REVIEW ARTICLE

Prevalence of fall among geriatrics-A Systematic review

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Abstract

Objective:
The objective of this review was to conclude the findings of multiple studies on prevalence offalls among geriatrics.

Methodology:
This systematic review had done by searching on Google Scholar, PubMed, HEC digital library PEDRO, Cochrane library, Medline, web of science and Scopus databases and search engines from 2000 to 2020. All the literature was searched with MESH terms and key word prevalence, risk factors, fall, community older dwelling, older adults and elderly etc. After keen screening only 12 studies fall in inclusion criteria. quality assessment of included articles were assessed by AXIS Tool designed for observational cross-sectional studies.

Results:
The smallest sample group was in Almeida L et al in 2019, study done in Brazil with 211 participants (1). The largest sample size was in Chang VC et al in 2015 study done in Canada with 14881 participants (2). In all of studies, lowest prevalence was showed in Pu-Lin Y et al study done in 2009(3). The highest prevalence was reported in Sotoudeh GR et al study done in 2018(4).

Conclusion:
It is concluded that prevalence of fall among older people is very high and related to many otherrisk factors intrinsic and extrinsic factors.

Keywords:
Prevalence, fall, community older dwelling adults

Introduction

The older adult population size is increasing day by day. The world's senior population is rapidly growing and is close to 10% of all people. And in the following eras, particularly in emerging nations, this figure is predicted to double[5]. Social security, public and private pensions, health care benefits, and long-term treatment are just a few of the multiple issues associated with the physiological aging process prevalent in industrialized nations in Europe and North America. Fewer developed or underdeveloped countries see that slower aging rate or economically less burden[6]. The age demographics are already well described; in 2030, more than 1 billion people will be over 65. Estimated ratios for North America and Europe are 19.6% and 23.0%, 4.6% for Africa, and 11.5% for Asia.[7, 8]. The population of 80+ geriatricians varied from 450(Austria) to 25000 (turkey)[9].

The older people population is increasing globally, and Pakistan is following the same trends observed in Asia. Pakistan's demographics chart showed that the population of 60+ people increased by 75.1%. This trend was noted between 1990 to 2010. WHO reports that 5.6% of Pakistanis are 60 years of age, and expected to be double in 2025[10]. The mechanism of growth of the aging population falls into two categories. First, that is related to the natural biomedical process of aging, which leads to chronic diseases and ultimately results in disability in old age. The second concern is the cost of treatment and plan of care[11]. Falls and fall-related injuries in older adults are the leading worldwide healthcare issues with population aging. Older adults experience injury as their sixth highest cause of mortality, and falls account for most fatal injuries[12].

Falls-related injuries are a leading socioeconomic burden on society. (WHO) In Hong Kong, Singapore, and Taiwan, the prevalence of falls among older Chinese persons varies from 14.7% to 34.0%13, whereas, in the Western, the prevalence has been observed to range from 28.0% to 42.0%. The probability of older adults falling is reported to range from 19.1% to 47.0% in Malaysia[14, 15] Studies in Asia reported that the prevalence of falls in Japan was 21.7%(13, 16-18), in Hong Kong at 26.4%[19], and in India at 28.8%(19-21). Studies in the West reported a higher

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prevalence in Canada, 31.7%. In the US, 42.0%. In America, 28% and in Brazil, 41.0%. Incidence of falls 65+ aged older adults reported 20% annually worldwide[16].

In multiple countries, studies reported that older nursing home residents have a higher risk of falls than community older-dwelling adults. However, older residents at nursing homes are associated with increased morbidity, disabilities, and healthcare financial burden to the older one and its family members, paramedical staff, and government[17, 18]. All components were divided into eight groups: pathological factors, external environmental factors, socioeconomic state, pathological factors, disease phases, functional assessment, health and physical state, medication effects, behavior and psychological health, and demographic characteristics[19]. The pathophysiology of falls is multi-dimensional because of age-related physiological fluctuations, such as disturbed sight, hearing, and locomotors. Or other morbidity-related factors include cardiovascular, genitourinary, gastrointestinal, psychiatric, endocrine, and medicines iatrogenic or environmental factors.

The reorganization of risk factors is crucial to plan preventive steps. Motion issues and muscle weakness accounted for 10-25% of the falls[21]. According to recent studies, proximal muscle weakness decreases the quantity of compensatory movement in the arms, while distal muscle weakness causes postural instability[22]. In the assessment process, it is crucial to check the relation and the synergism among several reasons for falls. The pathology is multifactorial[23]. Furthermore, research has demonstrated that there is a correlation between the number of risk factors and the risk of falling; the proportion of elderly patients living in the community who experience ongoing falls increases from 10% to 69% when the severity of the risk factors is increased by at least 4[24].

The collaboration of numerous topic experts is required for multifactorial evaluation (geriatricians, physiotherapists, social workers, and orthopedists). The geriatrician integrated the multidisciplinary strategy to create the most efficient assessment process of the risk of falls, finding all risk factors—medical, social, and environmental—and directing towards a prevention programme[25]. American Geriatrics Society Guidelines advised modifying the environmental surroundings, training paths, hip protectors, and reasonable use of supportive tools (canes, walkers). Drug protocols that have been recommended must be carefully reviewed since they can influence a multifaceted intervention program. Their standalone usage, without due evaluation of all other risk components, is not recommended. Balancing exercises are also prescribed. Although physical activity has proven beneficial, the best kind, length, and level of exercise necessary for avoiding falls are still uncertain.[26,27]

Study Design:

Systematic Review

Setting:

A systematic review has been done in The University of Lahore, UIPT Department

Study Duration:

The review was completed over 3 months, from January to March 2021.

Searching Strategy:

Studies were collected from these search engines Google Scholar, PubMed, HEC digital library PEDRO, Cochrane library, and Medline databases from December 31st, 2000. All the studies containing keywords of prevalence, fall, geriatrics, older adults, and community older dwelling in their titles and abstracts were seen and included in the research, searched with BOOLEAN operations and wildcards.

Inclusion Criteria:

All observational cross-sectional study designs were included in which the population was aged 60 years or greater than [1]. Both gender-based studies were included[2]. All those studies were included, with free access, and full-text articles were available. Only those articles that were included which are published in the English language. There was no hand-searching performed.

Exclusion Criteria:

All observational studies in which the population faced falls due to neurological deficits, unclear population, buying articles, abstracts, other languages published articles, and studies with copyright issues are excluded. All other languages articles and copyright permission.

Eligibility criteria:

Study Selection: A total of 1326 studies were seen upon screening. Only 12 studies were left that fall in the inclusion criteria.

Material & methods

Fig. 1: Prisma Diagram for Inclusion of Studies
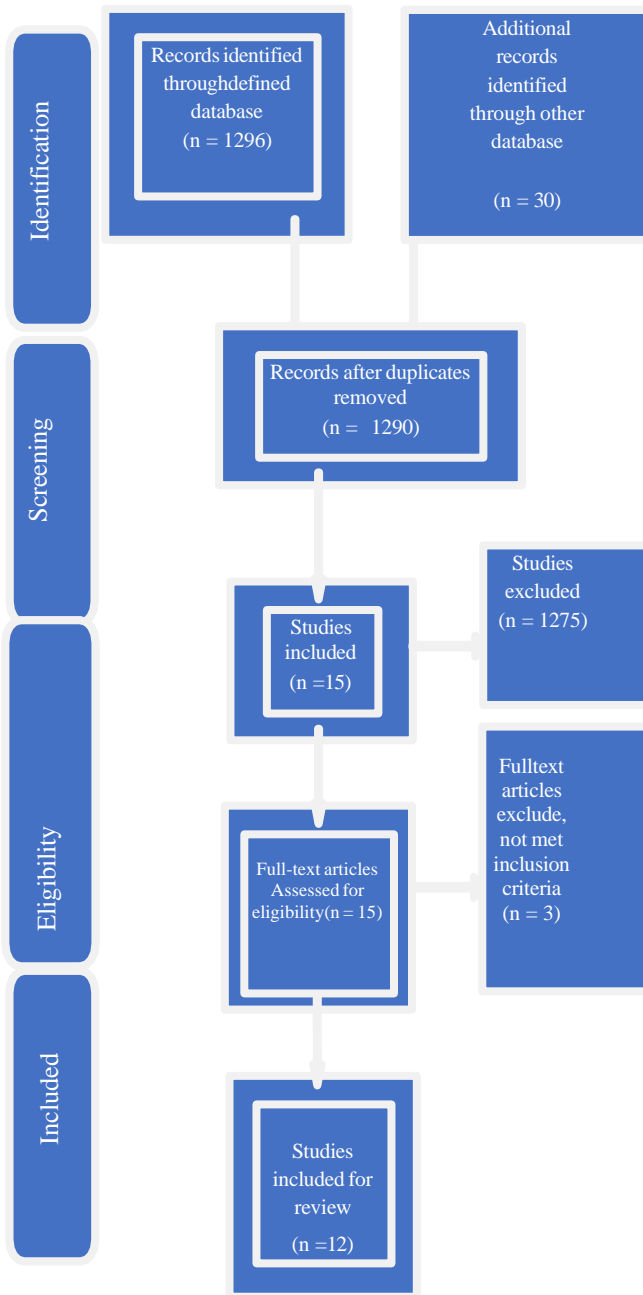
Results

Autor Published Year	Sample	Age Year	Gender	Duration	Source
Cesari M, Landi F Et Al., 2002(6)	5570	77.2	Male Female	3 Months	Silver Network Home CareProject Italy
Reyes-Ortiz Caet Al 2005(7)	9765	>65	Male/ Female	12 Month	Health, Well-Being, AndAging in Latin America And The Caribbean
Siqueirafv,Et Al 2007(8)	4,003	> 65	Male/ Female	12 Month	Primary Health Care In BrazilState
Pu-Lin Y Et Al 2009(3)	1512	> 60	Male/ Female	12 Month	Longtan Community, Beijing
Azidah A, EtAl 2012(9)	288	>60	Male/ Female	11 Month	East Coast Of Peninsular Malaysia
Bouldined Et Al 2013(10)	8018	>60	Male/ Female	27 Month	National DatabaseNursing Quality Indicators Centre
Chang Vc EtAl. 2015(11)	14881	>65	Male/ Female	11 Month	Canadian Community Health Survey Healthy Aging
Kioh Sh Et Al 2018(12)	357	>60	Male Female	10 Month	Nursing Homes In Penang,Malaysia
Mortazavi	450	>60	Male Female	8 Month	Bojnrud, Northeast OfIran,
Sotoudeh GrEt All 2018(4)	653	>60	Male Female	12 Month	Tehran
Vieira Ls EtAl2018(2)	1451	>60	Male Female	12 Month	Universidade Federal DePelotas
Almeida L EtAl 2019(1)	211	≥65	Male Female	12 Month	University Of Rio GrandeBrazil

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Table 2:

AUTHOR PUBLISHED YEAR	PREVALENCE
Cesari M, Landi F, et al., 2002(6)	35.9%
Reyes-Ortiz CA et al 2005(7)	34%
Siqueira FV, et al 2007(8)	34.8%
Pu-Lin Y et al 2009(3)	18.0%
Azidah A, et al 2012(9)	18.8%
Bouldin ED et al. 2013(10)	39.2%
Chang VC et al. 2015(11)	20.1%
Kioh SH et al 2018(12)	32.8%
Mortazavi H et al 2018(13)	35.7%
Sotoudeh GR et al 2018(4)	39.7%
Vieira LS et al 2018(2)	28.1%
Almeida L Et Al 2019(1)	28.9%

Quality assessment

The Axis tool (range 1-20) was chosen as it is fundamentally assigned for cross-sectional studies and included items relevant to this study design only. It didn't include a numerical rating that can be used to produce quality assessment scores; instead, the tool aimed to assess the individual characteristics of a study cumulatively. Two assessors independently rated each study for eligibility and methodological quality and extracted data.

Risk assessment

Three studies showed non-response biasness in which participants were left out, and this caused an impact on the results of the study. Those participants were beyond of exclusion criteria. They signed consent but didn't continue the research protocol. Two studies didn't take consent from participants, but it didn't affect them because no participants left the study. Thus, it is concluded that there is somehow riskto the efficacy of systematic review

Discussion

Fall is an event that means unintentional fall toward the ground or any other lower surfaces [39]. Falls are one of the leading causes of morbidity and mortality in 60 aged older people. When they faced falls, they encountered injuries like hip, spine, or pelvic fractures due to strikes with the hard surface. The rate of fall-induced injuries is 37%[3]. Even without injury falls, there is less confidence in patients to become physically active ultimately results in higher dependency and social isolation. Many authors reported fall as a multifactorial syndrome with multiple dimensions[28, 29]. Falls in the elderly have a complex type of epidemiology[30].

Different factors are interlinked with complex relations, including physiological, behavioral, environmental, and socioeconomic factors, involved in fall events in the elderly(31). Studies showed a prevalence rate of falls is 39.7%[4]. Studies revealed that the incidence of falls

increases with age and history of falls, gender-based women are more susceptible[32, 33] to falls than men, and these findings are stable in every study related to it[34, 35]. Being female, having low income, and having less education are independently associated with fall[4]. In some studies, researchers reported that orthostatic hypotension is also one of the risk factors for falls[34, 36].

Some studies revealed that being widowed/separated is related to cause a high risk of falling[37]. Lifestyle, behavior, and physical activity remained significant factors associated with fall [38]. More physically active seniors are less likely to fall [39 or 40]. Some studies reported that household workers and illiterate are more prone to falls, but the literature showed that this interaction is more complex and not defined to one factor[41] for both genders. Researchers reported that most fall occurs in the afternoon, which is also a stable fact with previous studies. A possible reason is that people feel tired or drowsy in the afternoon after hectic morning tasks[42].

Studies reported that half of the falls occurred at home, and one-fifth occurs in outside the home. Falls at home are more prevalent in females than men[43, 44]. One–fifth of the fall occurs in the forward direction. Balance depends on the center of mass. When falls occur in a forward direction, the center of mass will shift forward. Evidence was found on a significant age difference for the anteroposterior (A/P) COM motion with decreased motion in older people[45]. Loss of balance is the most commonly revealed cause of falls (31.3%). Balance problem increases with age. In most cases, balance problems develop without any causes. Many risk factors for balance are gait disturbance, ear infection, visual disturbance, arthritis, etc[33, 46].

A study proved that depression and falls indirectly relate to anti-depressant medications to counter depression. Depression is related to fear of falls, gait variations, nutritional compromise, cognitive malfunctioning, and other underlying pathologies. But their exact mechanism is unknown[47, 48] studies found a relationship between diabetes and falls due to peripheral neuropathy complications. The primary causes are reduced renal and vision function [49, 50].

Fall in the geriatric population became a significant and crucial socioeconomic burden. The studies showed that fall induced injuries ratio is 37.7% in older ones. These fall-induced injuries include mostly soft-tissue bruises and hip fractures [39, 40]. Studies showed that each treatment for hip fracture due to fall is 16500 Yuan, which is too expensive or higher than the annual average income of pennants in urban China(3, 51, 52).

Conclusion

This Systematic review has concluded that fall is highly prevalent in community-dwelling adults; fall prevalence rate may be varied due to associated factors. Fall is significantly associated with intrinsic and extrinsic factors. The previous studies proved falls correlated with reversible factors. There should be a multidisciplinary approach to preventing falls in older people putting all risk factors in one frame that is

identified to prevent falls with appropriate training, planning, and interventions.

Author Contributions
Conception and design: *Maria Shakoor*
Collection and assembly of data: *Iqra Ikram*
Analysis and interpretation of the data: *Maria Shakoor*
Drafting of the article: *Iqra Ikram*
Critical revision of article for intellectual content: *Maria Shakoor*
Statistical expertise: *Maria Shakoor*
Final approval and guarantor of the article: *Iqra Ikram*
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