

Behavioral and psychological assessment of recurrent fall risk and the correlates to perceived ability of fall management among Community-dwelling older adults

Marwa Ibrahim Mahfouz Khalil

(Lecturer, Gerontological Nursing, Faculty Of Nursing, Alexandria University, Egypt)

Corresponding Author: Marwa Ibrahim Mahfouz Khalil

Abstract: *The major health concern for community dwellers' aged group recently represented by recurrent fall events. Normal aging process inevitably included sensory, musculoskeletal, neurological, and metabolic changes; that sufficient to bring physical, cognitive and affective consequences sustain to the risk of falls. Long-term effects of falls-related factors predisposed to economic burden, complex injuries, lengthy hospitalization and rehabilitation, immobility complications, psychological effects as fear of falling experience, and lacked support and social contacts which significantly impacted negatively on elders' functioning and wellbeing. Although the medical and biological risk factors are important, less searched behavioral and psychological factors mustn't be ignored due to the dual relation they played with other risk factors. In addition, the perceived ability to manage and control over falling in highly risk elderly and its relation to other factors remains unclear. It worth mentioned that previous researches confirmed that falls self-reported can be decreased by between 30% to 40% by performing a multi-factorial fall risk screening especially those behavioral and psychological contributing factors, which stimulate elders' ability to prevent fall-moderating situations and master controlling over unexpected fall-leading events. So, this study conducted to describe behavioral and psychological factors concerning the risk of recurrent falls among community dwelling older adults and the correlates to elders' perception of their ability to control and manage falls. The study followed a descriptive correlational research design and proceeded in the outpatient clinics followed three main districts of medical health for older adults in Alexandria, Egypt selected generally using multistage sampling. 235 male and female elderly community residents aged 60 years and older, at a medium- to high-risk of falling on the elderly falls screening test were enrolled in the study. Nine tools used to collect data namely: (I) Mini- Mental State Examination Scale, (II) Elderly Falls Screening Test, (III) General Characteristics and Clinical Data Structured Interview Schedule, (IV) The Falls Behavioral Scale, (V) Modified Version of the Survey of Activities and Fear of Falling in the Elderly, (VI) Consequences of Falling Scale, (VII) Center for Epidemiological Studies Depression Scale, (VIII) Perceived Control Over Falling Scale, and (IX) Perceived Ability to Manage Falls Scale. The main findings of the study implied that the most contributing fall-protected behavioral and habitual patterns score was observed among those behaviors concerning displacing activities (80.71±24.20). While, being observant for particular hazards (39.36±19.50) was the most risk-related behavioral factors. Depressive symptomatology (mean % score= 62.43%) stated as the most influence psychological risk factors of recurrent falls. Unfortunately, perceived lacking ability to either manage or control fall-leading situations was the configuring picture among a significant percent. The research provided a valuable conclusion through the proved inverse relationship found between behavioral protecting and psychological predisposing factors of recurrent falls among the elderly dwelled in community and their perceived ability to both control and manage falls incidents. So, we recommended that behavioural and psychological fall-related factors should be an integral part in the comprehensive assessment of all elderly community dwellers in general and those with advanced age, frail, chronic comorbidities, illiterate, mobility problems, sensory deprived, on polypharmacy, and recurrent fall sufferers. Great attention should be paid to the increased incidence of depression among elders with a history of falls, and their behavioral and environmental modifications to essentially provided adequate interventions and implement educational programs for the purpose of elevated their level of perception regarding fall management.*

Keywords: *Behavioral factors, elderly community dwellers, gerontological nurses, psychological factors, managing falls, recurrent falls*

Date of Submission: 13-07-2018

Date of acceptance: 29-07-2018

I. Introduction

On annual basis, approximately 37.3 million of fall events among elderly dwelled in the community occur worldwide which are nonfatal but severe enough requiring medical interventions ⁽¹⁾. Frequency of falls documented to be rated high in Egypt (60.3%) ⁽²⁾, in comparison with China (18%) ⁽³⁾, Sweden (19.1%) ⁽⁴⁾ and Nigeria (23%) ⁽⁵⁾. The disparities between the studies might result from the reality that falls are associated with multiple factors including biological, behavioral and circumferential factors as environment ⁽⁶⁾. About one quarter of the elderly dwelled in the communities and more than half of those confined to assisted living facilities fall at least once every year and nearly half of those fallers experienced recurrent falls. ^(1,7,8)

Falls are hidden problems among a large proportion of elderly settled in community which triggers a serious of other problems and responsible for considerable immobility, morbidity and subsequent mortality if not adequately managed. The frequency of fall accident increases steadily as age and frailty level heightened. Falls threatened the maintenance of independence; the last is the fundamental goals for elderly care. Elders who frequently fall, are susceptible to prolonged hospital stay due to fall- related unintentional injuries such as soft-tissue bruising or superficial wounds, traumatic brain injuries, sustain fractures and pressure sores; additional treatment expenses; decreased health- linked quality of life and involuntary relocation to the assisted living facilities. ⁽⁹⁾

Identifying the high-risk group of older adults prone to fall, to improve or maintain prosperity, is a crucial step in late life. Older adults are especially prone to fall as many physiological processes show a decline in functional capacity as age increases. Age-induced sensory deficits (visual and hearing impairment) are especially likely to produce imbalance and a disequilibrium syndrome. Central and peripheral nervous system in conjunction with musculoskeletal changes can predispose older persons to fall due to slower reaction time and gait speed; and forfeit of muscle mass and strength ⁽¹⁰⁾.

The fact that falls occur in the old-aged individuals as a result of complex interacted risk factors, must be clear to those closely or not directly care of this segment of the population. The main hazardous factors assorted into four dimensions: biological, behavioural/ psychological, environmental and socioeconomic factors. Unfortunately, most literatures and health care personnel pay great alertness and concern to the physiological or environmental falls-specific risk assessment as a focused post-fall evaluation or systematic risk factor screening among risky older adults, rather than the other multi-factorial behavioural and psychological causes which could prone elders to fatal falls as so biological do. All of these determinants can interplay with each other to determine how low or high is the risk of falling, or its sustaining serious results. ⁽¹¹⁾

The psychological effects associated with falling often result in a fear of falling which itself is a hazardous-related factor for future falls. Fearing from fall occurs in the older-aged people who fell as well as those who didn't experience falls before and leads to a vicious cycle in which the elder who has fallen begins to avoid previously performed activities. The restriction of mobility following a fall has been called the post fall syndrome which characterized by poor functional prognosis, dependence, acute confusion, loss of autonomy, depression, immobilization and an abnormal hesitant gait developed to compensate for fear of falling and then leads to losses in the strength and flexibility of joint mobility and further restriction in daily activities resulting in recurrent falling. In addition to a fear of physical harm, functional incapacity and loss of independence, there are other fearful consequences of falls that can motivate activity avoidance (e.g., fear of social embarrassment, fear of pain and suffering, fear that a fall is an indicator of terminal physical decline). ⁽¹²⁾

Behavioural risk factors of falls include those concerning elders' lifestyle, actions and daily choices. Those behaviours include sedentary lifestyle, climbing ladders, standing on unsteady chairs or bending while performing activities of daily living, rushing with little attention to the environment or not using mobility devices prescribed such as a cane or walker, wearing poor fitting shoes, walking barefoot or in socks without shoes or in slippers without a sole, high heels, thin and hard soles, or slippers of unsuitable size and that do not stick closely to the feet, all are risk - taking behaviours. ⁽¹³⁾

The impact of fall on the perceived ability of the elderly to control the fall episodes or to manage it is profound. Falls affect negatively elders' perception of the degree of contentment with and capability to perform and control different facets of one's life. It is true that culture traditions affect to the large extent the perception of falls and managing it. Most societies perceive falls in old age as an inevitable part of growing old, accidents that are largely unavoidable, or maintain safety for older adults is not a matter of priority. These perceptions can force older adults to adopt sedentary lifestyle, isolate, and relinquish social participation with a resulting of falls risk and impaired perception of ability to control or manage such event. Older adults' attitude on how they cope with fall influences the methods of fall- avoidance behaviours. ⁽¹⁴⁾

A number of interventions prove its effectiveness in protect elders from hidden fall hazards in daily activities.. They are all centred in expression of valuing older adults by allocation of adequate community resources helping them to age in dignity and establish measures to heighten the quality of their lives which are the keys for successful and productive aging. For instances, avoid smoking, planning balance and strength training, environmental modifications, well balanced nutrition, maintaining recommended weight, optimum

level of physical activity, social engagement, and careful alertness to medication prescription especially polypharmacy, interactions and side effects.⁽¹⁵⁾

Crucial to the success of such polices is changing the attitudes and beliefs of the older adults themselves which is a key ingredient to avoid falls. This could be achieved by promoting self- health behaviours within their ability and perceive their benefits. Managing behavioural and psychological risk factors are crucially important as well as the other related biological and environmental risk factors, in order to counterbalance the disturbed factors that can precipitate the onset of falls. Protective factors of falls can be achieved through behavioural changes to healthier lifestyle.⁽¹⁶⁾

Changing the idea of acceptance of fall as normal as one ages is more important than the interventions taken to prevent it. Reduction of the falls shouldn't be assumed to just adapt action to avoid activity restriction, environmental safety or use of mobility aids. Emphasis should extend much broader to change elders' decision, choices, and health- seeking behaviours, fear of falling and perceived capabilities in fall management by exploring of the most contributing behavioural and psychological factors. The gerontological nurses play a key role in assisting and supporting the elderly persons to achieve and maintain optimum health and safety by identification of the high risk group for falls in older population.⁽¹⁷⁾ So, this study aimed to describe behavioral and psychological factors lead to risk of recurrent falls among community dwelling older adults and the correlates to perceived ability to control and manage falls.

1.1 Research Questions

1. What are the behavioural and psychological factors concerning recurrent falls risk among community-dwelling older adults?
2. What is the relation between behavioural and psychological factors concerning recurrent falls risk and community - dwelling elders' perceived ability of fall management (perceived ability to control and intervene fall)?

II. Materials And Method

2.1 Design: The study followed a descriptive correlational research design.

2.2 Setting: The study conducted at the outpatient clinics followed three main districts of medical health in Alexandria for older adults: University Hospitals Outpatient Clinics, Clinics affiliated to Health Insurance, and Health Affairs Directorate Clinics of Health Ministry. The outpatient clinics of each apartment selected generally using multistage sampling in which simple randomization of all clinics following the three districts was done to select only two districts of each. Within the districts chosen with multiple outpatient clinics that serve elders' health needs; only two outpatient clinics were chosen according to two criterion:-

1. the highest number of elder attendance **and**
2. which are mostly pertaining to the study purpose.

Table (1) Name of affiliated places within the districts of outpatient clinics for elders in Alexandria

| Districts of Outpatient clinics for elders in Alexandria | Name of affiliated places |
|---|--|
| 1> General Organization of Health Insurance | 1. The outpatient clinics of Alexandria Health Insurance Clinic (Gamal Abd El-Nasser Hospital) namely; medical clinic and surgical clinic 2. El Montaza Health Insurance Clinic |
| 2> University Hospitals | 1. The outpatient clinics of the Main University Hospital namely; geriatric clinic and physiotherapy clinic 2. The outpatient clinics of El Hadara University Hospital namely: orthopedic clinic and neuropsychiatric clinic. |
| 3> Health Affairs Directorate Clinics of Health Ministry. | 1. The outpatient clinics of Shark El Madina Hospital namely: renal clinic, and medical clinic 2. The outpatient clinics of Farouk Hospital (ophthalmology) |

2.3 Subjects:

The study subjects chosen followed a convenience sampling type, attended to the previously selected settings and fulfilling the following **inclusion criteria, selected and participated in the study**:-

1. Male and female elderly persons aged 60 years and older.
2. Community-dwelling subjects who had a history of at least one incidence of fall during the previous 12 months.
3. At a medium-risk (Evidence of Risk ≤ 3) to high-risk (Evidence of Risk in > 3 factors; especially I – V) of falling on the elderly falls screening test (EFST).
4. Scoring 24 – 30 on the Mini-Mental State Examination Scale indicating absence of cognitive impairment in order to follow instructions and effectively respond.
5. Agree to participate in the study.

Their number amounted to 235 community dwelling older adults based on the program Epi info 7 which was used to estimate the sample size based on the statistical parameters using 5% possible allowable error and the confidence co-efficient 94%.

2.4 Tools of data collection:

Pre- inclusion assessment using tools I and II

Tool (I): Mini- Mental State Examination (MMSE) Scale^(18,19)

Developed by Flostein (1975)⁽¹⁸⁾ to assess the elderly cognitive function. It consists of 10 items that investigate the memory, orientation to time and place, attention, calculation, naming, repetition, registration, language, praxis and copying of a design. It was translated into Arabic language, being valid and reliable by El-Okl (2002).⁽¹⁹⁾ **The scoring system of MMSE was:** The maximum score is 30, (24- 30) No cognitive impairment, (18- 23) Mild cognitive impairment, and (0-17) Severe cognitive impairment.

Tool (II): Elderly Falls Screening Test⁽²⁰⁾

EFST is a validated outcome measure to assess risk factors for falls in the geriatric population. It includes ten factors (unpredictable fall events due to sudden syncope, sensory problems, medication risk, significant medical problems, cognitive problems, mobility problems, environmental hazards, and balance; endurance and joints problems). Elders is considered at a medium-risk (Evidence of Risk ≤ 3) to high-risk (Evidence of Risk in > 3 factors; especially I – V) of falling on the elderly falls screening test.

Tool (III): General Characteristics and Clinical Fall-related Data Structured Interview Schedule

This tool was developed by the researcher based on relevant literature. It included information about:-

- General characteristics of the elderly community residents such as age, sex, marital status, level of education, and pre-retirement occupation.
- Medical health history predispose elders to recurrent falls: - It included questions about presence of chronic diseases and syndromes mostly leading to falls, medications taken predispose elders to falling, and use of assistive devices.
- Falls history:- Number of falls within the previous year, presence of injury following falls, modification of elders' usual activities following falls, falling report to health care providers, contributed behaviors to falls, and common methods followed by older adults to prevent recurrent falls

Behavioral factors concerning recurrent falls were measured using the following tool

Tool (IV): The Falls Behavioral (FaB) Scale;_ [Clemson and colleges (2003)]⁽¹⁰⁾

An assessment tool designed to identify the older person's awareness and practice of behaviors that potentially protect against falling. The FaB includes the kinds of day-to-day behaviors and actions, both habitual and intentional, that if not done safely can place the elderly at undue risk of falling. The FaB Scale is a list of 30 statements that describes the things elderly done in everyday lives. Ten behavioral dimensions identified as the following:- (1) Cognitive Adaptations describe behaviors associated with thinking and planning, (2) Protective Mobility are strategies used when negotiating the environment in a protective or supportive manner, (3) Awareness includes behaviors associated with noticing things such as traffic way hazards, (4) Avoidance involves keeping away from risky situations, (5) Pace identifies the avoidance of doing things quickly, (6) Practical Strategies present the anticipation or planning, (7) Displacing Activities are avoiding activities that cause displacement, in particular, going out on windy days, (8) Being Observant summarizes behaviors associated with being observant or vigilant in looking out for particular hazards, (9) Changes in level denotes behaviors about coping with changes in levels especially higher activity levels), (10) Getting to the phone clarify the careful practice in getting to or reaching for things such as the phone. The elderly community residents are encouraged to provide a rating (Never, Sometimes, Often, or always) for each statement and to avoid the "Doesn't apply" category unless absolutely necessary. Six items (7, 8, 9, 10, 19, and 23) were reversed prior to data analysis to ensure accuracy. High scores equal the safest behaviors while low ones reflected the riskiest behaviors.

Psychological factors concerning recurrent falls was measured using tools from (V) to (VII)

Tool (V): Modified Version of the Survey of Activities and Fear of Falling in the Elderly (mSAFFE)

Developed by Yardley and Smith (2002)⁽²¹⁾ from the original version of the instrument developed by Lachman and colleges (1998)⁽²²⁾. It used to assess the role of fear of falling in activity restriction. Using a 3-point Likert response format (range 1-3), the mSAFFE requires elderly participants to view a list of 17 activities (i.e., 5 ADL / IADL; e.g., taking a bath or shower), 9 mobility (e.g., going out when it is slippery), 3 social (e.g., visiting friends and relatives) and determine whether they would never avoid, sometimes avoid, or always avoid

the activity because they were afraid they might fall over. The total mSAFFE score, which ranged from 17 to 51, was calculated by summing the responses across the 17 items in the scale. Higher mSAFFE scores reflected higher levels of activity restriction.

Tool (VI): Consequences of Falling Scale (CoF) (Yardley and Smith, 2002) ⁽²¹⁾

A 12-item, self-report questionnaire using 4-point Likert response scale (i.e., 1 = “disagree strongly”, 2 = “disagree”, 3 = “agree”, 4 = “strongly agree”); used to assess perceived consequences of falling among community-dwelling elderly. It includes Loss of Functional Independence (CoF-LFI) and Damage to Identity (CoF-DI) subscales. The CoF-DI subscale consists of items regarding difficulty getting up, causing a nuisance, losing confidence, embarrassment, pain, and feeling foolish (items No, 1, 2, 3, 6, 7, and 9); while the CoF-LFI subscale assesses being less active, losing independence, becoming disabled, being severely injured, helpless, and unable to cope (items No 4, 5, 8, 10, 11, and 12). Scores for each of the subscales were calculated by summing the scores (ranged from 1 to 4) for the six items in each scale, and a total CoF score was calculated by summing the scores on all 12 questions. Higher scores reflected greater perceive of the negative consequences of falls..

Tool (VII): Center for epidemiological studies depression scale (CES-D; Radloff, 1977) ⁽²³⁾

It is a 20-item self-report likert-type scale that asked elderly participants to indicate the weekly frequency/ duration of depressive symptoms. The items in the CES-D scale helped patients begin to discuss previously nebulous symptoms, especially those patients who presented with physical symptoms of depression such as headache or insomnia. CES- D covered affective, psychological and somatic symptoms. The scale emphasized affective components, such as mood, guilt, worthlessness, helplessness, loss of appetite, and sleep disorders. It was translated into Arabic language, being valid and reliable by Mahfouz (2010). ⁽²⁴⁾ (alpha= 0.766). Responses ranged from (0) (rarely or none of the time/ less than 1 day) to (3) (most or all of the time/5-7 days). Items 4, 8, 12, 16 were phrased positively and thus scored in the opposite order. Overall scores ranged from 0 to 60, with higher scores representing higher levels of depressive symptoms. Participants were dichotomized into depressed (CES-D of mean scores of 30 and greater on 60) and non- depressed participants (CES-D of mean scores of less than 30 on 60).

Elders’ perceived ability to control and manage falls was measured using tools (VIII) and (IX)

Tool (VIII): Perceived Control over Falling Scale

PCOF [Lawrence and colleges, 1998] ⁽²⁵⁾ was developed to gain a better understanding of different fall-related dimensions of efficacy among community-dwelling older adults. It assessed an older adult’s ability to control their mobility while preventing falls and reducing fear of falling in their own environment. The PCOF scale consisted of four items that are rated on a 5-point Likert response scale (1 = “strongly disagree”, 2 = “disagree”, 3 = “unsure”, 4 = “agree”, 5 = “strongly agree”). The total PCOF score was calculated by averaging the scores from all four items and scores ranged from one to five, with higher scores reflecting higher levels of control over falling.

Tool (IX): Perceived Ability to Manage Falls Scale

PAMF [Lawrence and colleges, 1998] ⁽²⁵⁾ assessed an older adult’s beliefs regarding their confidence and ability to avoid falls and manage falls if they occur. It consisted of five items that were rated using a 4-point Likert scale (from 1 = “not at all sure”, to 4 = “very sure”). The total score was calculated by averaging the scores from all five items and it ranged from one to four, with higher scores reflecting higher ability to manage falls.

2.5 Methodology

1. Official letters were issued from the Faculty of Nursing, Alexandria University to the administrators of the study settings to obtain their permission to carry out the study after explaining the purpose of the study. Then, a written approval to carry out the study was obtained from the hospital responsible authorities at the previous mentioned settings. Lastly, the head of the outpatient clinics was informed about the purpose of the study, and the date and the time of starting data collection.
2. Tool II (General characteristics and clinical data structured interview schedule) was developed by the researcher based on a thorough literature review.
3. The Arabic version of tool I and tool VII was used for data collection
4. The other tools of the study were translated by the researcher into Arabic and were tested for content validity by seven (7) experts in the related fields of Gerontological Nursing, Medical Surgical Nursing, Geriatric Medicine and Orthopedic Surgery.

5. The reliability of the tools was tested by using Alpha Cronbach’s statistical test for internal consistency of tool items. Alpha Cronbach’s reliability of tools was (0.859 for tool IV, 0.911 for tool V, 0.805 for tool VI, 0.741 for tool VIII, and 0.865 for tool IX).
6. A pilot study was carried out on thirty-two (32) older adults selected from a setting not included in the study (El-Wafaa elderly club) to assess the applicability, clarity and feasibility of the study tools, and necessary modifications were done accordingly.
7. Assessment of elders using tools I and II was performed initially before the actual participation of the elders to determine those fulfilled the study criteria.
8. Each elderly who fulfills the inclusion criteria was interviewed individually in the outpatient clinics in order to collect the necessary data.
9. Data were collected over the duration of 14 months from the beginning of November 2015 till the last of January 2017.

2.6 Ethical considerations:-

An informed written consent was obtained from each study subject included in this study after appropriate explanation of the study purpose. Study subjects’ privacy and confidentiality of the collected data were maintained.

2.7 Statistical analysis of the data:-

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, and standard deviation. Significance of the obtained results was judged at the 5% level. **The used tests were: (1) Student t-test** for normally distributed quantitative variables, to compare between two studied groups, **(2) F-test (ANOVA)** for normally distributed quantitative variables, to compare between more than two groups, and **(3) Pearson coefficient** to correlate between two normally distributed quantitative variables.

III. Results

Results entail four partitions/sections;

Section I. General Characteristics, clinical data, fall history, daily behaviors contributing to falls, and its related preventive methods among the elderly community dwellers.

N.B: Table (1) was discussed previously in “Materials and Method” research section.

Regarding the general characteristics of the elderly community dwellers, table (2) illustrates that the total number of elderly community dwellers included in this study was 235. Less than two thirds (62.6%) were within the 60 – 70 age ranges. According to the percent distribution of participation in the study from the elderly housed in the community , the mostly representative studied variables were male gender (63%), illiteracy or just read and/or write (48.9%), manual working (crafting) (28.9%), being married (64.7%), and living with family (76.2%).

Table (2): General characteristics of the elderly community dwellers (n=235).

| General characteristics of the elderly community dwellers | Frequency | Percent |
|---|--------------------|---------|
| Age (years) | | |
| 60 – 70 | 147 | 62.6 |
| ≥70 | 88 | 37.4 |
| Min. – Max. | 60.0 – 85.0 | |
| Mean ± SD. | 68.42±4.64 | |
| Gender | | |
| Male | 148 | 63.0 |
| Female | 87 | 37.0 |
| Level of education | | |
| Illiterate, read and write | 115 | 48.9 |
| Primary education | 65 | 27.7 |
| Secondary education | 38 | 16.2 |
| University and Higher education | 17 | 7.2 |
| Occupation before retirement: | | |
| Manual worker | 68 | 28.9 |
| House wife | 51 | 21.7 |
| Employee | 55 | 23.4 |

| | | |
|--------------------------|-----|------|
| Free business | 61 | 26.0 |
| Marital status | | |
| Married | 152 | 64.7 |
| Widow | 66 | 28.1 |
| Divorced | 9 | 3.8 |
| Single | 8 | 3.4 |
| Living condition: | | |
| With family | 179 | 76.2 |
| Alone | 56 | 23.8 |

SD - Standard Deviation

In accordance to the health-related data contributing to falls among the elderly resided in the community, table (3) reflects the prevalence of varied health problems among all studied seniors, where osteoarthritis (43.0%), followed by ophthalmological problems (39.1%) ranked as the most encountered health problems associated with falls among the studied group. Movement disorders in the form of gait disturbance (35.7%), osteoporosis (31.9%), and foot problems (30.6%) were also from the reported causes. Less frequently identifiable problems included diabetes mellitus (27.2%), urinary incontinence (25.1%) and coronary artery diseases (21.7%) as reflected by the involved residents respectively. Less than a third (31.5% and 29.8% respectively) followed a prescription of either two or one medication (s). Analgesics and anti-inflammatory were the most fall-leading drugs consumed by the participants (40.4%), followed by diuretics (30.6%), anticoagulants (21.3%), and hypnotics (16.2%), whereas antidepressants and muscle relaxants reported lastly at the ranking list of cause (3.8% and 3.4% respectively). More than fifty percent (54.5%) used assisted living aids in which eye glasses were the most commonly manipulated aids among the involved participants (71.9%).

Table (3): Medical history and fall-related data of the elderly community dwellers (n=235).

| Medical history and fall-related data of the elderly community dwellers | Frequency | Percent |
|--|------------|-------------|
| <ul style="list-style-type: none"> • Presence of health problems that can lead to fall: • Type of documented fall- related health problems:# | 235 | 100.0 |
| Osteoarthritis | 101 | 43.0 |
| Ophthalmological diseases/ visual problems | 92 | 39.1 |
| Gait disturbance | 84 | 35.7 |
| Osteoporosis | 75 | 31.9 |
| Foot problems | 72 | 30.6 |
| Diabetes mellitus (DM) | 64 | 27.2 |
| Urinary incontinence (UI) | 59 | 25.1 |
| Coronary artery diseases (CAD) | 51 | 21.7 |
| Nutritional problems | 42 | 17.9 |
| Previous cerebro-vascular accident | 37 | 15.7 |
| Hypotension/ vertigo | 35 | 14.9 |
| Tremors | 16 | 6.8 |
| Hearing problems | 12 | 5.1 |
| Number of medication consumed: | | |
| One | 70 | 29.8 |
| Two | 74 | 31.5 |
| Three | 55 | 23.4 |
| ≥ Four | 36 | 15.3 |
| Type of medications consumed lead to falls:# | | |
| Analgesics and anti-inflammatory | 95 | 40.4 |
| Diuretics | 72 | 30.6 |
| Anticoagulants | 50 | 21.3 |
| Hypnotics and anxiolytics | 38 | 16.2 |
| Antihistaminic | 13 | 5.5 |
| Antidepressants & psychoactive drugs | 9 | 3.8 |
| Muscle relaxants | 8 | 3.4 |
| Others (antihypertensive, oral hypoglycemic, thyroxin, bronchodilator, cardiac drugs and antispasmodics) | 126 | 53.6 |
| Use of assisted aids | 128 | 54.5 |
| Types of used assisted aids:# | | |
| Eye glasses | 92 | 71.9 |
| Cane | 37 | 28.9 |
| Walker | 15 | 11.7 |
| Hearing aids | 12 | 9.4 |

More than one response was reported

Fall - related history of the studied group, as illustrated by table (4), shows that more than fifty percent (52.3%) fell twice during the previous year. Falls impacted seriously the life domains of 48.1% of the studied group. The most common related consequences were fractures (63.7%), different forms of disability (62.8%) and skin-integrity disturbance in the form of abrasions (32.7%), wounds (27.4%), and pressure ulcer (17.7%). Nearly a third (31.5%) admitted to the hospital as a reaction to fall experience and 70.3% of them hospital bounded from a week to month duration. Unfortunately, only 17.0% checked by health professionals regarding falls accidents during follow their medical conditions. 61.7% of the participants can occasionally (from time to time) limit fall occurrence and a more near percent (68.1%) didn't notify fall events to a health provider to obtain medical help. Those who didn't report fall incidence justified that fall considered normal to whom in their age (41.3%), fear to be restricted in institutions (33.8%), or felt embarrassed to report such event (25.0%). From all the studied group, only 38.3% obtained medical care when fall occur and 31.9% already relocated in different places as a consequence of fall. Near similar percent (74.5% and 72.8% respectively) either needed help to resume activities or experienced a degree of restriction in daily activities after falling with the all mentioned that dealing with fall-related effects went beyond their financial abilities.

Table (4): Fall-related history of the studied elderly community dwellers (n=235).

| Fall-related history of the elderly community dwellers | Frequency | Percent |
|--|------------------|----------------|
| Frequency of falls during the last year | | |
| Once | 53 | 22.6 |
| Twice | 123 | 52.3 |
| Three times or more | 59 | 25.1 |
| Serious impact of falls | 113 | 48.1 |
| Falls-related consequences(#) | | |
| Fractures | 72 | 63.7 |
| Disability | 71 | 62.8 |
| Abrasions | 37 | 32.7 |
| Wounds | 31 | 27.4 |
| Pressure ulcer | 20 | 17.7 |
| Admission to the hospital due to falls | 74 | 31.5 |
| Duration of hospitalization | | |
| Week – Month | 52 | 70.3 |
| >Month | 22 | 29.7 |
| Checked by health professionals about fall incidence during follow up of medical conditions | | |
| No | 195 | 83.0 |
| Yes | 40 | 17.0 |
| Number of times that the older adults can control himself to avoid falls | | |
| Sometimes | 145 | 61.7 |
| Mostly | 66 | 28.1 |
| Always | 24 | 10.2 |
| Notification of fall incidence when occur to a health care provider | | |
| No | 160 | 68.1 |
| Reason of non-notification | | |
| Fall is a normal consequence of being old | 66 | 41.3 |
| Fear of admission to nursing homes/hospitals or others | 54 | 33.8 |
| Embarrassment | 40 | 25.0 |
| Obtaining Medical care if fall occur | 90 | 38.3 |
| Need of help to resume activities after falling | 175 | 74.5 |
| Restriction of daily activities due to falling | 171 | 72.8 |
| Relocation because of fall | 75 | 31.9 |
| Adequacy of income to manage the fall –related effects | | |
| No | 235 | 100.0 |

More than one response was reported.

Table (5) mentions the most frequently practiced actions by the participants leading to falls and measures followed toward the prevention or management. Less consumption of calcium - rich food (78.7%), lack precautions in bath room (75.7%), walking barefoot and use detergent in cleaning (both 74.5% equal), and being less active during daily activity or never exercised (71.5%) are among the top reported fall-related behaviors. More behaviors were also identified by a significant percent of participants such as less considered using night light (69.4%), and consumption of lots of caffeine (65.1%). Regarding preventive measures participants used, all of them avoided situations disrupted their balance. Keeping needed things in hands were reported by 82.1 percentages. Similarly, reporting unusual complains or complications and avoid rushing (78.7% for both) followed as an avoidance behavior of falls. Those who followed prescribed medication

schedule (73.2%) or prevented over the counter medication (72.8%) and managed chronic diseases (71.1%) were also relevant.

Table (5): Falls-related behaviors of the studied elderly community dwellers and measures followed to manage/control/prevent falling situations (n= 235).

| Falls-related behaviors of the studied elderly community dwellers and measures followed to manage/control/prevent falling situations | Frequency | Percent |
|--|-----------|---------|
| Behaviors reported by the studied elderly community dwellers predispose them to falls: (#) | | |
| • Low-served food rich in calcium | 185 | 78.7 |
| • Not considering of safety precautions during the bath room visit | 178 | 75.7 |
| • Walking barefoot | 175 | 74.5 |
| • Use detergent in cleaning | 175 | 74.5 |
| • Have low daily activity level/ or never practice any type of exercise | 168 | 71.5 |
| • Don't use any source of night light | 163 | 69.4 |
| • Consumed high amount of caffeine | 153 | 65.1 |
| • Left scattered objects on the floor | 90 | 38.3 |
| Methods followed by the studied elderly community dwellers to prevent falls: (#) | | |
| • Avoidance of any imbalance- related risk behaviors | 235 | 100.0 |
| • Keep frequently used things reachable | 193 | 82.1 |
| • Reporting any developed complains/ complications | 185 | 78.7 |
| • Keep away from rushing to do things | 185 | 78.7 |
| • Follow doctors' medication prescriptions | 172 | 73.2 |
| • Avoid over the counter medications | 171 | 72.8 |
| • Manage chronic diseases | 167 | 71.1 |
| • Independent in performing the activity of daily living | 152 | 64.7 |
| • Follow healthy diet | 134 | 57.0 |
| • Promote safe environment as possible | 131 | 55.7 |
| • Use of assistive devices | 128 | 54.5 |
| • Being socially active | 113 | 48.1 |
| • Follow periodic physical examinations | 90 | 38.3 |

More than one response was reported

Section II. Psychological factors concerning recurrent falls among the studied elderly community dwellers

The description of mean percent scores of the psychological factors (activity restriction due to fear of falling, perceived consequences of falling, and depressive symptomatology) predisposing the studied participants to recurrent falls, according to table (6), signifies that a relatively half of the community residents restricted their activity in a certain degree as a consequence of fear of falling (mean% score= 45.86%). More than half of them perceived that falls events consequently affected them (mean percent score= 56.39%) with nearly equal mean percent scores of its sub-dimensions: damage to identity (a mean of 55.44±18.15) and loss of functional independence (a mean of 57.35±17.69). Depressive symptomatology (covered somatic, affective and psychological symptoms) was prevalent among less than two thirds of the residents with a mean % ± SD= 62.43±6.75 which stated as the most contributing psychological risk factor of recurrent falls, with overall psychological disturbances reported by 52.78%.

Table (6): Levels of activity restriction due to fear of falling, perceived consequences of falling, and depressive symptomatology of the studied elderly community dwellers (n = 235)

| Psychological factors contributing to recurrent falls among the studied elderly community dwellers | Min. – Max. | Mean ± SD. (%) |
|--|---------------------|----------------------|
| 1. Levels of activity restriction due to fear of falling | 2.94 – 91.18 | 45.86±21.34 |
| 2. Perceived consequences of falling | 11.11 – 83.33 | 56.39±16.50 |
| • Damage to Identity (DI) | 5.56 – 83.33 | 55.44±18.15 |
| • Loss of Functional Independence (FI) | 5.56 – 88.89 | 57.35±17.69 |
| 3. Depressive symptomatology | 50.0 – 85.0 | 62.43±6.75 |
| Overall Psychological Disturbances | 20.02 – 77.4 | 52.78 ± 14.75 |

Section III. Behavioral factors protecting against recurrent falls among the studied elderly community dwellers

Considering day-to-day behavioral patterns, actions and habits of the elderly community dwellers that concerning recurrent falls, table (7) lists that overall mean percent score of behaviors' domains practiced by the studied elderly community dwellers against falling was 53.42±13.66. On assessing the domains, the highest mean percent fall- protected behavioral and habitual patterns score was observed among those behaviors concerning displacing activities (80.71±24.20), getting to phone (70.78±29.51) and pace (70.28±25.18). This is compared to the lowest mean percent practice score of 39.36±19.50, 41.38±14.78, and 47.66±15.96 respectively which denoted that being observant for particular hazards, practical strategies, and awareness were the least behavioral protective manners used by the elderly community residents. Meaning that, lacking in the practice of these domains are the main risk behavioral factors contributing to falls.

Table (7): Different domains of protecting behaviors practiced by the studied elderly community dwellers against falling (n = 235)

| Different domains of protecting behaviors practiced by the studied elderly community dwellers against falling | Min. – Max. | Mean ± SD. (%) |
|--|----------------------|--------------------|
| Displacing activities | 0.0 – 100.0 | 80.71±24.20 |
| Getting to the phone | 0.0 – 100.0 | 70.78±29.51 |
| Pace | 0.0 – 100.0 | 70.28±25.18 |
| Changes in level | 0.0 – 100.0 | 55.89±24.98 |
| Avoidance | 16.67 – 88.89 | 55.11±16.11 |
| Protective mobility | 11.11 – 94.44 | 52.32±17.89 |
| Cognitive adaptations | 4.76 – 80.95 | 50.23±16.57 |
| Awareness | 0.0 – 88.89 | 47.66±15.96 |
| Practical strategies | 0.0 – 75.0 | 41.38±14.78 |
| Being observant for particular hazards | 0.0 – 100.0 | 39.36±19.50 |
| Overall mean percent score of behaviors' domains practiced by the studied elderly community residents against falling | 20.69 – 79.31 | 53.42±13.66 |

Section IV. Perceived ability to control and manage falls among the studied elderly community dwellers

Table (8) importantly reflects that perceived lacking ability to either manage or control fall-leading situations is the configuring picture among the elderly community residents (Only 28.80% and 32.31% respectively believed in their ability to manage and control falls which pointed out of a poor level of perception in general).

Table (8): Mean percent scores of the studied elderly community dwellers' perceived ability to control and manage Fall.

| Perceived ability to control and manage falls among the studied elderly community dwellers | Min. – Max. | Mean ± SD. (%) |
|--|-------------|----------------|
| Perceived ability to control falls | 0.0 – 100.0 | 32.31±18.35 |
| Perceived ability to manage falls | 0.0 – 75.0 | 28.80±15.72 |

Table (9) clarifies the relationship between general characteristics of the elderly resided in the community; and their fall-related protective behaviors and perception toward the ability of controlling and managing falls. Differences of mean scores of the previously mentioned items in relation to some general characteristics especially age, were statistically significant at $p < 0.001$ using student t-test and ANOVA test.

Table (9):Relation between the studied elderly community dwellers’ protecting behaviors to prevent falls, their perceived ability to control falls and their perceived ability to manage falls and socio-demographic data (n = 235)

| Variables | N | The behaviors of older adults to protect against falls | | Test of Sig. | P | perceived ability to control falls | | Test of Sig. | P | perceived ability to manage falls | | Test of Sig. | P |
|----------------------------------|-----|--|---------------|--------------|---------|------------------------------------|-------------|--------------|---------|-----------------------------------|-------------|--------------|---------|
| | | Min. - Max. | SD±Mean | | | Min. - Max. | SD±Mean | | | Min. - Max. | SD±Mean | | |
| Gender | | | | | | | | | | | | | |
| Male | 148 | 20.69 – 73.56 | 50.25 ± 13.01 | t=4.867* | <0.001* | 0.0 – 100.0 | 19.20±32.52 | t = 0.221 | 0.825 | 0.0 – 75.0 | 15.65±29.27 | t = 0.587 | 0.558 |
| Female | 87 | 22.22 – 79.31 | 58.82 ± 13.10 | | | 6.25 – 68.75 | 16.90±31.97 | | | 6.25 – 75.0 | 15.89±28.02 | | |
| Age (years) | | | | | | | | | | | | | |
| 60 – 70 | 147 | 20.69 – 72.41 | 46.80 ± 12.12 | t = 13.763* | <0.001* | 0.0 – 100.0 | 19.42±36.86 | t = 5.660* | <0.001* | 0.0 – 75.0 | 17.52±31.38 | t = 3.703* | <0.001* |
| 70> | 88 | 42.53 – 79.31 | 64.49 ± 7.58 | | | 0.0 – 50.0 | 13.40±24.72 | | | 6.25 – 50.0 | 10.94±24.50 | | |
| Educational Level | | | | | | | | | | | | | |
| Illiterate + reading and writing | 115 | 22.99 – 74.71 | 53.0 ± 12.99 | F=0.777 | 0.508 | 6.25 – 100.0 | 18.51±32.45 | F = 0.524 | 0.666 | 6.25 – 62.50 | 14.86±27.93 | F = 0.491 | 0.689 |
| Essential education | 65 | 20.69 – 78.16 | 52.20 ± 15.29 | | | 6.25 – 81.25 | 18.62±34.04 | | | 0.0 – 75.0 | 16.40±30.77 | | |
| Secondary education | 38 | 24.14 – 75.86 | 56.13 ± 12.92 | | | 6.25 – 68.75 | 18.20±30.59 | | | 6.25 – 75.0 | 16.16±27.96 | | |
| University + High studies | 17 | 31.03 – 79.31 | 54.93 ± 13.33 | | | 0.0 – 56.25 | 17.27±28.68 | | | 6.25 – 75.0 | 18.35±29.04 | | |
| Pre-retirement occupation | | | | | | | | | | | | | |
| Worker | 68 | 20.69 – 73.56 | 48.78 ± 13.14 | F = 8.603* | <0.001* | 6.25 – 75.0 | 18.80±35.66 | F = 1.671 | 0.174 | 0.0 – 68.75 | 16.06±29.32 | F = 0.180 | 0.910 |
| Wife House | 51 | 23.46 – 78.16 | 60.06 ± 12.67 | | | 6.25 – 68.75 | 14.94±29.04 | | | 6.25 – 75.0 | 14.86±27.70 | | |
| Employee | 55 | 24.14 – 79.31 | 55.76 ± 12.94 | | | 0.0 – 68.75 | 17.78±30.0 | | | 6.25 – 75.0 | 16.70±28.30 | | |
| Free Working | 61 | 22.99 – 73.56 | 50.95 ± 13.32 | | | 6.25 – 100.0 | 20.50±33.40 | | | 6.25 – 62.50 | 15.43±29.61 | | |

t: Student t-test
 F: F for ANOVA test
 p: p value for comparing between the different categories
 *: Statistically significant at p ≤ 0.05

In addition to the significant correlations, table (10) notes that elderly community dwellers consumed 4 types of medications or more, used assisted aids, and previously fell three times or more during the last year exhibited an observed statistical significant correlation with the behaviors of older adults to be protected against falls and their perceived ability to control falls at p ranged from ≤ 0.05 - <0.001

Table(10):Relation between the studied elderly community dwellers’ protective behaviors to prevent falls, their perceived ability to control falls and their perceived ability to manage falls and their clinical data (n = 235).

| Variables | N | The behaviors of older adults to be protected against falls | | Test of Sig. | P | perceived ability to control falls | | Test of Sig. | P | perceived ability to manage falls | | Test of Sig. | P |
|---|-----|---|---------------|--------------|---------|------------------------------------|---------------|--------------|---------|-----------------------------------|---------------|--------------|--------|
| | | Min. - Max. | Mean ± SD. | | | Min. - Max. | Mean ± SD. | | | Min. - Max. | Mean ± SD. | | |
| Number of medication consumed | | | | | | | | | | | | | |
| 1 type of medication | 70 | 20.69 – 72.41 | 46.55 ± 12.94 | F = 12.086* | <0.001* | 0.0 – 100.0 | 37.95 ± 20.91 | F = 5.001* | 0.002* | 6.25 – 75.0 | 32.05 ± 17.06 | F = 1.828 | 0.143 |
| 2 types of medications | 74 | 22.22 – 75.86 | 53.35 ± 12.74 | | | 0.0 – 75.0 | 33.11 ± 16.77 | | | 0.0 – 75.0 | 27.79 ± 16.56 | | |
| 3 types of medications | 55 | 29.89 – 79.31 | 59.03 ± 12.87 | | | 6.25 – 81.25 | 25.91 ± 15.33 | | | 6.25 – 75.0 | 28.52 ± 14.42 | | |
| ≥ 4 types of medications | 36 | 25.29 – 76.54 | 58.38 ± 12.42 | | | 6.25 – 87.50 | 29.51 ± 17.40 | | | 6.25 – 62.50 | 25.0 ± 12.14 | | |
| Use of assisted aids | | | | | | | | | | | | | |
| No | 107 | 22.99 – 75.86 | 51.49 ± 13.05 | t = 1.996* | 0.047* | 0.0 – 100.0 | 34.64 ± 18.74 | t = 1.783 | 0.076 | 6.25 – 75.0 | 29.03 ± 15.79 | t = 0.202 | 0.840 |
| Yes | 128 | 20.69 – 79.31 | 55.04 ± 14.0 | | | 6.25 – 87.50 | 30.37 ± 17.86 | | | 0.0 – 75.0 | 28.61 ± 15.72 | | |
| Number of falls during the last year | | | | | | | | | | | | | |
| Once | 53 | 20.69 – 72.41 | 42.53 ± 13.79 | F = 26.583* | <0.001* | 0.0 – 100.0 | 41.51 ± 23.26 | F = 9.995* | <0.001* | 0.0 – 75.0 | 34.67 ± 18.53 | F = 4.957* | 0.008* |
| Twice | 123 | 22.99 – 78.16 | 56.37 ± 11.80 | | | 0.0 – 68.75 | 30.74 ± 15.57 | | | 6.25 – 75.0 | 27.29 ± 14.28 | | |
| ≥ Three times | 59 | 25.29 – 79.31 | 57.06 ± 12.21 | | | 6.25 – 87.50 | 27.33 ± 15.99 | | | 6.25 – 75.0 | 26.69 ± 14.81 | | |

t: Student t-test
 F: F for ANOVA test
 p: p value for comparing between the different categories
 *: Statistically significant at p ≤ 0.05

Answering the main current research question, Table (11) portrays an inverse relationship between behavioral protecting and psychological predisposing factors of recurrent falls among the elderly community dwellers and their perceived ability to both control and manage falls incidents. This inverse relation is statistically significant at p ranged from ≤ 0.05 - <0.001 using Pearson coefficient. Interestingly, as the practice of actions and habitual/intentional protective behaviors increased, the residents' beliefs in their capabilities toward managing and controlling falls decreased. In addition, as the psychological fall- related risk factors intensified (i.e. more disturbed psychological status), the residents' internal faith in their abilities of managing and controlling falls worsened and lowered.

Table (11): Correlation between behavioral and psychological fall-related factors and perceived ability to control and manage falls among the studied elderly community dwellers (n = 235)

| Behavioral and psychological fall-related factors | Perceived ability to control falls | | Perceived ability to manage falls | |
|---|------------------------------------|---------|-----------------------------------|---------|
| | r | P | r | P |
| The behavioral fall-related protecting/preventive factors | | | | |
| Displacing activities | -0.290* | <0.001* | -0.267* | <0.001* |
| Getting to the phone | -0.232* | <0.001* | -0.251* | <0.001* |
| Pace | -0.322* | <0.001* | -0.303* | <0.001* |
| Changes in level | -0.174* | 0.008* | -0.122 | 0.062 |
| Avoidance | -0.392* | <0.001* | -0.345* | <0.001* |
| Protective mobility | -0.439* | <0.001* | -0.389* | <0.001* |
| Cognitive adaptations | -0.521* | <0.001* | -0.289* | <0.001* |
| Awareness | -0.341* | <0.001* | -0.326* | <0.001* |
| Practical strategies | -0.431* | <0.001* | -0.295* | <0.001* |
| Being observant for particular hazards | -0.330* | <0.001* | -0.212* | 0.001* |
| Overall behavioral domains practiced by the studied elderly community dwellers against falling | -0.532* | <0.001* | -0.412* | <0.001* |
| The psychological fall- related risk factors | | | | |
| - levels of activity restriction due to fear of falling | -0.522* | <0.001* | -0.382* | <0.001* |
| - Perceived consequences of falling | -0.600* | <0.001* | -0.482* | <0.001* |
| • Damage to Identity | -0.567* | <0.001* | -0.462* | <0.001* |
| • Loss of Functional Independence | -0.537* | <0.001* | -0.425* | <0.001* |
| - Depressive symptomatology | -0.586* | <0.001* | -0.459* | <0.001* |
| Overall Psychological Disturbances among elderly community dwellers | -0.611* | <0.001* | -0.471* | <0.001* |

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

IV. Discussion

The number of older adults increased as a reality throughout the world including Egypt ⁽²⁶⁾. In a consequence, a pronounced number of older adults will trigger substantial raise in falls prevalence at an alarming rate ⁽²⁷⁾. According to the Centre for Disease Control and Prevention (2017), one in four elderly community dwellers over 65 years of age fall each year ⁽²⁸⁾. Falls are associated with increased morbidity and even mortality and falls- related injuries exponentially increased which corrupt elders' autonomy, independence and quality of life ⁽²⁹⁾. Report about falls in the United States (2018) revealed that death from unintentional injuries is the seventh leading cause of death among older adults, and falls account for the largest percentage of those deaths ⁽³⁰⁾. The overall rate of older adult death from falls increased 31% from 2007 to 2016 (3.0% per year) ⁽³⁰⁾. Given these considerations, there is a growing concern toward the multi-interrelated behavioural and psychological risk factors which exacerbated with age-related biological changes.

Assessment of these above-mentioned factors concerning recurrent fall risk have been highly prioritized as well as the biological and environmental factors, thus it helps health professionals, elders, and their caregivers to target those at highest risk and consequently prevent the occurrence of falls ⁽³¹⁾. Primarily, the present research gave a suggestion that several factors worked together to establish the risk of recurrent falls among elderly community dwellers. Among the primarily factor searched in this study is the elders' everyday behavioural dealing with their surroundings. The adding in this research goes beyond the traditional factors to more explore and emphasize on actions elders' perform during every smallest aspects of life for possible future preventive methods of recurrent falls in those with a previous history, through identification of both the fall risky-related behavioural factors to change them and fall preventive- related behavioural factors to enforce their

practice till the stage of being normative habitual behaviours. Moorhead et al., (2008) ⁽³²⁾ defined fall preventive behaviours as “the personal or family caregiver actions to minimize risk factors that might precipitate falls in the personal environment”. As revealed by the present study findings, the overall mean percent score of the protective behavioural domains practiced by the studied elderly community dwellers against falling was 53.42% that considered lower among individuals with a medium to high risk of falls and experienced previous fall-related history. Lower rate may be back to the elders’ point of view as 41.3 % of the studied elders considered fall as a normal aging consequence that should be accepted as an outcome of associated frailty so no actions made it reversed or managed, feared to be stereotyped by people in the community when observing their cautions making them embarrassed (33.8%) as 68.1% of the studied elders avoid reporting fall incidence to health care providers and only 38.3% received medical help when fall occurred, which increased the magnitude of the problem. In the same line, Stevens et al., (2010) ⁽³³⁾ reported that fatalism, denial of risk, poor self-efficacy as barriers for adopting fall interventions.

The decrement due to age and illness increases the risk of falling. The National Council on Aging (2018), reported that 80% of older adults have at least one chronic disease, and nearly 70% have two or more ⁽³⁴⁾. Similarly the results of our study proved the relevance between chronic illnesses and repeated incidence of falls. Among the diseases and common geriatric syndromes leading to fall experienced by the current studied residents, osteoarthritis stated in the frontal line of the problems. The Centers for Disease Control and Prevention (2014) reported that older adults with physician-diagnosed arthritis were twice more likely to have two or more falls than those without arthritis, and had an increased risk for fall-related injuries ⁽³⁵⁾. It is clear that osteoarthritis creates a tremendous strain on the elderly by more days of restricted activity. Muraki, et al. (2011) ⁽³⁶⁾, and Hoops et al. (2012) ⁽³⁷⁾ reported that stressors of osteoarthritis such as pain, limitation, and dependence may have a negative impact on elder's wellbeing, leaved the elder feeling overwhelmed in general, reduced physical and mental functioning, increased fatigue and isolation from social activities, and difficulties with carrying out activities of daily livings which predispose to physical inactivity that leading to future falls. Elderly females more frequently experiencing osteoarthritis than men do ⁽³⁸⁾, as so, it is seems reasonable to find the elderly females in this study finding had a higher protective behavioral actions against falls comparing to their males counter partner with a significant differences in the mean scores.

In the present study, the most contributing fall- protected behavioural and habitual patterns observed were, those behaviours concerning displacing activities, getting to phone, and pacing. While, being observant for particular hazards and practical strategies were the most risk-related behavioural factors as rated by the lower score of all protective behavioural domains. The differences in older adults’ performance of certain fall preventive behaviours than other in different dimensions may be influenced by multiple factors. Ounlamai (2010)⁽³⁹⁾. suggested that knowledge of fall prevention and risk factors, perceived severity of falls, difficulty in practice of fall preventive behaviours, self-efficacy in fall prevention, degree of elders’ valuing of and motivation toward fall protection, in addition to their attitude toward falls prevention were among the most significant predictors. It was expected to find elders’ higher mean score of behavioural domains refer to displacing activities in the current study. By other words, the studied participants select safer situation or any situation away from those expected to lead to fall, this mean that they avoid any imbalance-related situations or behaviours as a first method for fall prevention. Elders in the present study had lowered functional ambulation due to gait disturbances (35.7%), osteoporosis (31.9%), and foot problems (30.6%). These endogenous problems, if combined, with extrinsic risky situations expose the elders to falls; so more precautions from elder's side regarding these activities were extensively implemented. Moreover, 82.1% of elders kept frequently used things reachable so it is usual to carefully practice getting to or reaching for things such as phone which obtain the second higher scores of all behavioural domains.

Maki and McIlroy (2005) ⁽⁴⁰⁾ reported that balancing reactions that involve rapidly taking a step or reaching to grasp an object for support play a critical role in preventing falls, but the ability to execute these reactions effectively can be impaired even in relatively young and healthy seniors. In the same direction, the present study reported pace or avoidance of hurrying in doing things ranked as the third protective action. The researchers returned this result to age-related changes in the neural, sensory and musculoskeletal systems that may lead to impaired ability to react to a sudden loss of balance. Add to that, 31.5% of the studied elders consume two types of medications while 23.4% followed a prescription of three, meaning more adverse reactions can be expected. Analgesics and anti-inflammatory in addition to diuretics were the headings of medication consumption by 40.4% and 30.6% respectively, which often produce dizziness that encompasses a spectrum of balance-related symptoms in which the person improperly experiments the perception of motion ⁽⁴¹⁾.

Elderly community residents scored lowest for observation of particular hazard which are behaviours associated with being vigilant in looking out for certain hazards. A significant percent of the current studied elders (39.1%) complained of ophthalmological problems reducing the patient ability in noticing hazards even they wore eye glasses as an aid. This condition stated as the main correlated risk factor of falls in Qin et al. study (2009) ⁽⁴²⁾ among senior visiting elderly centres in Macao. Diabetes mellitus was prevalent among 27.2%

producing peripheral neuropathy making difficult to those patients to identifying hazards. Sensory-perceptual deprivations in addition to increase pain threshold can slowed the reaction of elders to existed hazards. Practical strategies which present the anticipation of hazards or planning to prevent it were the secondary lower. Promoting safe environment and safety precaution highlighted this domain which seemingly insufficient among the studied group. 75.7% of them didn't consider any safety measures during the use of bathroom and just 55.7% keep their environment safe.

The elderly faith in their competence to perform behaviours or activities to achieve fall control or prevention, how they use their environment as well as their desire to make any changes usually termed as perceived ability to manage falls. So it is predicted that as protected behaviors increased, the perception of control elevated. Surprisingly, the study finding revealed that older adults who had lower perceived fall self-control and management largely engage in behaviours to prevent falls with a statistical inverse relationship between the two constructs. Health Belief Model provided an explanation to this unexpected result. Investigating fall preventive behaviours assumes that the more fear or risk older adults perceives, the more likely they are to engage in a behaviour, that could not necessarily enough for elders to possess the perceived ability to manage.⁽⁴²⁾ Elderly makes adaptations with falls for the purpose of gain compensation and coping with this most delirious event, wishing to not experience previous memories of prolonged days of suffering post-fall. Even though, their internal feeling still believe in their disabilities in role they could play in controlling. Examples of bad experiences with falls were hospital admission which reported by 31.5% of the current studied elders, of whom 70.3% revealed a duration of a week to month in hospitals. By answering the first research question, it is essential that most fall prevention programs in Egypt to be tailored to each elder whereas the protective fall behaviour to be supported and risk taking behaviour to be modified.

The current study also determined three basic fall-caused psychological disturbances. Those constructs are connected to the degree of great attribution to each other, meaning that the presence of these risk factors can create a downward spiral of events by triggering a fall, more intense fear of falling and low falling control ability, activity restriction, and high level of depression. In exploring the whole picture, the current studied community-living older adults acknowledged the experience of psychological difficulties as a result of fall by 52.78 % of their totality. Evidences pointed out that between 29% and 77% of older adults resided in the community experienced this difficulty^(43,44). What we can say that, even with the absence of physical harm, the squealed falls can produce psychological matters that may be worse than fall itself. Falls commonly bring depressive reaction with three possibilities. It sometimes precedes falls, falls come first, or both resulted from another factors such as disabilities. Older people who fall are twice as likely to be depressed compared to those who do not fall⁽⁴⁵⁾. Depressive symptomatology (62.43%) was the primary detected factor referred to impaired psychological status in the present study. It is not a strange finding; however it is supported by the prevalence of disabilities among 62.8% of current studied elders which mostly caused fall-related depression. Although the primary contributor to fall, depression in old age often underestimated and escape detected which making depression passed unnoticed and untreated. Depression in older adults may be difficult to recognize due to its asymptomatic and multifactorial nature. Many depressed seniors may not feel sad at all, instead, they may complain of low motivation, a lack of energy, or physical problems⁽⁴⁶⁾. In line with this fact, the present study revealed a low consumption of antipsychotics (3.8%) among the present studied elders despite of great prevalence of depressive symptomatology.

Both fear of falling and depression are independently related to stride-to-stride variability, which itself a marker of falls risk⁽⁴⁷⁾. It is also possible that falls may lead to depression (reverse causality) by reducing functional status and increasing disability⁽⁴⁸⁾. Falls can also result in fear of falling, which may in turn lead to depressive symptoms. Older people's perception is one of the psychological factors contributing to recurrent fall risk and greatly influences their behaviour, so it should be seriously assessed. More than half of elders in the present study perceived that fall events consequently affected them (56.39%) by damage their identity (55.44%) and loss their functional independence (57.35%). Falls damage the identity through lowering self-esteem, creating internal hesitance, and losing confidence in self. Further, becoming embarrassed, having physical discomfort from pain, and feeling helpless exacerbate of being less supported which impaired both identity and dependence. In the same direction, Yardley and Smith (2002)⁽²¹⁾ concluded that loss of functional independence and damage to identity were the commonly feared consequences of falling, and these fears were correlated with avoidance of activity. Loss of functional independence often resulted from inability to cope with the stressful events; disability and subsequent traumatic injury. Fracture rated as the basic impact of falls by 63.7% in this study. Fracture seriously affected physical and mental functioning and exerted a severe impact on older adults' health statues and functional independence. This result came in line with Alexiou et al.; (2018)⁽⁴⁹⁾ who concluded that hip fracture seriously affected physical and mental functioning and large number of patients in his study did not return to the pre-fracture level of performance. Also, in relation with the previous point, it is worth mentioning that a low rich calcium diet should become alarm for recurrent fallers, 78.7% of the current studied elders reported low-served food rich in calcium. Undoubtedly, this point must be considered, as

deficiency in calcium and vitamin D increased risk of falls and produced poor fall recovery, which in turn affect the older adults' functional independence as mentioned ^(50, 51).

Fear of falling (FOF) is ranked as the third psychological risk factor for recurrent falls in the present study; however it is the most important part of the problem that can threaten the older adult autonomy. Tinetti & Powell (1993) ⁽⁵²⁾ defined FOF as "lasting concern about falling that leads an individual to avoid activities that he/she remains capable of performing". FOF can range from a healthy concern about avoiding risky situations to a more severe and disabling form of anxious feeling which can negatively affect an older adult's independence. Again, the problem is not in fearing but the reverse outcome it produced. Becoming feared had a dual effect. If perceived positively, the elderly gain initiation toward taking active behavioural precautions against falls, which subsequently lead to gait adaptations that increase stability, balance and reduced recurrent fall rate. From the other face, fearing sensations decline the activities needed to promote independence and self-confidence. According to this school of thought, the current study revealed that 45.86% restricted their activity secondary to falls-producing fearful feelings.

From here, restrictions can produce maladaptive changes in balance control that may increase the risk of a new fall. Therefore, being fearful of falling create a reduced efficacy in ability to prevent, control or manage falls, which consequently lead to more future fall events. In the severe form, a more pronounced fear translated into increased activity restriction, reduced social interaction, depressed mood, poor functional mobility; and ultimately, a sedentary lifestyle. The work of Scheffer et al., (2008) ⁽⁵³⁾ and Lach and Parsons (2013) ⁽⁵⁴⁾ revealed that FOF can directly or indirectly compromised both mobility and quality of life in older adults resided in the community and in nursing homes, through activity restriction and avoidance. The study of Van Haastregt et al., (2008) ⁽⁵⁵⁾, in addition revealed that the degree of fear of falling has been associated with the intensity of depression and anxiety as well as with self-efficacy. This explained clearly in our study by the statistically significant negative relationship found between different parameters of the psychological status and their ability regarding fall management. Those who are fearful of falling expected to develop lacking confidence in their ability to prevent or manage falls as a natural consequence, which increases the risk of unlimited falls. The researcher returned this result to that the elders who are fearful, previously fallen, using assistive devices, having some depressive symptoms, having chronic diseases, with polypharmacy and have some degree of restriction in daily activities in addition to leave their home to another place (relocated); tend to have lack of self-efficacy and low confidence in their ability to control and manage falls. In the same direction, report on senior's fall in Canada (2005) ⁽⁵⁶⁾ reported that people who are fearful of falling tend to lack confidence in their ability to prevent or manage falls properly, which in turn increased the risk of falling again.

By the development of a clear understanding of the behavioral and psychological-related fall risk and its relation to fall control, this research can add to nursing science by help the gerontological nurses to do the best actions by formulate more effective means of prevention and treatment that enhance fall management behaviors in the Egyptian older adults.

V. Conclusion

The most contributing fall-protected behavioral and habitual patterns among the studied elderly community dwellers were observed among those behaviors concerning displacing activities. While, being observant for particular hazards was the most risk-related behavioral factors. Depressive symptomatology stated as the most influence psychological risk factors for recurrent falls compared with the other assessed factors in this category. Perceived lacking ability to either manage or control fall-leading situations was the configuring picture among a significant percent. There is an inverse relationship between behavioral protecting and psychological predisposing factors of recurrent falls among the elderly community dwellers and their perceived ability to both control and manage falls incidents. With the increased practice of habitual/intentional protective behaviors, the residents' beliefs in their capabilities toward managing and controlling falls decreased. In addition, the more disturbed psychological status, the lowered the residents' internal faith in their abilities of falls management. Statistical significant relations were proved between behaviors factors and fall management; and the elderly some general characteristics (especially age) and clinical fall-related data.

VI. Recommendations

1. Clinical assessment is essentially to include screening of behavioral and psychological factors besides other physical and environmental factors. Multifactorial and multidisciplinary risk assessments have to be extended to those resided in acute settings (hospitals) or assisted living facilities.
2. More attention should be paid to seniors with sensory impairment, advanced age or frail, impaired health status, disturbed mobility issues, balance deficits, medications, cognitively impaired, continence problems, syncope, and recurrent fallers.
3. Implementation of multifactorial management is crucial for elders at a medium to high risk of falls or repeated falling and should include balance, muscle strengthening and gait training, assessment of the

presence of hazards within the home and intervene safety measure accordingly, ophthalmological assessment and referral, supplementation of vitamin D, managing foot problems and footwear, provide management to syncope and postural hypotension, and medication modification with appropriate review especially among psychoactive drugs.

4. Encourage the elderly community dwellers to actively participate in fall prevention programs based on their individual needs which encourage activity and behavioral changes, promoting functional independence, provide emotional care and support, and address barriers such as fear of falling or less perceived ability to manage falling events (i.e. low self-efficacy). The contribution of formal and informal caregivers (if present) in these programs is an important starting point toward elders' compliance with the program, and whom apply preventive measure in case of disabled elderly.
5. Distribution of printed colored educational booklets and handouts full of illustrative pictures to elderly aimed at improve their involvement and mastering control over the commonly fall-associated intrinsic and extrinsic factors.
6. In-service training program about fall assessment, management and prevention should be constructed to nurses and all personals dealt directly or indirectly (ex. social worker or health care aids) with elderly in all settings.

Acknowledgment

A special word of gratitude is directed to the administrators of the study settings and the head of the outpatient clinics for their endless facilitations, support and professional relationship they provided during the completion of data collection. All my great thanks and sincere appreciation are extendedly directed to the elderly community dwellers for their cooperation and help to fulfill this work.

References

- [1]. Who.int [Internet]. Copyright World Health Organization (WHO); c2012 [Updated: 2012 October; Cited: 2014 Jul 9]. Available from: <http://www.who.int/mediacentre/factsheets/fs344/en/>.
- [2]. Kamel MH, Abdulmajeed AA, Ismail SE. Risk factors of falls among elderly living in Urban Suez - Egypt. *Pan Afr Med J*. 2013; 14:26.
- [3]. Yu PL, Qin ZH, Shi J, Zhanq J, Xin MZ, Wu ZL, et al. Prevalence and related factors of falls among the elderly in an urban community of Beijing. *Biomed Environ Sci*. 2009; 22(3): 179-87.
- [4]. Stenhagen M, Ekström H, Nordell E, Elmstahl S. Falls in the general elderly population: a 3- and 6- year prospective study of risk factors using data from the longitudinal population study 'Good ageing in Skane'. *BMC Geriatrics*. 2013; 13(81).
- [5]. Bekibele CO, Gureje O. Fall incidence in a population of elderly persons in Nigeria. *Gerontology*. 2010; 56(3): 278-283.
- [6]. Chen MF, Lin CL, Tsai CT, Chu SF, Hung SL, Yen BJ, et al. Risk factors related to falling among the home-dwelling elderly in Taiwan: a systematic review. *Taiwan J Public Health*. 2013; 32(5): 403-423.
- [7]. WHO. World Health Organization Global report on falls prevention in older age. France: 2007.
- [8]. Cdc.gov [Internet]. Falls in nursing homes 2012. [Updated: 2015 June; Cited: 2014 Jul 9]. Available from: <http://www.cdc.gov/HomeandRecreationalSafety/Falls/nursing.html>.
- [9]. Mumcu-Boğa N, Özdelikara A, Ağaçdiken S. Determination of falling behaviour among geriatric patients in nursing home. *Gümüşhane University Journal of Health Sciences*. 2015; 4(3): 360-371.
- [10]. Clemson L, Cumming RG, Heard R. The development of an assessment to validate behavioral factors associated with falling. *Am J Occup Ther*. 2003; 57(4): 380-388.
- [11]. Demura S, Kasuga K, Sato S, Sato T, Shin S. Determination of persons at a high risk of falling in a population of healthy community-dwelling elderly Japanese. *Int J Gerontol*. 2013; 7(1): 13-16.
- [12]. Khater MS, Mousa SM. Predicting falls among Egyptian nursing home residents: a 1-year longitudinal study. *Journal of Clinical Gerontology & Geriatrics*. 2012; 3(2): 73-76.
- [13]. Brito TA, Coqueiro RS, Fernandes MH, Jesus CS. Determinants of falls in community-dwelling elderly: hierarchical analysis. *Public Health Nurs*. 2014; 31(4): 290-297.
- [14]. Chien MH, Guo HR. Nutritional status and falls in community-dwelling older people: a longitudinal study of a population-based random sample. *PLoS One*. 2014; 9(3): e91044. doi: 10.1371/journal.pone.0091044.
- [15]. Cahill S, Stancliffe RJ, Clemson L, Durvasula S. Reconstructing the fall: Individual, behavioural and contextual factors associated with falls in individuals with intellectual disability. *J Intellect Disabil Res*. 2014; 58(4): 321-32.
- [16]. Wu TY, Chie WC, Yang RS, Liu JP, Kuo KL, Wong WK, et al. Factors associated with falls among community-dwelling older people in Taiwan. *Ann Acad Med Singapore*. 2013; 42(7): 320-7.
- [17]. Bergland A. Fall risk factors in community-dwelling elderly people. *Norsk Epidemiologi*. 2012; 22(2): 151-64.
- [18]. Folstein J, Folstein S. Mini mental state: A practical method of grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research* 1975; 12 (3): 189-195.
- [19]. El Okl M. Prevalence of Alzheimer dementia and other causes of dementia in Egyptian elderly. Unpublished Master Thesis: Faculty of Medicine, Ain Shams University, 2002.
- [20]. Cwikel JG, Fried VA, Biderman A, Galinsky D. Validation of a fall-risk screening test, the Elderly Fall Screening Test (EFST), for community-dwelling elderly. *Disabil Rehabil*. 1988; 20(5): 161-67.
- [21]. Yardley L, Smith H. A prospective study of the relationship between feared consequences of falling and avoidance of activity in community-living older people. *The Gerontologist*. 2002; 42 (1): 17-23.
- [22]. Lachman ME, Howland J, Tennstedt S, Jette A, Assmann S, Peterson EW. Fear of falling and activity restriction: The survey of activities and fear of falling in the elderly (SAFE). *Journal of Gerontology: Psychological Sciences*. 1998; 53 (1), 43-50.
- [23]. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385-401.

- [24]. Mahfouz MI. impact of self-care program on osteoarthritis related stressors among residents of elderly homes. Unpublished doctorate dissertation, Faculty of Nursing; Alexandria University, 2010.
- [25]. Lawrence RH, Tennstedt SL, Kasten LE, Shih J, Howland J, Jette A. Intensity and correlates of fear of falling and hurting oneself in the next year: Baseline findings from a royal center fear of falling intervention. *Journal of Aging & Health*. 1998; 10 (3): 267-86.
- [26]. 2017 A Profile of Older Americans: by the Administration on Aging (AoA), Administration for Community Living, U.S. Department of Health and Human Services. Available at <https://www.acl.gov>
- [27]. Guirguis-Blake J, Michael Y, Perdue L, Coppola E, Beil T. Interventions to Prevent Falls in Older Adults Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2018; 319(16):1705-16 .
- [28]. Hyattsville. United States department of Health and Human Services, CDC, National Center for Health Statistics; 2017 .
- [29]. Palumbo P, Klenk J, Cattelan L, Bandinelli S, Ferrucci L, Rapp K, Chiari L, Rothenbacher D. Predictive Performance of a Fall Risk Assessment Tool for Community-Dwelling Older People (FRAT-up) in 4 European Cohorts. *Journal of the American Medical Directors Association* 2016; 17 (12), 1106-13.
- [30]. Burns E, Kakara R. Deaths from Falls Among Persons Aged ≥ 65 Years -United States, 2007–2016. *Morbidity and Mortality Weekly Report (MMWR)* 2018 : 67(18);509-14.
- [31]. Lusardi M, Fritz S, Middleton A, Allison L, Wingood M, Phillips E, Criss M, Verma S, Osborne J, Chui KK. Determining Risk of Falls in Community Dwelling Older Adults: A Systematic Review and Meta-analysis Using Posttest Probability. *J Geriatr Phys Ther*.2017;40(1):1-36.
- [32]. Moorhead S, Johnson M, Maas M, Swanson E. *Nursing outcomes classification (NOC)*. 4th ed. Louis: Mosby co., 2008: 346.
- [33]. Stevens J, Noonan R, Rubenstein L. Older Adult Fall Prevention: Perceptions, Beliefs, and Behaviors. *American Journal of Lifestyle Medicine* 2010 :4(1); 16-20.
- [34]. 2018Healthy Aging Fact Sheet. The national council on aging. Available at <https://www.ncoa.org/resources/fact-sheet-healthy-aging/>
- [35]. Barbour K, Stevens J, Helmick C, Luo Y, Murphy L, Hootman J, Theis K, Anderson L, Baker N, Sugerman D; Centers for Disease Control and Prevention (CDC). Falls and fall injuries among adults with arthritis--United States, 2012. *MMWR Morb Mortal Wkly Rep*. 2014; 63(17):379-83 .
- [36]. Muraki S, Akune T, Oka H, En-Yo Y, Yoshida M, Nakamura K, Kawaguchi H, Yoshimura N. Prevalence of falls and the association with knee osteoarthritis and lumbar spondylosis as well as knee and lower back pain in Japanese men and women. *Arthritis Care Res* 2011;63(10):1425-31.
- [37]. Hoops M, Rosenblatt N, Hurt C, Crenshaw J, Grabiner M. Does lower extremity osteoarthritis exacerbate risk factors for falls in older adults? *Women's Health* 2012;8(6):685-96.
- [38]. Blagojevic M, Jinks C, Jeffery A, Jordan K. Risk factors for onset of osteoarthritis of the knee in elderly adults: a systematic review and meta-analysis. *Osteoarthritis Cartilage*. 2010;18(1):24-33.
- [39]. Ounlamai, S. A study of the relationships between personal factors perceived benefits barriers and self-efficacy in fall prevention and fall preventive behaviours among the elderly living in a community. *Journal of Nursing Science & Health* 2010; 33 (2).
- [40]. Maki B, Mellroy W. Change-in-Support Balance Reactions in Older Persons: An Emerging Research Area of Clinical Importance .*NUEROL CLIN*.2005;23(3):751-83.
- [41]. Chimirri S, Aiello R, Mazzitello C, Mumoli L, Palleria C, Altomonte M, Citraro R, De Sarro G. Vertigo/dizziness as a Drugs' adverse reaction. *Journal of Pharmacology &Pharmacotherapeutics* 2013;4(1):104-9 .
- [42]. Qin G, Kun W, Keng L, Ha CM, Ka C, Man L. Elderly falls and their relationship to the falls behavioral (FaB) scale and other risk factors amongst people who visit elderly centres in Macao. *Journal of Macao Polytechnic Institute* 2009; 49-56.
- [43]. Kressig R, Wolf S, Sattin R, O'Grady M, Greenspan A, Curns A, Kutner M. Associations of demographic, functional, and behavioral characteristics with activity-related fear of falling among older adults transitioning to frailty. *J Am Geriatr Soc*. 2001; 49(11):1456-62.
- [44]. Murphy S, Dubin J, Gill T. The Development of Fear of Falling Among Community-Living Older Women: Predisposing Factors and Subsequent Fall Events. *The journals of gerontology Series A, Biological sciences and medical sciences* 2003; 58(10):943-7.
- [45]. Stel V, Smit J, Pluijm S, Lips P. Consequences of falling in older men and women and risk factors for health service use and functional decline. *Age Ageing* 2004; 33(1):58-65.
- [46]. Fiske A, Wetherell J, Gatz M. Depression in Older Adults. *Annual review of clinical psychology* 2009; 5:363-89.
- [47]. Herman T, Giladi N, Gurevich T, Hausdorff J. Gait instability and fractal dynamics of older adults with a "cautious" gait: why do certain older adults walk fearfully?. *Gait Posture* 2005; 21(2):178-85.
- [48]. Kerse N, Flicker L, Pfaff J, Draper B, Lautenschlager N , Sim M, Almeida O. Falls, Depression and Antidepressants in Later Life: A Large Primary Care Appraisal. *PLoS ONE* 2008; 3(6):2423.
- [49]. Alexiou K, Roushian A, Varitimidis S, Malizos K. Quality of life and psychological consequences in elderly patients after a hip fracture: a review. *ClinInterv Aging* 2018;13:143-50 .
- [50]. Annweiler C, Montero-Odasso M, Schott A, Berrut G, Fantino B, Beauchet O. Fall prevention and vitamin D in the elderly: an overview of the key role of the non-bone effects. *Journal of NeuroEngineering and Rehabilitation* 2010; 7:50 .
- [51]. Dionyssiotis Y. Analyzing the problem of falls among older people. *International Journal of General Medicine* 2012; 5:805-13 .
- [52]. Tinetti M, Powell L. Fear of falling and low self-efficacy: A cause of dependence in elderly persons. *Journal of Gerontology* 1993; 48, 35-8.
- [53]. Scheffer A, Schuurmans M, van Dijk N, van der Hooft T, de Rooij S. Fear of falling: measurement strategy, prevalence, risk factors and consequences among older persons. *Age Ageing* 2008; 37:19-24.
- [54]. Lach H, Parsons J. Impact of fear of falling in long termcare: an integrative review. *J Am Med Dir Assoc*. 2013; 14:573-7.
- [55]. Van Haastregt J, Zijlstra G, van Rossum E, van Eijk J, Kempen G. Feelings of anxiety and symptoms of depression in community-living older persons who avoid activity for fear of falling. *Am J Geriatr Psychiatry* 2008;16(3):186-93.
- [56]. Scott V, Pearce M, Pengelly C. Report on seniors' falls in Canada (2005) Ottawa (ON): Public Health Agency of Canada; 2005. Technical report: injury resulting from falls among Canadians age 65 and over on the analysis of data from the Canadian Community Health Survey. Available at: <http://www.phac-aspc.gc.ca/seniors-aines/publications/pro/injury-blessure/falls-chutes/tech/injury-blessures-eng.php> .

Dr. Marwa Ibrahim Mahfouz Khalil "Behavioral and psychological assessment of recurrent fall risk and the correlates to perceived ability of fall management among Community-dwelling older adults" *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* , vol. 7, no.4 , 2018, pp. 33-49.