (52.7%), hypertension (43.1%), diabetes mellitus (36.1%), cardiac diseases (27.8%), and anemia (16.7%) were the main precipitating factors for OH in elderly clients.

Conclusion: Approximately one-fifth of the clients suffered from OH. The main precipitating factors included a long time for a shower, prolonged bed rest, heavy carbohydrate meals, obesity, hypertension, diabetes mellitus, cardiac diseases, and anemia. **Recommendations:** All older adults especially those with chronic diseases should receive regular monitoring of blood pressure to detect OH and prevent complications.

Key words: Early detection, Orthostatic hypotension, Early detection, Elderly people.

Introduction:

Orthostatic hypotension (OH) is a condition in which blood pressure drops abnormally when a person stands up from a sitting or lying down position. It is a sustained reduction of systolic blood pressure of at least 20 mmHg or diastolic blood pressure of at least 10 mmHg within three minutes of standing or a head-up tilt to at

least sixty on a tilt table [1]. It is an important problem that occurs more commonly in the elderly [1, 2]. They can have both acute and chronic forms [3]. It occurs due to the failure of the mechanisms of the body for the regulation of orthostatic blood pressure [4]. This can be affected by aging. Therefore, as people increase in age the cardiovascular reflexes responsible for vasoconstriction during standing become less able to react quickly. Moreover, aging brains are more susceptible to the effects of lower blood pressure [5].

The total prevalence of OH ranges from 14.8% to 56% [1, 6]. Its prevalence is approximately 30% in patients aged > 70 years [7]. Most researchers have reported that the prevalence of OH is approximately 20% in older people, and is higher in chronic diseases, such as hypertension and diabetes, reaching above 35% in Parkinson's disease and advanced kidney failure [8]. It may increase to 37.47% of the sample in one episode [9]. It affected one in five (20%) of the community-dwelling older people and almost one in four older people (25%) in long-term care [10]. In addition, the reported prevalence of postural hypotension occurs in over half of the patients admitted to the care of elderly persons [11].

OH causes a burden on public health with a mean prevalence of 31% in the elderly and is higher in those with risk factors [1]. It may complicate the treatment of hypertension, heart failure, and cause disabling symptoms, complaints, and traumatic injuries. It also increases mortality and the incidence of stroke, atrial fibrillation [7], deterioration of quality of life [12], myocardial infarction, and death [13]. Furthermore, OH is a major risk factor for falls [14]. It is associated with impaired motor performance [15]. It is usually linked to an increased risk of cardiovascular disease, heart failure, and stroke [13]. Observational data suggest that OH in middle-aged individuals increases the risk of eventual dementia and reduces cognitive function [16].

In general, the most common factors predicting postural hypotension are dioxin use, Parkinson's disease, hypertension, cardiovascular disease an inter-arm systolic blood pressure difference [17], dehydration, bleeding, diuretics, drugs that cause vasodilatation, prolonged bed rest, significant recent weight loss [18], and hypovolemia [19]. In addition, there is evidence that the occurrence of OH is related to uncontrolled hypertension and diabetes [2,1].

Postural hypotension is often asymptomatic. In the absence of symptoms, it is only infrequently checked for in clinical practice [17], while subjective symptoms may occur such as dizziness, discomfort, nausea, fatigue, blurred vision, headache, neck pain, and palpitations [7]. Similarly, the patient may have lightheadedness, generalized weakness, difficulty concentrating, tremulousness, vertigo, anxiety, pallor, feeling sweaty [20], balance impairment [15], and sudden loss of consciousness [8]. Similarly, it may negatively affect physical functioning and activity [15].

The treatment of OH must be managed using both pharmacological and non-pharmacological approaches [21]. Non-pharmacological treatment of OH is usually sufficient for mild diseases; however, pharmacological approaches should be

considered for moderate and severe diseases [22]. Bolus water drinking should become the standard first-line non-pharmacological intervention, whereas compression stockings should be disregarded for the management of orthostatic hypotension [23]. Similarly, abdominal binders can prevent this problem [2]. In addition, compression of the legs, physical counter maneuvers, and eating smaller and more frequent meals can be helpful [24].

As OH is a poorly reproducible clinical condition, it is likely that the simple measurement carried out during consultations underestimates the true prevalence of the condition. The measurement of blood pressure in a standing position is feasible without altering the quality of blood pressure readings in a seated position. It is significantly more often detected at home by the patient than at the doctor's office, which may allow quicker initiation of preventive and therapeutic strategies [9]. OH implies a persistent systolic/diastolic blood pressure decrease of at least 20/10 mm Hg upon standing [7], an exhaustive clinical history that includes comorbidities, medication compliance, current symptoms, and detailed physical examination with blood pressure measurements [22]. Therefore, the nurse can measure the orthostatic blood pressure and use the supine to stand test, and OH symptom assessment questionnaire for early detection of the risk for OH among elderly persons.

Significance of the study:

OH is common among elderly people [10]. The total prevalence of the problem ranges from 14.8% [1], to 56% [6]. It is a serious disorder [15], associated with several adverse health outcomes [25]. It is associated with cardiovascular diseases (Antoine et al., 2018) [9], stroke, cognitive impairment [13], reduced quality of life, increased risk 0f dementia [26], fractures, and mortality [27]. Early detection of OH can be performed through blood pressure measurements in the supine and standing positions [9]. There is no doubt that early detection of health problems that occur in elderly clients is an important aspect of nursing care. Therefore, elderly patients should be screened for the risk of OH even in the absence of symptoms. Consequently, nurses should play a role in the early detection of the risk of OH among elderly people to prevent its complications.

Aim of the study: the aim of this study was to detect the risk of orthostatic hypotension among elderly people.

Research questions:

Q1. How do the elderly people at risk for orthostatic hypotension?

Q2. What are the factors predicting orthostatic hypotension among the elderly people?

Subjects and method:

Research Design: A descriptive research design was used to achieve the aims of this study**.**

Setting: The current study was conducted at the Badr geriatric home and outpatient clinic of Fayoum university hospital, Egypt.

Subjects:
A total of 300 elderly persons were recruited for the study.

Sampling:
A convenience sample was recruited, using a non probability sampling technique. The study included 300 elderly persons for the study as participants. The researchers selected elderly people who met the following inclusion criteria: age 60 years and older, alert, had one or more risk factors for OH, and agreed to participate in the study.

Sample size: online sample size calculation was used by the researchers in the current study. It has been searched, reviewed, and checked for the calculated results based on known formulas for common research objectives [28]. The researchers calculated the number of the target population based on the flow rate of the subjects using the specific inclusion criteria. It were 1400 patients per year. The researchers calculated the sample size using the creative research systems sample size calculator website. https://www.surveysystem.com/sscalc.htm. Thus, the sample size was equal to 302 persons. 2 elderly persons were excluded from study. Therefore, the sample size was equal 300 elderly persons.

Tools for data collection:

 Three tools were used for data collection.

1. **Structured interview questionnaire**: This questionnaire was developed by the researchers after an extensive literature review. It consisted of three parts; 1) socio-demographic data, 2) precipitating factors predicting OH, and 3) measurements. **Part 1): The socio-demographic data** included patient age, sex, residence, level of education, working condition, marital status, and income. **Part 2): Precipitation factors predicting OH**. These was included altered factors such as the presence of chronic diseases, medications, anemia, gastroenteritis, carbohydrate-heavy meals, heat exposure or fever, prolonged bed rest, obesity, and recent weight loss. **Part 3): The measurements** included blood pressure, pulse, weight, and height. BMI was estimated by dividing weight in kilograms by the squared height in meters [BMI = weight (kg)/height (m) ^{2}]. A BMI of less than 18.5 was underweight, a BMI from 18.50 to 24.99 was considered normal, BMI from twenty five(25) to 29.9 was considered overweight, and BMI more than 30 was considered as obese [29].

2. **The Orthostatic Hypotension Symptom Assessment Questionnaire (OHSA)**: It is a valid patient report tool to quantify the symptom burden of people with OH. It has 2 domains: OH symptoms and their impact on walking. The 6-item OHSA assesses about dizziness/ lightheadedness, vision disturbance, weakness, fatigue, trouble concentrating, and head or neck discomfort. It also included questions about standing for a short time, standing for a long time, walking a short time, and walking a long time. Patients score items on a scale of 0 to 10 for the average severity of symptoms over the past week [30].

3. **Supine to stand test:** This provides a simple screening test for OH. Initial assessment for OH should include blood pressure and heart rate measurements after the patient has been supine (> 5 minutes), and again after 1 and 3 minutes of standing. OH is a sustained reduction of at least 20 mm Hg in systolic BP or 10 mm Hg in diastolic blood pressure within 3 minutes of standing [31].

Content validity and reliability:

The tools were developed by the researchers after reviewing of the related literature and tested for its content validity. Tools were submitted to a panel of three experts in the field of geriatric, community, and medical surgical nursing to test the content validity. Modifications were carried out according to the panel judgment on the clarity of the sentences and appropriateness of the content. Reliability analysis was conducted to investigate the **internal consistency of the instrument**, which used in the study; Cronbach's alpha coefficients were calculated to examine the measurement reliability with multipoint items. The accepted values are of **Cronbach's** alpha coefficient range from 0.60 to 0.95 [32]. The value of **Cronbach's** alpha coefficient for the study tools was 0.8.

Pilot study:

A pilot study was conducted in ten percent of the subjects. This sample were excluded from the total sample. It was carried out to assess the applicability and clarity of the constructed questionnaire, to determine the time needed to answer the questions, and to detect any problems that might arise during the actual collection of data. Subsequently, the necessary modifications and clarifications of some questions were carried out according to the results of the pilot study, and a final form was developed and used for data collection.

Field work:

Procedure for data collection:

Before starting any step in the study, official approval was obtained from the directors of the geriatric home and the hospital where the study was intended to be conducted. Permission to conduct the study was obtained from the responsible authorities after explaining the purpose of the study. Additionally, confidentiality of the information was ensured. Data collection for this study was carried out from the first of March 2021, and completed by the end of August 2021.

After obtaining agreement and informed consent to conduct the study, data were collected three days per week through an interview questionnaire with each elderly client by the researchers individually using the tools. First, verbal consent **was obtained from the participants** before the completion of the interview questionnaire sheet. Second, participants were informed about the aim of the study, and that the participation is voluntary and that they had the right to refuse to participate. As well, the participants were told that they can refrain from answering any question and they can terminate the interview at any time. The researchers carried out the interview face to face with each patient. The patients were requested to complete the questionnaire about the socio-demographic, risk factors, health related data, and the OH symptom assessment questionnaire. Then the supine to stand test was performed.

First the participants had to lie down and relax for at least five minutes. Then, an appropriate size cuff was placed on the arm, close to the level of the heart. The measuring devices used consisted of automatic devices. Blood pressure was measured once in lying position. After this measurement in lying position and without removing the cuff, the participant had to stand up, and then another one blood pressure measurement was immediately performed in standing position without delay. Systolic blood pressure and diastolic blood pressure values and heart rate were also recorded. Each client needs 25–30 min to complete the research questionnaires and the test.

Ethical considerations:

☐ After obtaining agreement and informed consent to conduct the study, data was collected three days per week through interviewing questionnaire with each elderly client by the researchers individually using the tools.

☐ First, verbal consent of the participants of the study was obtained before the completion of the interview questionnaire sheet.

☐ Second, participants were informed about the aim of the study, and that the participation is voluntary and that they had the right to refuse to participate.

☐ Oral consent was obtained from the participants who were willing to contribute in the study.

☐ The clients were informed that their involvement will be on voluntary basis, and anonymity and confidentiality of the participants were maintained at all times

Statistical analysis:

Data were coded, entered, and analyzed using the statistical package for social science (SPSS), version 23. Data were presented using statistics in the form of frequencies and percentage. Interval and ratio variables were presented in the form of means and SD. The χ2-test and correlation were used to determine the relationship among the study variables. The significance level was chosen as P-value less than 0.05

Results:

The study subjects included 300 elderly persons. Table (1) shows that 58.0 % of the studied elderly is aged from 60 to 69 years old and more than one third of them (34.0%) were aged from 70 to 79 years old. Also, 53.3% of the clients were males compared to 46.7% were females. Regarding the residence, more than three quarters of the participants (79.3%) were from rural areas and 40.0% of them were illiterate, not work (86.7%), and married (62.0%).

Table (1): Socio-demographic characteristics of the study participants (n=300).

Socio-demographic characteristics	Orthostatic hypotension		Total (n=300)	P-value
	Yes(n=72)	No(n=228)		
Age:				
60-69	48(66.7%)	126(55.3%)	174(58.0%)	x^2=3.01
70-79	20(27.8%)	82(36.0%)	102(34.0%)	p>0.05
80+	4(5.6%)	20(8.8%)	24(8.0%)	
Sex :				
Male	41(56.9%)	119(52.2%)	160(53.3%)	x^2=0.05
Female	31(43.1%)	109(47.8%)	140(46.7%)	p>0.05
Residence :				
Rural	62(86.1%)	176(77.2%)	238(79.3%)	x^2=2.06
Urban	10(13.9%)	52(22.8%)	62(20.7%)	p>0.05
Education:				
Illiterate	33(45.8%)	87(38.2%)	120(40.0%)	x^2=3.8
Primary	14(19.4%)	58(25.4%)	72(24.0%)	p>0.05
Secondary	18(25.0%)	46(20.2%)	64(21.3%)	
University	7(9.7%)	37(16.2%)	44(14.7%)	
Working condition:				
Still Work	8(11.1%)	32(14.0%)	40(13.3%)	x^2=0.4
Not work	64(88.9%)	196(86.0%)	260(86.7%)	p>0.05
Marital status:				
Single	0(0.0%)	6(2.6%)	6(2.0%)	x^2=10.7
Married	36(50.0%)	150(65.8%)	186(62.0%)	p<0.05*
Widow	32(44.4%)	58(25.4%)	90(30.0%)	
Divorced	4(5.6%)	14(6.1%)	18(6.0%)	

Figure (1) illustrates that 24.0% of the elderly clients were suffered from OH Based on Supine to stand test. OH is a sustained reduction of at least 20 mm Hg in systolic BP or 10 mm Hg in diastolic blood pressure within three minutes of standing.
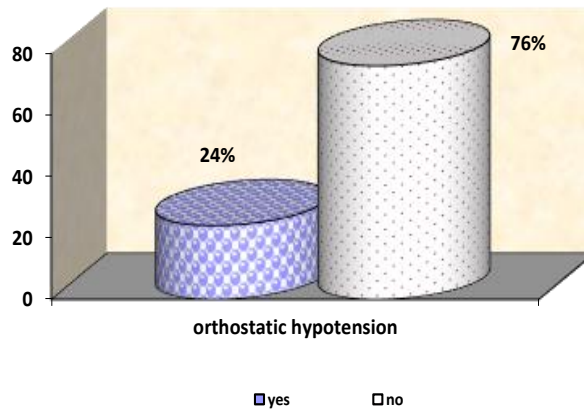
Figure (1): Distribution of the studied elderly people according to risk of OH (n=300).

Table (2) reveals that the mean supine systolic blood pressure was 139.1±18.3 at the first measurement. Then it became 130.02±25.9 after the supine to stand test performance, and 126.4±22.9 after 3 minutes. In addition, the supine diastolic blood pressure reduced from 88.6±11.04 to 84.6±6.4 after 3 minutes among the elderly clients who suffered from the OH. This explains the reduction of both the systolic and diastolic blood pressure among the patients who indicate the risk of OH among the elderly clients.

Table (2): Comparison of blood pressure and heart rate for the elderly people with and without OH.

Variables	Orthostatic hypotension		P value
	Yes	**No**	
Supine systolic blood pressure, mm Hg	139.1±18.3	135.4±28.7	t=1.02 P>0.05
Supine diastolic blood pressure, mm Hg	88.6±11.04	84.7±15.1	t=2.01 P<0.05*
Supine heart rate per minute	85.3±6.1	86.3±6.5	t=1.2 P>0.05
Standing systolic blood pressure, mm Hg (after 1min)	130.02±25.9	131.2±26.7	t=0.3 P>0.05
Standing diastolic blood pressure, mm Hg (after 1 min)	85.7±10.7	82.8±15.8	t=1.4 P>0.05
Standing systolic blood pressure, mm Hg (after 3minutes)	126.4±22.9	139.2±33.02	t=3.1 P<0.05*
Standing diastolic blood pressure, mm Hg (after 3 minutes)	84.6±6.4	83.5±11.9	t=.8 P>0.05

Table (3) presents that, take long time for shower (86.1%), prolonged bed rest (55.6%), carbohydrate-heavy meals (54.2%), obesity (52.7%), hypertension (43.1%), diabetes mellitus (36.1%), cardiac diseases (27.8%), and anemia(16.7%) were the main precipitating factors predicting OH among the elderly clients.

Table (3): Precipitating factors predicting OH among the elderly clients.

Precipitating factors	Orthostatic hypotension		P-value
	Yes N (%)	No N (%)	
Diabetes mellitus	26(36.1%)	62(27.2%)	x^2=2.1 p>0.05
Cardiac disease	20(27.8%)	54(23.7%)	x^2=0.5 p>0.05
Anemia	12(16.7%)	20(8.8%)	x^2=3.6 p<0.05*
Hypertension	31(43.1%)	107(46.9%)	x^2=0.3 p>0.05
Carbohydrate-heavy meals	39(54.2%)	105(46.1%)	x^2=1.4 p>0.05
Heat exposure	8(11.1%)	8(3.5%)	x^2=6.2 p<0.05*
Prolonged bed rest	40(55.6%)	98(43.0%))	x^2=3.5 p>0.05
Body mass index: Under weight Normal weight Overweight Obese	0(0.0%) 34(47.2%) 24(33.3%) 14(19.4%)	0(0.0%) 134(58.8%) 68(29.8%) 26(11.4%)	x^2=4.1 p>0.05
Take long time for shower	62(86.1%)	178(78.1%)	x^2=2.2 p>0.05

Concerning the symptoms of OH, table (4) presents that the fatigue (3.8±2.7), headache (3.6±1.9), general weakness (3.54±1.8), blurred vision (3.25±2.8), and poor concentration (3.02±1.8) were the most common complaints among the clients.

Table (4): the mean score for severity of OH symptoms among the studied clients.

Symptoms	Orthostatic hypotension (n=72)		
	Mean ±SD	Minimum	Maximum
Dizziness	2.3±1.6	1	5
blurred vision	3.25±2.8	1	10
Weakness	3.54±1.8	1	8
Fatigue	3.8±2.7	2	10
Poor concentration	3.02±1.8	1	7
Headache	3.6±1.9	1	8

As regards the effect of OH on the activities of daily living, Table (5) indicates that the OH affected the daily living activities that require walking (5.9±3.6) or standing for a long time (5.8±3.4) among the elderly clients.

Table (5): OH impact on daily living activities for the studied subjects.

Orthostatic hypotension impact on activities:	Orthostatic hypotension clients			
	Mean ± SD	Minimum	Maximum	Range
Activities that require standing for a short time	4.9±3.01	1	9	8
Activities that require walking for a short time	5.3±2.9	1	9	8
Activities that require standing for a long time	5.8±3.4	1	10	9
Activities that require walking for a long time	5.9±3.6	1	10	9

Discussion:

Orthostatic hypotension or postural hypotension is a common complaint in the elderly [33] and is associated with changes in autonomic regulation of blood pressure and heart rate [34]. It is related to an increase in the mortality rate [33]. The morbidity and mortality related to OH have become a topic of debate [19]. It may complicate the treatment of hypertension and cause disabling symptoms, faints, and traumatic injuries. Besides, it increases the incidence of stroke, atria fibrillation [7], ischemic heart disease [19], and deterioration of the quality of life [12]. So, early detection and referral of elderly persons with OH can prevent many complications. Three hundred elderly clients were included in the current study to detect the elderly people at risk for orthostatic hypotension.

The results of the present study reported that more than half of the studied elderly were aged from sixty to sixty-nine years old and more than one-third of them were aged from seventy to seventy-nine years old. In addition, more than fifty percent of the clients were males compared to forty-six percent were females. Regarding the residence, more than three-quarters of the participants were from rural areas and more than forty percent of them were illiterate, not working, and married (table 1). Moreover, figure (1) illustrates that about one-quarter of the elderly clients were suffered from OH Based on Supine to stand test. This comes in accordance with the studies which reported that, the prevalence of OH increases with age, 30% of patients older than seventy years, and up to fifty percent of nursing home patients older than eighty years old [35,22]. Likewise, Jones, Shaw & Raj, (2015) stated that among patients with autonomic dysfunction, 40% to 80% of patients have postprandial hypotension [36].

Concerning the main measurements for systolic and diastolic blood pressure, table (2) explained that the mean supine systolic blood pressure was 139.1±18.3 at the first measurement. Then it became 130.02±25.9 after the supine to stand test performance, and 126.4±22.9 after 3 minutes. In addition, the supine diastolic blood pressure reduced from 88.6±11.04 to 84.6±6.4 after three minutes among the elderly

individuals who suffered from the OH. This explained the reduction of both the systolic and diastolic blood pressure among the patients who indicate the risk of OH among the elderly subjects. At the same line, most of the previous studies reported a reduction in their measurements. The study performed by Shaw et al., (2018) stated a mean decline in systolic blood pressure during the supine-to-standing test (58.7 ± 1.5 mmHg). Also, they mentioned that in those without OH, systolic blood pressure increased during supine-to-standing testing on average by 3.6 ± 0.6 mmHg. Specifically, 43% of the patients had OH, 37% had diastolic blood pressure OH, and 34% of these subjects met both criteria during testing. One investigation showed a decrease in systolic blood pressure of more than 15 mm Hg or diastolic blood pressure of more than seven mm Hg to yield the highest sensitivity and specificity for the OH [37, 45]. Moreover, OH of central origin is generally associated with other un-autonomic signs, such as abnormal heart rate regulation. There was no association between heart rate variability [38, 47].

Orthostatic hypotension can be caused by many factors. It is more frequent in patients with diabetes mellitus [39]. It can occur occasionally depending on the medications being taken [40, 46]. Also, medications, chronic renal failure, dehydration, metabolic causes, heavy metals, anemia [41, 48], physical reconditioning, urinary tract infection, and Parkinson's disease are additional causes of OH [31,39]. At the same line, the results of the present study revealed that taking a long time to shower, prolonged bed rest, carbohydrate-heavy meals, obesity, hypertension, diabetes mellitus, cardiac diseases, and anemia were the main precipitating factors predicting OH among the elderly clients (table 3).

Likewise, the present study findings come in agreement with Cremer et al., (2017) who mentioned that diabetes mellitus is a frequent cause of OH. However, there is no significant difference in diabetes mellitus distribution according to OH status [38]. Moreover, it can occur in otherwise healthy people when faced with severe hypovolemic or vasodilatory stress. It is also associated with hypertension, chronic kidney disease, and cognitive impairment [39]. Also, Clark et al., (2018) mentioned that digoxin use, Parkinson's disease, hypertension, stroke, or cardiovascular disease are factors predicting postural hypotension [17]. While Cremer et al., (2017) stated that patients with OH had an increased cardiovascular risk compared with participants without OH, were older, had a higher proportion of cardiovascular history, and had higher systolic blood pressure [38].

There is no doubt that the researchers are interested to study the precipitating factors of OH such as eating large and carbohydrate-heavy meals which induce splanchnic vasodilatation and redistribution of blood flow to the digestive system [42]. This comes in agreement with the present study results which stated that prolonged bed rest, carbohydrate-heavy meals, and obesity are factors predicting OH among the elderly clients (table 3).

Concerning the symptoms of OH, it is often accompanied by dizziness, fatigue, vision disturbance, and loss of concentration, which can greatly hinder the quality of life [43]. These results come in accordance with the results of the current study which denoted that fatigue, headache, general weakness, blurred vision, and

poor concentration were the most common complaints among the clients (table 4). Also, typical OH symptoms, which occur when standing, less frequently when sitting, and abate when lying down, included dizziness, lightheadedness, blurred vision, weakness, fatigue, nausea, palpitations, and headache. While the less common symptoms include syncope, dyspnea, chest pain, and neck and shoulder pain [42, 44].

As regards the effect of OH on the activities of daily living, table (5) illustrated that the OH affected the daily living activities that require walking or standing for a long time among the elderly clients. These results come in the same line with the previous studies which stated that OH is associated with impaired motor performance. It may negatively affect physical functioning and activities [15]. Furthermore, it may complicate the treatment of hypertension, heart failure, and cause disabling symptoms [7].

Conclusion:

Based on the findings of the present study, 24.0% of the elderly persons were suffered from OH Based on Supine to stand test. Also, taking a long time to shower, prolonged bed rest, carbohydrate-heavy meals, obesity, hypertension, diabetes mellitus, cardiac diseases, and anemia were the main precipitating factors predicting OH among the elderly clients.

Recommendations:

1- Elderly persons with hypertension or diabetes mellitus should receive regular monitoring of blood pressure to detect orthostatic hypotension and prevent its complications.

2- Orthostatic blood pressure measurements should be included in the assessment of all older adults.

Declaration of Conflicts of Interest:

There is no conflict of interest between researchers.

Ethical Use of Images

There is no images

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