ISSN 2397-5628

JOURNAL OF GERIATRIC CARE AND RESEARCH

2021, Volume 8, No 2

ISSN 2397-5628

Journal of Geriatric Care and Research

Description

The Journal of Geriatric Care and Research (ISSN 2397-5628) is a multidisciplinary, peer-reviewed, international journal covering all areas related to the care of the elderly. It is affiliated to Geriatric Care and Research Organisation (GeriCaRe). It publishes articles from all fields relevant to old age such as geriatric medicine, psychiatry, neurology, nursing, end of life care, public health and related fields like gerontology, sociology, psychology, culture and law. Besides the professionals, the journal intends to reach older persons and their carers as its readers. The key feature of the articles is their contribution towards the care of elderly through reporting, discussing and debating current issues of importance.

Aim and scope

The Journal of Geriatric Care and Research intends to share evidence based knowledge improving care of the older persons. It is dedicated to showcase recent advances in various fields from basic sciences to medicine and social sciences to cultural and legal issues in the field of geriatric care. It takes a holistic view highlighting interrelationship of various disciplines contributing to general well-being and quality of life of the older persons throughout the world.

Submission

The Journal of Geriatric Care and Research covers a whole range of topics through authoritative articles submitted from across the globe. Manuscripts for publication should be prepared according to the 'Instruction to authors' and submitted by email at jgcr.gericare@gmail.com. All papers in this journal are peer-reviewed. No person is permitted to take any role in the peer-review process of a paper in which they have an interest.

Subscriptions

The journal is freely distributed. Individuals and organizations interested to receive the journal should contact jgcr.gericare@gmail.com for e-subscriptions.

Sponsorship

The Journal of Geriatric Care and Research is free to readers and authors. It reaches out to older persons, their carers and multidisciplinary professionals involved in care and support of older persons. The journal depends upon sponsorship rather than charging authors or readers to meet its cost of operations. There are many sponsorship options and we invite you to consider sponsoring this charitable venture.

Sponsors and contributors names will be displayed prominently in the 'Sponsors & Contributors' section of the Journal.

The journal adheres to a strict policy of keeping all editorial process of the journal independent of the financial sponsors and contributors. The sponsors and contributors do not influence material published in the journal. Assignment of any internal roles (such as reviewer, editor, etc.) depends exclusively on demonstrated competence, along with interest in the journal's aims and scholarly engagement with the journal.

Advertising

Correspondence should be addressed to GeriCaRe through email at org.gericare@gmail.com. Journal does not endorse any advertised material and it reserves the right to accept or reject the advertisement proposals.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Publisher
Geriatric Care and Research Organisation (GeriCaRe)
Sponsors
The Institute of Insight (MetaInsight)
Quality of Life Research and Development Foundation (QoLReF)
Creative Support
GenX Studios, Shreyan Kar, Gabrielle Johnson
Correspondence
Steps to Health, Showell Circus, Wolverhampton, WV10 9TH, UK
jgcr.gericare@gmail.com

Journal of Geriatric Care and Research

NLM Title Abbreviation:	J Geriatr Care Res
ISO Abbreviation:	J Geriatr Care Res
Title(s):	Journal of geriatric care and research.
Other Title(s):	JGCR
Publication Start Year:	2014
Country of Publication:	England
Publisher:	Geriatric Care and Research Organisation (GeriCaRe)
Language:	English
ISSN:	2397-5628 (Electronic) 2397-5628 (Linking)
Electronic Links:	https://independent.academia.edu/jgcr https://instituteofinsight.org/journals/jgcr/all-issues/
NLM ID:	101736616 [Serial]
OCoLC	1013748579

Indexing and archiving

PubMed: Selected citations only [Citations are for articles where the manuscript is deposited in PubMed Central (PMC) in compliance with public access policies.]
Index Copernicus
CiteFactor
JournalGuide
Scope database
Publons
Google Scholar
Ulrich's (ProQuest)
LAWMUNION
National Union List of Journals (UK and Republic of Ireland)
British Library, UK
The Library of Congress, USA

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Contents

The Institute of Insight

[A non-profit organisation]

United Kingdom

The Institute of Insight is a non-profit organisation with an objective to advance education, promote health and creativity to improve quality of life by providing opportunities for lifelong learning, training, appropriate services, research, and publications for the benefit of general public and professionals worldwide.

The Institute is working in partnership with Quality of Life Research and Development Foundation (QoLReF) and Geriatric Care and Research organisation (GeriCaRe) which are academic and charitable organisations supported by resource persons worldwide.

The Institute of Insight is currently supporting various public education initiatives, research related works and publications. It is contributing to the Healthy Ageing Conference a public education event in India, for elderly people and their caregivers. It sponsors publication of Journal of Geriatric Care and Research, which is freely available to general public and professionals.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Editorial

Role of transcranial direct current stimulation in management of headache in geriatric population: opportunities and challenges

Sujita Kumar Kar, Amit Singh, Babli Kumari

Abstract

Despite significant evolution of medical research, still lots of challenges exist in the management of headache. It becomes more difficult, in case of elderly in the usual background of comorbid conditions and multiple medications. Till date pharmacological management remains the mainstay treatment of headache, irrespective of the age of presentation. In the recent years, neuromodulation techniques like transcranial direct current stimulation have been tried in the management of headache. This article discusses the potential advantages and challenges with the use of transcranial direct current stimulation in the management of headache in geriatric population. This may help clinicians to understand about the relevance and scope of this method of treatment.

Key words

Analgesic, Elderly, Headache, Pain, Transcranial Direct Current Stimulation

Introduction

Headache is a common problem in the geriatric population. It significantly affects functioning and compromises the quality of life.[1] Epidemiological research suggests that the one-year prevalence of tension-type headache in the elderly is 44.5%, followed by migraine headache (11%) and other headaches (3%).[2] The prevalence of chronic headache is approximately 3%.[3] Despite a decline in the headache prevalence with increasing age, in the elderly, it is the commonest neurological symptom.[4]

Treatment of headache can be a challenging task at times for clinicians. Analgesics are commonly prescribed medications for the acute management of headache. Similarly, tricyclic antidepressants, valproate, topiramate, gabapentin, beta-blockers, calcium channel blocker, and triptans are also used for the management of headache. In recent years, various neuromodulation techniques like vagus nerve stimulation (VNS), transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (tDCS) have been used in the management of headache, with variable success.[3,5,6] The common target areas of neuromodulation for headache management are: sphenopalatine ganglion, occipital nerve, vagus nerve, hypothalamic deep brain region and supraorbital region.[3]

Regarding the effectiveness of tDCS in the management of chronic migraine, the evidence is conflicting. In a randomized clinical trial on 135 patients with chronic migraine, it was found that there is no difference in the outcome between the groups receiving cathodal tDCS, anodal tDCS, and sham tDCS.[7] However, evidence also suggests that the use of tDCS in treatment-refractory chronic migraine reduces the frequency and severity of the episodes, need for medications (analgesics), and triptans.[8] In another randomized clinical trial, tDCS targeting the prefrontal cortex and left primary motor cortex revealed that patients receiving active treatment have a higher reduction of symptoms in comparison to those receiving sham tDCS.[9] Response was in the form of reduction of pain intensity and improvement in quality of life. The group who received tDCS over the primary motor cortex (M1) experienced more side effects, like excessive sleepiness and burning sensation than the group who received tDCS over the prefrontal cortex.[9] A Cochrane database systematic review revealed that in short-term management of chronic pain, tDCS has better efficacy in pain reduction than the sham control; however, the quality of evidence is poor.[10] Evidence suggests that tDCS is a safe and well-tolerated treatment.[7,8,11]

Various brain areas are being targeted for the management of pain. Motor cortex stimulation is done to produce analgesia. This activates the descending pathways of the brain and facilitates the inhibitory control of nociceptive transmission.[7] Altering cortical excitability, both by stimulation and inhibition, may help in producing analgesia.[7] Dorsolateral prefrontal cortex (DLPFC) is another potential target of tDCS for headache and pain management.[9] The DLPFC is responsible for processing information related to cognition and emotional aspect of the pain.[9,11] The tDCS has also been suggested to stimulate the peripheral nerve endings in the scalp leading to pain relief.[12]

The potential advantage of using tDCS for headache in the geriatric population may be:

Minimal interference with medications used for medical comorbidities: Geriatric patients often have multiple

medical comorbidities for which they receive multiple medications. The use of additional medications for pain management may interfere with the action of the ongoing treatment for medical comorbidities.

Minimizing the use of analgesics and avoiding their potential side effects: Use of analgesics for headache may cause some serious gastrointestinal and renal side effects. Use of tDCS may reduce the requirement of analgesics, thereby reducing the associated risk of their side effects.

Reducing the cost of care: Medication-related expenses can be minimized, as tDCS is a safe and cost-effective treatment modality.

However, there may be certain challenges related to the use of tDCS in the management of headache in geriatric population, which can be:

Availability and accessibility of tDCS: As this facility is limited to only a few of the higher centers in the lower- and middle-income countries (LAMICs), availability and accessibility to tDCS could be difficult.

Lack of expertise of clinicians: tDCS being a newer modality of neuromodulation, a majority of the mental health professionals and neurologists are not trained on delivering tDCS. Lack of expertise may pose a major challenge to its appropriate administration.

Time consuming procedure: A single session of tDCS requires at least 20 minutes, and preparation of the patient for tDCS may need some additional time. Often, a single patient requires multiple sessions on consecutive days, which makes it a time-consuming procedure. Heavy workload and time constraints amongst the clinicians of LAMICs may act as a limiting factor in adopting tDCS in the management of pain and headache.

Frequent traveling to hospitals or clinics: The patients are administered at least 5 to 10 sessions of tDCS over a period of one to two weeks, for which they may have to travel to the clinical facilities frequently, at times daily. It may be difficult for the older adults to have frequent hospital visits to receive the intervention.

Despite all these limitations, tDCS may be a useful treatment modality in the management of headache in the elderly. There is a paucity of research on tDCS use for headache management in the geriatric population as the majority of research excludes older adults from their studies to limit potential biases. There is a need for extensive research on the use of tDCS for management of headache in older adults due to its potential advantages over conventional medications.

Author information: Sujita Kumar Kar, MD, Associate Professor, Department of Psychiatry, King George's Medical University, Lucknow, UP, India, Email- drsujita@gmail.com; **Amit Singh**, MD, DM, Assistant Professor, Department of Psychiatry, King George's Medical University, Lucknow, UP, India, E-mail- amitsingh0612@gmail.com; **Babli Kumari**, MBBS, Junior Resident, Department of Psychiatry, King George's Medical University, Lucknow, UP, India, E-mail- bablikumari.bk@gmail.com

Correspondence: Sujita Kumar Kar, MD, Department of Psychiatry, King George's Medical University, Lucknow, 226003, Uttar Pradesh, India, Email: drsujita@gmail.com

Competing interests: None

Received: 20 September 2021; **Revised:** 23 September 2021; **Accepted:** 26 October 2021

Citation: Kar SK, Singh A, Kumari B. Role of transcranial direct current stimulation in management of headache in geriatric population: opportunities and challenges. Journal of Geriatric Care and Research, 2021, 8, 2: 41-42.

References

1. Stovner LJ, Nichols E, Steiner TJ, et al. Global, regional, and national burden of migraine and tension-type headache, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol* 2018; 17: 954–976.
2. Prencipe M, Casini AR, Ferretti C, et al. Prevalence of headache in an elderly population: attack frequency, disability, and use of medication. *J Neurol Neurosurg Psychiatry* 2001; 70: 377–381.
3. Leone M, Cecchini AP. Central and Peripheral Neural Targets for Neurostimulation of Chronic Headaches. *Curr Pain Headache Rep* 2017; 21: 16.
4. Kaniecki RG, Levin AD. Headache in the elderly. *Handb Clin Neurol* 2019; 167: 511–528.
5. Lambru G, Matharu MS. Peripheral neurostimulation in primary headaches. *Neurol Sci Off J Ital Neurol Soc Ital Soc Clin Neurophysiol* 2014; 35 Suppl 1: 77–81.
6. Miller S, Matharu M. Non-invasive Neuromodulation in Primary Headaches. *Curr Pain Headache Rep* 2017; 21: 14.
7. Grazzi L, Usai S, Bolognini N, et al. No efficacy of transcranial direct current stimulation on chronic migraine with medication overuse: A double blind, randomised clinical trial. *Cephalalgia* 2020; 40: 1202–1211.
8. Przeklasa-Muszyńska A, Kocot-Kępska M, Dobrogowski J, et al. Transcranial direct current stimulation (tDCS) and its influence on analgesics effectiveness in patients suffering from migraine headache. *Pharmacol Rep PR* 2017; 69: 714–721.
9. Andrade SM, de Brito Aranha REL, de Oliveira EA, et al. Transcranial direct current stimulation over the primary motor vs prefrontal cortex in refractory chronic migraine: A pilot randomized controlled trial. *J Neurol Sci* 2017; 378: 225–232.
10. O'Connell NE, Marston L, Spencer S, et al. Non-invasive brain stimulation techniques for chronic pain. *Cochrane Database Syst Rev* 2018; 4: CD008208.
11. Mansour AG, Ahdab R, Khazen G, et al. Transcranial Direct Current Stimulation of the Occipital Cortex in Medication Overuse Headache: A Pilot Randomized Controlled Cross-Over Study. *J Clin Med* 2020; 9: E1075.
12. van Boekholdt L, Kerstens S, Khatoun A, et al. tDCS peripheral nerve stimulation: a neglected mode of action? *Mol Psychiatry* 2021; 26: 456–461.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Research

Association between gait variability and direction-specific postural stability in a middle-age sample: a quantitative study with single and dual-task paradigm

Velayutham Selva Ganapathy, Sadananda Valli Retnaswami Chandra, Srikala Bharath, Mariamma Philip, V. Bhadri Narayan

Abstract

Background: Balance efficacy starts declining from middle age. Information on the relationship between specific sub-components of balance and gait stability in a middle-aged group is crucial to implement effective preventive measures of falls in the elderly. **Methods**: Healthy volunteers (n=50) between 45 to 65 years of both genders underwent a quantitative measurement of balance and gait on both single and dual-task paradigms. **Results**: Significant positive correlation was found between anteroposterior index (API) with Coefficient variation of Step Length of both lower limbs (r = 0 .289, p = 0.042 & r = (0.372), p =0.008 and (r = 0.444, p = 0.001 & r = 0.444, p = 0.001) at single and dual task respectively. **Conclusion**: API was found to be associated with gait stability in the middle age group. However, considering the cross-sectional nature of this study, the inference needs to be confirmed in future studies to establish the causal relationship.

Key words

Dual Task, Gait, Gait Dysfunction, Gait Variability, Middle Aged, Postural Balance

Introduction

Fall is considered a leading cause of poor quality of life among the elderly. The prevalence rate of falls is reported to be as high as 40%.[1] Fall-related psychological concerns (FrPC) are many and include balance confidence, fear of fall, fall-related self-efficacy& outcome expectancy.[2] Often, it results in restricted physical activity imposed by self as well as by the family members with associated poor quality of life.[3] Hence fall prevention measures need to be started early. It has been postulated that fall screening can be initiated during the regular health check-up with the general physician.[4] One of the early signs of fall risk in the elderly is increased gait variability/gait instability which is a subtle change in gait characteristics in terms of coefficient variations. As balance is considered one of the contributing factors for gait variability, measuring gait variability and the associated balance indices may be useful in planning interventions for the prevention of falls. Fall prevention strategies in the elderly focus on multi-directional balance training with specific emphasis on lateral balance training.[5-8] This inference is based on the relationship established between gait variability with specific sub-components of balance indices in the elderly.[9,10]

While the aforementioned studies have compared and analyzed the relationship between gait and balance in the elderly, but not much in the middle age population using quantitative measurements.[11] Research indicates that the ability to balance oneself starts declining in middle age itself with a prevalence of 21% and further increases in old age.[12-14] As the changes in balance and gait in the middle age population are likely to be subtle, to be of translational relevance, quantitative balance and gait measurements involving cognitive distraction (dual-task paradigm) should be carried out in place of conventional clinical measures. Studies with dual-task paradigms simulate the daily life context, however in reality there are distractive thoughts/ messages/ sights when one is walking.

This study was planned with due cognizance of the above facts. It was designed to correlate balance and gait parameters using both single and dual-task paradigms in a middle-aged sample. The information obtained may help the practitioner to identify the 'at risk' population in middle age towards planning an effective balance training program to improve their gait stability even if distracted and to plan "fall prevention strategies" and FrPC thereof in their old age.

Objective

The specific objective of the study was to identify the direction-oriented balance indices correlating with kinematic gait parameters in a selected sample of middle-aged volunteers using quantitative measures under single and dual-task paradigms.

Methods

It is an observational cross-sectional study that included healthy volunteers from the community between the age group of 45 to 65 years (n=50). Hindi Mental Status Examination (HMSE) score used for screening global cognition with the cut-off score of 26 and above was included.[15] People with severe cardiopulmonary events, neurological disorders with and without cognitive impairment, psychiatric disorders, uncontrolled diabetes, hypertension, orthopedic complications that limited their ability to walk, and persons with visual impairment were excluded from the study. The institute ethics committee approved the study after scrutiny. Informed consent (written) was obtained from the participants in their local language. The participants underwent balance and gait measurement under single and dual-task paradigm. The correlations between various gait characteristics including gait variability and a specific sub-component of balance were analyzed for single and dual-task separately.

Setting

The Balance & Gait Lab of the National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru, India.

Gait measurement

Gait was measured using a treadmill-based kinematic gait analysis. Treadmill walk has the advantage of collecting kinematic data in a short period.[16] The participants were fastened with a safety harness while walking. Gait speed was set as per one's comfort, opted by the participants. After a practice session of the treadmill walk for about 5 minutes, the participant underwent a test duration of a 2-minutes' walk. After a rest period of about 5 minutes, the test repeated for 2-minutes with the dual paradigm, wherein the subjects were instructed to count in reverse from a hundred while they walk. The following gait parameters were collected namely speed, step length, step cycle, and coefficient variation (CV) of step length in percentage (gait variability).

Balance measurement

Balance measurement was done using dynamic posturography which is a quantitative measurement tool with strong reliability.[16] After a practice session for 5 minutes; the measurement of dynamic balance was done. In the dynamic balance test, the participant was made to stand on a wobble board that acts as a force platform. The ability to maintain their center of gravity within their base of support was measured by calculating the amount of body sway in the anteroposterior index (API) and mediolateral index (MLI) and a cumulative score as an overall balance index (OBI). The sway index varies across the age spectrum. The sway index for the age group of 35 to 53 years is about 1.23 to 3.03 and for the age group of 53 to 71 is about 1.79 to 3.35. Higher scores indicate higher sway and poorer balance. The spearman correlation analysis as a nonparametric test was done to find the association between the balance indices and gait parameters especially the coefficient variation of step length.

Results

Demographic details

Participants of this study were 50 volunteers who consented to be part of the study. The age of the subjects ranged from 45 to 65 years; the mean age of the sample with SD was 57.6 ± 6.15 years with 58% male participants. The years of education ranged from 7 to 17, and the mean years of education with SD were 12 ± 4.04 years. Their mean body mass index (BMI) with SD was 25.6 ± 3.24. Their mean Hindi Mental Status Examination (HMSE) score with SD was 30.18 ± 1.80. The relationship between gait and balance characteristics of the sample was established using the Spearman correlation coefficient (r value) as a nonparametric test and considered significant at or > 0.05. The r^2 value was calculated manually to find out the accountability of individual balance index towards gait variability, which was adapted from a similar study.[9] The mean values of balance indices and gait parameters of both single and dual tasks and the between task analysis (paired t-test) are provided in Table 1 & 2. The dual-task impact has been published earlier,[16] and is not discussed here. The posturography display of sway for the single and dual-task has been provided in Figure 1 A & B.

Table 1. Balance indices of both single and dual-task

Balance Index	Single Task	Dual Task	
	Mean ± *SD*	*Mean* ± *SD*	*P*
OBI	2.26 ± 0.57	2.98 ± 0.73	< .001
API	1.74 ±0.57	2.49 ± 0.76	< .001
MLI	1.49 ± 0.46	1.68 ± 0.55	.582

OBI: Overall Balance Index; API: Anterior/Posterior Index; MLI: Medial/lateral Index

Correlation between balance and gait measurements-Single Task.

There was a significant positive correlation between the OBI with Coefficient Variation of Step Length of the left side (CV SL – L) (r=0.480, p=0.001). No other gait parameter correlated with OBI. The API showed a significant positive correlation to the Coefficient of Variation of Step Length on the right (CV SL – R) (r=0.289, p=0.042) and left (CV SL – L) (r=0.372, p=0.008). The details can be found in Table 3. It denoted that the higher the sway index in AP direction (poorer balance), the larger the variation of the step lengths of both legs, which meant greater the gait instability. Also, API correlated negatively with the distance walked (r=-0.285, p=0.045) and step cycle (r=-0.322, p=0.023). This indicates that the step length, distance walked, and step cycles are influenced by balance, more so in the antero-posterior direction. The positive correlation of OBI and API with Coefficient Variation of Step Lengths during a single task is represented in Figures 2 & 3.

Table. 2 Gait parameters of both single and dual-task with significance

GAIT Parameters	Single Task	Dual-Task	
	Mean ± SD	*Mean ± SD*	*P*
Distance (meters)	73.40 ± 25.23	62.75 ± 25.61	<0.001
Step Cycle (cycle/sec)	0.83 ± 0.15	0.72 ± 0.14	<0.001
Speed (m/sec)	0.60 ± 0.21	0.52 ± 0.20	0.765
Step length Rt (meters)	0.38 ± 0.11	0.37 ± 0.10	0.374
Step Length Lt (meters)	0.34 ± 0.11	0.35 ± 0.11	0.363
CoV[a] Rt (%)	32.78 ± 20.99	39.42 ± 19.40	0.166
CoV[a] Lt (%)	44.52 ± 25.25	46.70 ± 27.50	0.132
Ambulation Index (AI) Max=100	82.62 ± 19.57	81.08 ± 9.789	0.487

Figure 1. Dynamic posturography

A) Single Task ***B) Dual Task***

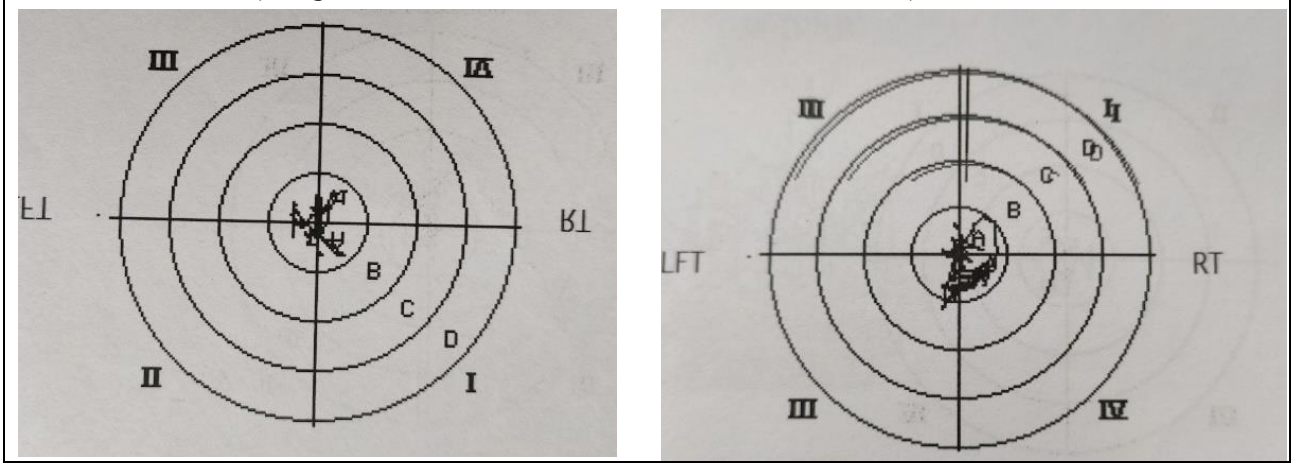


Table 3: Correlation between balance and gait parameters with r and p-value: Single Task

	Spearman's rho	Distance (m)	Speed (m/sec)	Step Cycle (cycle/sec)	Step Length (R) (m)	Step Length (L) (m)	AI	CoV.SL (R)	CoV.SL (L)
OBI	r	.049	-.014	.021	.069	-.041	.123	.056	.480**
	P	.738	.921	.887	.633	.779	.394	.700	.001
API	r	-.285*	-.018	-.322*	-.272	-.097	-.008	.289*	.372**
	P	.045	.901	.023	.056	.502	.956	.042	.008
MLI	r	.022	.120	-.082	-.130	.273	-.045	-.192	-.152
	P	.879	.406	.571	.370	.055	.758	.182	.292

r - Correlation Coefficient; *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed); OBI: Overall Balance Index; API: Anteroposterior Index; MLI: Mediolateral Index; AI= Ambulation Index

Figure 2. Single Task - positive correlation between overall balance index vs coefficient of variation of step length

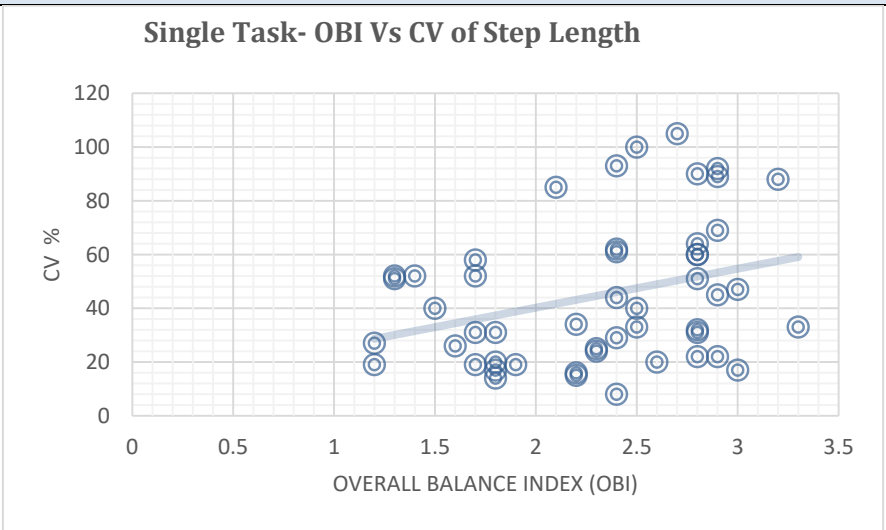


Figure 3. Single Task - positive correlation between anteroposterior index vs coefficient of variation of step length.

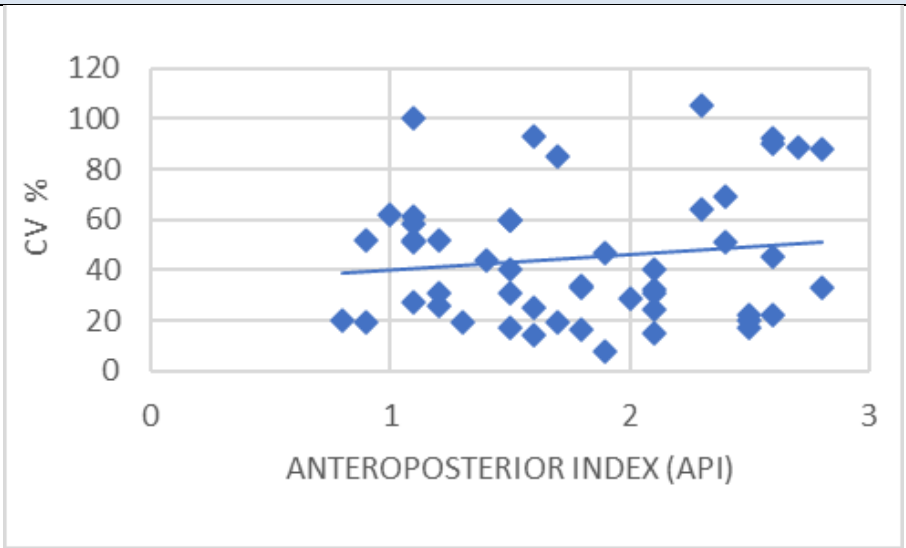


Figure 4. Dual Task - positive correlation between anteroposterior index vs. coefficient variation of step length.

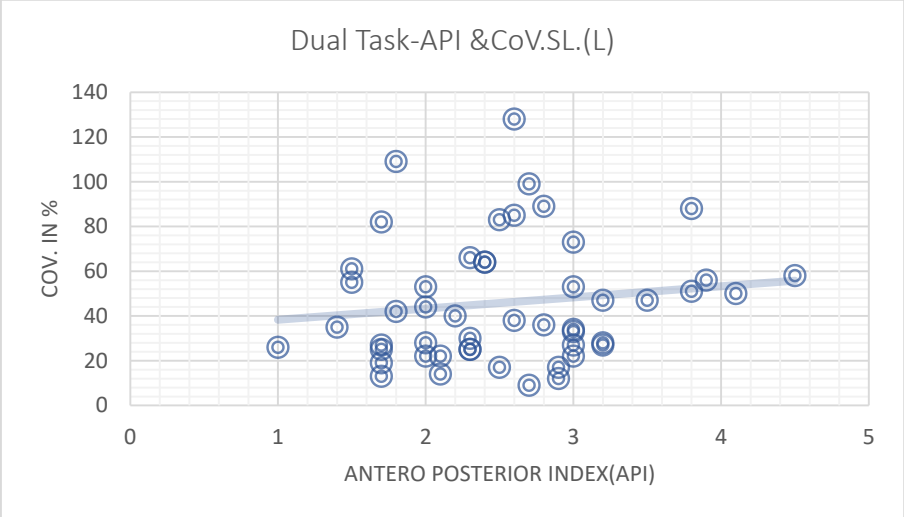


Table 4: Correlation between balance and gait parameters with r and p-value: Dual Task

Spearman's rho		Distance (m)	Speed (m/sec)	Step Cycle (cycle/sec)	Step Length (R) (m)	Step Length (L) (m)	AI	CoV.SL (R)	CoV.SL (L)
OBI	r	.068	.053	-.024	.116	-.001	.113	.160	.160
	P	.638	.715	.867	.421	.995	.434	.267	.267
	N	50	50	50	50	50	50	50	50
API	r	-.589**	-.313*	-.543**	-.391**	-.451**	.423**	.444**	.444**
	P	.001	.027	.001	.005	.001	.002	.001	.001
	N	50	50	50	50	50	50	50	50
MLI	r	.151	.026	.144	.035	.107	.037	-.150	-.150
	P	.295	.860	.318	.811	.459	.799	.299	.299
	N	50	50	50	50	50	50	50	50

r - Correlation Coefficient; *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Correlation between balance and gait measurements-Dual-Task

The API was the only balance parameter that showed a significant positive correlation with Coefficient of Variation of Step Length of Right (CV SL – R) (r=0.444, p=0.001) and Left (CV SL – L) (r=0.444, p=0.001). The correlation of API and CV SL during dual-task is represented in Figure 4. API had significant negative correlation with distance walked (r= -0.589, p=0.001), speed (r= -0.313, p=0.027), step cycle (r= -0.543, p=0.001), step length of right (r= -0.391, p=0.005), step length of left (r= -0.451, p=0.001). The details are provided in Table 4.

In the present study, the findings from the dual-task reiterated the results of the relationship between balance and gait in the single task–that the step length took by a person, speed of walking, distance walked, and step cycles are influenced by balance, more so in the antero-posterior direction. It is important to note that in addition to spatial parameters such as step length, during the dual-task temporal gait the anteroposterior balance also influenced parameter such as gait speed. Poorer antero-posterior balance increased the variability of the step length bilaterally that could lead to greater gait instability and a higher risk of falls. The correlations between MLI and gait parameters did not reach significance both in single and dual tasks.

Discussion

The paramount role of balance indices on gait stability than gait parameters and the onset of changes in the balance especially in the mediolateral direction leading to increased risk of falls in the elderly has been well documented and published in the literature. It was also noticed that the age-related decline in balance and gait starts well early in middle age. Building on that, the present study intended to explore the relationship between gait characteristics and balance indices, among a selected middle-aged sample during single and dual-tasks, thereby identifying the specific balance parameters associated with gait variability and also the role of cognitive distraction which is common in daily life, towards balance and gait variability.

Overall, we found that the balance measurement of API affected the variability of step lengths both during single and dual tasks. It also influenced the gait parameters of step length, step cycle, distance walked, and step speed - both when not distracted (single task) and distracted cognitively (dual-task) – more so in the latter. While the old age population shows the relationship of gait variability is associated in the mediolateral direction, the middle-aged population presented to be in the anteroposterior direction that it seems to be a plane change swift happening as the person getting older. A study by Bailey et al have postulated that higher gait variability in older age was found to be associated with the change in the sagittal plane (anteroposterior) to frontal plane (mediolateral) dynamics at the ankle joint.[17] The detailed discussion on the association of balance and gait parameters of both single and dual-task performance was as follows.

Single Task

In the single task, the OBI contributed about 23% (r^2 = 0.2304), towards "gait variability (CV of step length). Even though OBI is a composite score of both API and MLI, earlier work has observed that API contributes more than MLI to the overall balance index.[18] In this study, API contributed exclusively towards gait variability about 8% (r^2=0.083) and 14 % (r^2=0.138) on right and left sides respectively.

Dual Task

The API contribution towards gait variability during the dual-task was 20% (r2=0.1971), i.e., almost twice the amount of contribution of a single task. No correlation was found between the MLI and none of the gait parameters.

API and Gait Variability in Single and Dual Task

It has been well documented that gait variability, which is a marker of fall, can be influenced by various factors which include both central and peripheral features, and one of the major factors identified is balance efficacy.[19] This study is in line with it, furthermore the specific direction-oriented balance index also have been identified. The present study indicated that gait variability

and other gait characteristics correlated to API significantly both during single and dual tasks in the middle-aged sample; hence, it is postulated that API rather than MLI influence gait characteristics in a pre-elderly stage. The possible reason could be as follows. In a middle-aged sample, the gait variability would have been influenced by the peripheral structures such as force production capacity of the muscle, conduction velocity required for the timely execution, and loss of extensibility of soft tissues around the ankle joint.[20,21] Whereas the oldest-old age group found to have an association of increased gait variability with mediolateral instability and falls with involvement of age-related central motor conduction involvement such as white matter changes.[9,10] Further research with a neuro-radiological correlation of balance and gait association across the age groups especially between 50 to 70 years may reveal the critical age for the evolution of mediolateral imbalance and ensuing gait instability in the elderly.

It is interesting to note that a novel balance measurement was developed to detect mediolateral instability in elders to predict falls.[22] However, the work of Terrier et al with a middle-aged sample had reported that gait instability was associated in the mediolateral direction.[11] we propose that the variation in methodology would have been the reason for the varied result. The major difference in methodology includes the exclusive postural control assessment that had been conducted in the present study, no such individual balance assessment conducted in their study. The core strengths of the current study were - a sophisticated quantitative measurement for balance and gait analysis using dynamic posturography and kinematic gait analysis using a sensor-based treadmill; two, considering the dual/multi-task nature of activities of daily living, including a dual-task paradigm in the protocol. The refinement and complexity between the assessments might explain the difference in balance and gait measurements between the two studies.

The relationship between balance and gait characteristics became more evident during the dual-task in the present study. It is in line with various other studies on the importance of cognition on postural and gait tasks that recommend dual-task testing to predict fall as well as dual-task balance training for falls prevention.[23-27] using dynamic posturography to screen balance impairment may be useful in detecting direction-oriented balance deficits in fall prevention. Since this study has established a relationship of "specific balance indices" namely API and gait characteristics during dual-task, further intervention studies on this model may substantiate the results we have found.

A structured exercise program which includes ankle flexibility, lower limb muscle strengthening with the special mention on ankle group muscle and core and back muscle strengthening, with cognitive training during middle age for maintenance of better balance and gait stability towards prevention of falls in old age is a fertile area of research in near future.

In day-to-day practice, incidents of fall or near-fall experience/slowness in walking can be reported by the middle-aged or elderly or the caretaker to their general practitioner for further referral for cognitive screening. As balance and gait functions require cognitive input, impairment in one warrant to screen for the other. The current work highlights the role of cognitive function in the motor task such as balance and gait using a dual task paradigm.

Limitations

The limitations of the study are small sample size, cross-sectional study design, no comparison with young and old age groups, etc. As gait analysis is done in this study utilized a treadmill-based method, the translational value for the over ground walking may not be there. Hence, the results need to be further validated with a long-term prospective study in a cohort from a young age through middle age to old age with neuro-radiological correlations.

Conclusion

We conclude that the balance and gait characteristics are interrelated, and the specific direction-oriented balance index associated with gait variability in the middle age group sample of this study is anteroposterior rather than mediolateral and this was more pronounced when there is cognitive disengagement due to distraction. Hence, early balance training programs need to be initiated in the fourth decade onwards to prevent gait deterioration in old age. Dual-Task balance training should be the norm in such a program. This may help maximal independence, prevention of falls, fall-related psychological concerns, and finally a better quality of life for the ever-growing senior population. However, the inference made here needs to be confirmed in future prospective studies to establish causal relationship.

Author information: Velayutham Selva Ganapathy, PhD, Senior Physiotherapist, Physiotherapy center, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India, Email: selva2274@gmail.com; **Sadananda Valli Retnaswami Chandra**, MD, DM, Former Professor, Department of Neurology, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Email: drchandrasasi@yahoo.com; **Srikala Bharath**, DPM, MD, FRCPsych, FRANZCP, Former Professor of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS); Bangalore, Karnataka, India, Email: srikala.bharath@gmail.com; **Mariamma Philip**, MSc, PhD, Associate Professor, Department of Biostatistics, National Institute of Mental Health and Neurosciences (NIMHANS); Bangalore, Karnataka, India, Email: dr.mariammaphilip@gmail.com; **V. Bhadri Narayan**, MD, DM, Professor, Department of Neuro-anesthesia, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Email: n_bhadri@yahoo.com

Correspondence: Srikala Bharath DPM, MD, FRCPsych, FRANZCP, Former Professor of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS); Bangalore, Karnataka, India, Email: srikala.bharath@gmail.com

Competing interests: None

Received: 21 May 2021; **Revised:** 3 July 2021; **Accepted:** 6 July 2021

Citation: Selva Ganapathy V, Chandra SR, Bharath S, Philip M, Narayan VB. Association between gait variability and direction-specific postural stability in a middle-age sample: A quantitative study with single and dual-task paradigm. Journal of Geriatric Care and Research, 2021, 8, 2: 43-49.

References

1. Joseph A, Kumar D, Bagavandas M. A review of the epidemiology of fall among elderly in India. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine. 2019 Apr; 44(2):166-168
2. Moore DS, Ellis R. Measurement of fall-related psychological constructs among independent-living older adults: a review of the research literature. Aging and Mental Health. 2008 Nov 1; 12(6):684-99.
3. S. Krishnan. Human Cognition: As We Understand Today (Book review). Chapter 22. Kerala Journal of Psychiatry 2018; 31(1):51-53. DOI: 10.30834/KJP.31.1.2019.161
4. Monagle S. Reducing falls in community-dwelling elderly. The role of GP care planning. Australian Family Physician. 2002 Dec;31(12) 1111-5
5. Maki BE, Holliday PJ, Topper AK. A prospective study of postural balance and risk of falling in an ambulatory and independent elderly population. Journal of Gerontology. 1994 Mar 1;49(2):M72-84.
6. Hilliard MJ, Martinez KM, Janssen I, Edwards B, Mille ML, Zhang Y, Rogers MW. Lateral balance factors predict future falls in community-living older adults. Archives of Physical Medicine and Rehabilitation. 2008 Sep 1;89(9):1708-13.
7. Rogers MW, Mille ML. Lateral stability and falls in older people. Exercise And Sport Sciences Reviews. 2003 Oct 1;31(4):182-7.
8. Lord SR, Rogers MW, Howland A, Fitzpatrick R. Lateral stability, sensorimotor function and falls in older people. Journal of the American Geriatrics Society. 1999 Sep;47(9):1077-81.
9. Cromwell RL, Newton RA. Relationship between balance and gait stability in healthy older adults. Journal of Aging and Physical Activity. 2004 Jan 1;12(1):90-100.
10. Petrofsky JS, Cuneo M. Correlation between gait, balance, and age when people are standing and walking in normal, subdued, and no light conditions. Physical & Occupational Therapy in Geriatrics. 2007;26(3):23-40.
11. Terrier P, Reynard F. Effect of age on the variability and stability of gait: a cross-sectional treadmill study in healthy individuals between 20 and 69 years of age. Gait & Posture. 2015;41(1):170-4.
12. Carbonneau E, Smeesters C. Effects of age and lean direction on the threshold of single-step balance recovery in younger, middle-aged, and older adults. Gait & Posture. 2014 Jan 1;39(1):365-71.
13. Takeshima N, Islam MM, Rogers ME, Koizumi D, Tomiyama N, Narita M, Rogers NL. pattern of age-associated decline of static and dynamic balance in community-dwelling older women. Geriatrics & Gerontology International. 2014 Jul;14(3):556-60.
14. Talbot LA, Musiol RJ, Witham EK, Metter EJ. Falls in young, middle-aged, and older community-dwelling adults: perceived cause, environmental factors, and injury. BMC Public Health. 2005;5(1):86.
15. Ganguli M, Ratcliff G, Chandra V, Sharma S, Gilby J, Pandav R, Belle S, Ryan C, Baker C, Seaberg E, Dekosky S. A Hindi version of the MMSE: the development of a cognitive screening instrument for a largely illiterate rural elderly population in India. International Journal of Geriatric Psychiatry. 1995 May;10(5):367-77.
16. Ganapathy VS, Chandra SR, Bharath S, GS R. Subclinical motor involvement in patients with behavioral variant frontotemporal dementia: A case-control study. Asian Journal of Psychiatry. 2020 Jan 1; 47:101821. doi.org/10.1016/j.ajp.2019.10.001
17. Bailey CA, Porta M, Pilloni G, Arippa F, Côté JN, Pau M. Does variability in motor output at individual joints predict stride time variability in gait? Influences of age, sex, and plane of motion. Journal of biomechanics. 2020 Jan 23;99:109574. doi.org/10.1016/j.jbiomech.2019.109574
18. Arnold BL, Schmitz RJ. Examination of balance measures produced by the biodex stability system. Journal of Athletic Training. 1998 Oct;33(4):323-327.
19. Hausdorff JM. Gait variability: methods, modeling, and meaning. Journal of Neuroengineering and Rehabilitation. 2005 Dec;2(1):1-9.
20. Koushyar H, Bieryla KA, Nussbaum MA, Madigan ML. Age-related strength loss affects non-stepping balance recovery. PloS One. 2019 Jan 18;14(1): e0210049.
21. Svoboda Z, Bizovska L, Gonosova Z, Linduska P, Kovacikova Z, Vuillerme N. Effect of aging on the association between ankle muscle strength and the control of bipedal stance. PLoS One. 2019 Oct 3;14(10): e0223434.
22. Lizama LE, Pijnappels M, Rispens SM, Reeves NP, Verschueren SM, van Dieën JH. Mediolateral balance and gait stability in older adults. Gait & Posture. 2015 Jun 1;42(1):79-84.
23. Park JW, Jung M, Kweon M. The Medio-lateral CoP parameters can differentiate the fallers among the community-dwelling elderly population. Journal of Physical Therapy Science. 2014;26(3):381-4.
24. Sparto PJ, Newman AB, Simonsick EM, Caserotti P, Strotmeyer ES, Kritchevsky SB, Yaffe K, Rosano C. Contributions to lateral balance control in ambulatory older adults. Aging Clinical and Experimental research. 2018 Jun 1;30(6):633-41.
25. Muir-Hunter SW, Wittwer JE. Dual-task testing to predict falls in community-dwelling older adults: a systematic review. Physiotherapy. 2016 Mar 1;102(1):29-40.
26. Montero-Odasso M, Verghese J, Beauchet O, Hausdorff JM. Gait and cognition: a complementary approach to understanding brain function and the risk of falling. J Am Geriatr Soc. 2012;60(11):2127-36.
27. Hiyamizu M, Morioka S, Shomoto K, Shimada T. Effects of dual-task balance training on dual-task performance in elderly people: a randomized controlled trial. Clinical Rehabilitation. 2012 Jan;26(1):58-67.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Insight

Boredom in informal and certified caregivers: a call for research

Josefa Ros Velasco

Abstract

The problem of boredom in the workplace has caught the attention of researchers since the beginning of the past century. Preventing boredom is critical in terms of productivity, but also to ensure the welfare of workers, especially if their job is to care for others. When it comes to professions in which caring is the hallmark, boredom has been treated lightly and quickly. Not to mention that almost no study has been conducted to determine the causes and consequences of caregivers of older adults being bored in the workplace. Both formal and informal caregivers are potential victims of boredom, but not always in the same way. In this paper, I will briefly review and synthesize the few articles that posit boredom as a risk factor for caregivers' welfare in formal and informal settings to make a call for research as a response to the existing knowledge gap.

Key words

Boredom; Boreout; Caregiving; Certified Caregiver; Informal Caregiver; Older Adults

Introduction

Boredom at workplace: identifying a research gap

The problem of boredom in the workplace has caught the attention of researchers since the beginning of the past century.[1] According to the Meaning and Attentional Components Model (MAC) developed by Erin C. Westgate and Timothy D. Wilson, boredom is a state of displeasure resulting from "(a) an attentional component, namely mismatches between cognitive demands and available mental resources, and (b) a meaning component, namely mismatches between activities and valued goals (or the absence of valued goals altogether)."[2] In other words, boredom is an unpleasant state "experienced when people feel either unable or unwilling to cognitively engage with their current activity" or situation because of environmental, attentional, and/or functional reasons.[2]

A positive correlation has been demonstrated regarding boredom and efficiency,[3] maintenance of attention,[4-5] levels of satisfaction,[6-10] motivation, and active/creative participation,[11-16] work-related accidents,[17-24] and feelings of stress and anxiety in the workplace.[25-29] Numerous scales and models for measuring[30-32] and preventing boredom at work have also been developed to date.[33-49] Preventing boredom is critical in terms of productivity,[5,10] but also to ensure the welfare of workers, especially if their job is to care for others.

When it comes to professions in which caring is the hallmark, boredom has been treated lightly and quickly.[37,50-51] Not to mention that almost no study has been conducted to determine the causes and consequences of caregivers of older adults being bored in the workplace. More attention has been paid to boredom in older adults themselves—not too much, as I have showed in other place.[52] But it seems that no one is interested in finding out how boredom affects the health of those who care for them and even their performance.

Being bored *in* the workplace and *with* the job itself can be dangerous in two aspects that reciprocally feed into each other. On the one hand, bored caregivers may experience the discomfort associated with boredom and neglect their caregiving tasks. But, on the other, poor performance may lead to dissatisfaction, which will reverberate into more boredom. This loop can end up making a dent in the physical and mental health of the caregiver.

This applies both to certified/formal caregivers, professionals who assist others with daily tasks in different kinds of facilities and at home after having completed the necessary training and education to acquire the required caregiving skills and experience, and to informal caregivers, people who give care to family, friends, and others, usually not trained in caregiving professionally, regardless of whether they receive a salary.

Experiences of boredom in informal and certified caregivers

Boredom is not unknown among formal and informal caregivers of older adults. It is part of the caregiver syndrome, contrary to what it is usually thought. This is because *being bored* is not equivalent to doing nothing at all. Unlike, boredom is more often experienced in monotonous and repetitive circumstances in which the same caring routine tasks are carried out over and over.

Boredom in informal caregivers

Both formal and informal caregivers are potential victims of boredom, but not always in the same way.[53] According

to Nuki Akter,[54] in a post for *Seniors Matter* (2021), boredom in informal caregivers goes hand in hand with the lack of contact with people other than the older adult.[55-56] Besides, Tamdee et al noted that their boredom was the consequence of the lack of knowledge about care.[57] Presumably, having to dedicate twenty-four hours a day to care is another factor.

Clinical psychologist and family therapist Barry Jacobs explained to *AARP Magazine* (2018) how boring it was to care for his mother:[58]

'I was often bored during my caregiving years. Because we spent so many hours in each other's company, my mother and I usually ran out of things to say to each other, except for what was immediately necessary […]. The fact that family caregivers are more prone to boredom than most people is not due to a lack of interest in the well-being of the people we're caring for. To the contrary, we put up with long stretches of boredom because we want to make a positive difference. But many of the activities that caregiving requires are less than enthralling.'

Not surprisingly, for many, being informal caregivers is like being "a prisoner in your own home" due to boredom, as stated by Woodford et al.[59] This is the case of social worker and aging specialist Donna Schempp,[60] who admitted, on the website of *Family Caregiver Alliance* (2014), that

'It is easy to become bored when you are stuck at home taking care of someone else and not doing things that fulfill your own wants and needs. And by the end of the day, you are often too tired to pursue something of interest to you.'

Writer Ivy Bronwyn described informal eldercare, in *PsychCentral* (2019), as "moments of sheer panic when you're rushed off your feet interspersed with periods of mind-numbing boredom."[61] Despair caused by boredom is palpable in the following chat conversation on the *AgingCare* forum (2019):[62]

'NeedHelpWithMom: Sometimes I get incredibly bored being a full time caregiver. I've kind of lost interest in hobbies I used to love. Sick of television. Don't even listen to my favorite music much anymore. Of course, I do necessary stuff like cook, clean and take care of mom. I'm talking about fun things like jewelry making that I love or other crafts. Anyone else dealing with boredom? Or is it that I struggle with loneliness or even depression? Caringfor1: I know how you feel and pray for all of us on this journey. I often wonder if I'm bored, depressed or angry.
NewGirl: I became extremely bored at my mom's house. And wondered how much longer will she live because I'm getting tired, my mind is mush and I too feel depressed.'

A paper by Colin Reid et al[63] suggested that financial compensation may be the solution to boredom. However, evidence shows that formal/certified caregivers working in nursing homes and other kinds of facilities for older adults get bored frequently too.

Boredom in certified caregivers

Hossain and Ahmed,[64] computer engineers interested in the design of support systems for caregivers in different kinds of facilities for older adults, warned that certified caregivers get bored in institutionalized settings. As an example, Popli and Panday[56] wrote that boredom was common among caregivers of hospitalized older adults, sometimes leading them to act impulsively and to avoid making decisions. Speaking of nursing homes, Rodstein said that boredom, together with loneliness, was the main concern among the staff due to repetitive tasks.[65] After him, many agreed with this affirmation.[66-68,53]

Only one study to date has focused on boredom in caregivers of older adults. This was by Emeritus Sture Åström et al, from Umeå University, published in 1987 in the *Scandinavian Journal of Caring Sciences*.[69] In this paper, more than one thousand caregivers working in long-term care facilities reported being at risk of developing tedium, especially among physicians and registered nurses. A call for further research to prevent boredom among formal caregivers was made then.

Decades after the publication by Sture Astrom et al,[69] boredom continues to be a major problem. The issue will worsen as certified caregivers are younger, gerontologist Rausch points out,[70] as they will be used to a fast pace of life and multitasking and will get easily bored with a field of work in which repetition is the norm.

According to theories on organizational control, we may think that boredom sometimes is the result of direct control, since caregivers cannot decide which activities they undertake.[71-72] Nursing homes' regulations foster boredom by making sure that people perform their tasks.[73-74] Boredom may occur where nursing homes seek to generate a sense of purposefulness and certainty while discouraging reflexivity and critical thinking among their caregivers to ensure that people go about their daily work activities efficiently. Even if the bored caregivers resist organizational control, their resistance may reinforce the control mechanisms rather than disrupt them by keeping complying and performing their tasks independently.[75]

Prevention of boredom in certified and informal caregivers

Everybody has moments of *boredom in* the workplace and experiences *tedium with* the job. However, boredom in the analyzed work context is riskier than in other work environments where caring for others is not involved. It is not understandable that only one researcher has paid attention to this topic. Even if we do not care about caregivers' welfare, it cannot be ignored that their boredom "compromises the care and assistance needed for the vulnerable elderly," as Hossain and Ahmed remark.[64]

Bored caregivers are not able to prevent older adults' boredom. And bored older adults will bore the bored caregivers. If those responsible for promoting a stimulating environment are bored as well, how is it possible to escape boredom? There is perhaps a more

important question: how is it possible to end the monotony, routine, and boredom in our daily caring tasks? In other words: how to introduce variety and spontaneity in these settings without compromising the quality of care?

Hossain and Ahmed developed a care support system based on a virtual caregiver to free humans from work overload and boredom.[64] However, such a system presents two problems: the cost of implementation and the increased levels of boredom and loneliness of the elders themselves who become less in touch with the caregivers. At most, it seems a difficult system to implement in domestic and informal care settings.

Interventions need to take both sides into account to be successful.[76] An initiative focused on preventing boredom in both caregivers and older adults was developed in the nineties by gerontologist Bill Thomas, CEO of The Eden Alternative®, and his team of educators and associates worldwide. They provide a philosophy to move the cultural change forward, towards a person-directed model of care in which caregivers and older adults are care-partners. According to their approach, boredom can be eradicated from care settings just promoting spontaneity and variety. There is not a unique way to do this, a magic formula valid for all cases. But there is a method to achieve this goal in each case, basically consisting of fostering active listening between both parties. Studies conducted in *edenized* settings show that absenteeism and workload are reduced.[77-78] However, The Eden Alternative is not widespread globally and, for now, is mainly devoted to improving the quality of life of care partners in nursing homes.

Conclusions

Several conclusions can be drawn from this insight. The first one is the obvious inference that further research needs to be conducted regarding the causes and consequences of boredom in formal and informal caregivers to propose effective solutions. This is especially so for informal caregivers. Although literature up until now is scarce, it demonstrates that boredom is a critical issue for both caregivers and older adults and that the boredom of one part reverts to that of the other. Thus, holistic models need to be developed and applied on a larger scale and also in informal settings.

Concerning implications for practice, the identification of the current knowledge gaps regarding the causes and consequences of boredom in certified and informal caregivers highlights for scholars the need to conduct research to determine the scope of a continuing problem. More attention needs to be paid to the mental and physical well-being of certified and informal caregivers, as well as to their boredom, on the part of associations, managers, and policymakers to improve current models of person-centered care. Ultimately, complaints about boredom found in forums where informal caregivers go to vent show that it is necessary to create and make available more safe spaces to build supportive communities.

More than ever, it is urgent to join efforts in this direction because of the current global pandemic situation. In a context of self-isolation in formal and informal settings, the experience of boredom is increasing for both parties. We will be ready to start working this way when we are willing to admit that boredom is a risk factor in gerontology.

Acknowledgment

This work was funded by the UNA4CAREER Program (Marie Sklodowska-Curie Actions; Horizon 2020; UnaEuropa), as part of the Research Project PRE-BORED Well-being and Prevention of Boredom in Spanish Nursing Homes.

This is a reviewed, updated, and improved paper from an informative post published on the CENIE's website.

Author information: Josefa Ros Velasco, PhD, UNA4CAREER (MSCA/H2020/UnaEuropa), Postdoctoral Researcher, Complutense University of Madrid, Faculty of Philosophy, Ciudad Universitaria, Plaza Menéndez Pelayo, s/n, 28040 Madrid, Spain; Email: josros@ucm.es

Correspondence: Josefa Ros Velasco, PhD, UNA4CAREER (MSCA/H2020/UnaEuropa), Postdoctoral Researcher, Complutense University of Madrid, Faculty of Philosophy, Ciudad Universitaria, Plaza Menéndez Pelayo, s/n, 28040 Madrid, Spain; Email: josros@ucm.es

Competing interests: None

Received: 1 October 2021; **Revised:** 9 November 2021; **Accepted:** 14 November 2021

Citation: Ros Velasco J. Boredom in informal and certified caregivers: a call for research. Journal of Geriatric Care and Research, 2021, 8, 2: 50-55.

References

1. Münsterberg H. Psychology and industrial efficiency. Boston: Houghton-Miffin; 1913.
2. Westgate EC, Wilson TD. Boring thoughts and bored minds: the MAC model of boredom and cognitive engagement. Psychol Rev. 2018; 125(5): 689-713.
3. Watt JD, Hargis MB. Boredom proneness: its relationship with subjective underemployment, perceived organizational support, and job performance. J Bus Psychol. 2010; 25(1): 163-74.
4. Alikonis CR, Warm JS, Matthews G, Dember WN, Hitchcock EM, Kellaris JJ. Vigilance, workload, and boredom: two competing models. Proc Hum Factors Ergon Soc Annu Meet. 2002; 46(17): 1531-5.
5. Cummings ML, Gao F, Thornburg KM. Boredom in the workplace: a new look at an old problem. Hum Factors. 2016; 58(2): 279-300.
6. Abdolahi B, Damirchi GV, Ganjeh H. Surveying of job boredom proneness effect on job satisfaction and job involvement. IJCRB. 2011; 3(3): 1332-8.

7. Erasmus A. Investigating the relationships between engaging leadership, need satisfaction, work engagement and workplace boredom within the South African mining industry [dissertation]. Kirkland, WA: Northwest University; 2018.

8. Guglielmi D, Simbula S, Mazzetti G, Tabanelli MC, Bonfiglioli R. When the job is boring: the role of boredom in organizational contexts. Work. 2013; 45(3): 311-22.

9. Kass SJ, Vodanovich SJ, Callender A. State-trait boredom: relationship to absenteeism, tenure, and job satisfaction. J Bus Psychol. 2001; 16(2): 317-27.

10. Schaufeli W, Salanova M. Burnout, boredom and engagement at the workplace. In: Peeters MCW, Jonge J, Taris TW, editors. An introduction to contemporary work psychology. West Sussex: Wiley & Sons; 2014. p. 293-320.

11. Butler N, Olaison L, Sliwa M, Spoelstra S. Work, play and boredom. Ephemera. 2011; 11(4): 329-35.

12. Eid M. What do you do when you are bored? Outcomes and moderators of job boredom [dissertation]. Orlando, FL: University of Central Florida; 2020.

13. Gkorezis P, Kastritsi A. Employee expectations and intrinsic motivation: work-related boredom as a mediator. Empl Relat. 2017; 39(1): 100-11.

14. Martins E. Reasons and consequences of work related boredom-cases [dissertation]. Turku, Finland: Turku University of Applied Sciences; 2019.

15. Van Hooff ML, Van Hooft EA. Boredom at work: towards a dynamic spillover model of need satisfaction, work motivation, and work-related boredom. Eur J Work Organ Psy. 2017; 26(1): 133-48.

16. Velasco F. Understanding workplace boredom among service employees: qualitative insights and employee outcomes. JMI. 2017; 29(3): 278-93.

17. Bruursema K. How individual values and trait boredom interface with job characteristics and job boredom in their effects on counterproductive work behavior [dissertation]. Tampa, FL: University of South Florida; 2007.

18. Bruursema K, Kessler SR, Spector PE. Bored employees misbehaving: the relationship between boredom and counterproductive work behaviour. Work Stress. 2011; 25(2): 93-107.

19. Fisher CD. Boredom at work: what, why, and what then? In: Lindebaum D, Geddes D, Jordan PJ, editors. Social functions of emotion and talking about emotion at work. Cheltenham: Edward Elgar Publishing; 2018, p. 68-102.

20. Game AM. Workplace boredom coping: health, safety, and HR implications. Pers Rev. 2007; 36(5): 701-21.

21. Harju LK, Hakanen JJ. An employee who was not there: a study of job boredom in white-collar work. Pers Rev. 2016; 45(2): 374-91.

22. Van Hooff ML, Van Hooft EA. Boredom at work: proximal and distal consequences of affective work-related boredom. J Occup Health Psychol. 2014; 19(3): 348-59.

23. Weinger MB. Vigilance, boredom, and sleepiness. IJEPP. 1999; 9: 69-91.

24. Whiteoak JW, Mohamed S. Employee engagement, boredom and frontline construction workers feeling safe in their workplace. Accid Anal Prev. 2016; 93: 291-8.

25. Gabka KA. Workplace stressors and employee well-being: the roles of affect, boredom proneness, and counterproductive work behaviors [dissertation]. Normal, IL: Illinois State University; 2015.

26. Hammerly A. Office anxiety, office boredom, office monotony [dissertation]. Kalamazoo, MI: Kalamazoo College; 2015.

27. Sousa T, Neves P. Two tales of rumination and burnout: examining the effects of boredom and overload. Appl Psychol. 2021; 70(3): 1018-44.

28. Van Hooff ML, Van Hooft EA. Work-related boredom and depressed mood from a daily perspective: the moderating roles of work centrality and need satisfaction. Work Stress. 2016; 30(3): 209-27.

29. Wan HC, Downey LA, Stough C. Understanding non-work presenteeism: relationships between emotional intelligence, boredom, procrastination and job stress. Pers Individ Dif. 2014; 65: 86-90.

30. Clemons J. Investigating work engagement and affective commitment through a multi-dimensional work underload scale, mediated by work-related boredom [dissertation]. San Bernardino, CA: CSUSB California State University; 2020.

31. Esken CA. Weary at work: a conservation of resources approach to understanding job-related boredom [dissertation]. Baton Rouge, LA: Louisiana State University; 2018.

32. Lee TW. Toward the development and validation of a measure of job boredom. Manhattan College Journal of Business. 1986; 15: 22-8.

33. Ayough A, Zandieh M, Farsijani H. GA and ICA approaches to job rotation scheduling problem: considering employee's boredom. Int J Adv Manuf Technol. 2012; 60(5–8): 651-66.

34. Azizi N. Manufacturing productivity improvement: a study of human boredom, job rotation and scheduling [dissertation]. Ottawa, Canada: University of Ottawa; 2009.

35. Azizi N, Zolfaghari S, Liang M. Modeling job rotation in manufacturing systems: the study of employee's boredom and skill variations. Int J Prod Econ. 2010; 123(1): 69-85.

36. Azizi N, Liang M, Zolfaghari S. Modelling human boredom at work: mathematical formulations and a probabilistic framework. JMTM. 2013; 24(5): 711-46.

37. Cleary M, Sayers J, Lopez V, Hungerford C. Boredom in the workplace: reasons, impact, and solutions. Issues Ment Health Nurs. 2016; 37(2): 83-9.

38. Eid M. Predictors of job boredom [dissertation]. Orlando, FL: University of Central Florida; 2018.

39. Harju LK, Hakanen JJ, Schaufeli WB. Can job crafting reduce job boredom and increase work engagement? A three-year cross-lagged panel study. J Vocat Behav. 2016; 95: 11-20.

40. Harju LK, Schaufeli WB, Hakanen JJ. A multilevel study on servant leadership, job boredom and job crafting. J Manag Psychol. 2018; 33(1): 2-14.

41. Jahandideh S. Job scheduling considering both mental fatigue and boredom [dissertation]. Ottawa, Canada: University of Ottawa; 2012.

42. Loukidou L, Loan-Clarke J, Daniels K. Boredom in the workplace: more than monotonous tasks. Int J Manag Rev. 2009; 11(4): 381-405.

43. Mael F, Jex S. Workplace boredom: an integrative model of traditional and contemporary approaches. Group Organ Manag. 2015; 40(2): 131-59.

44. Mann S. Boredom at the checkout causes, coping strategies and outcomes of workplace boredom in a supermarket setting. JBRMR. 2012; 6(2): 1-14.

45. Oprea B, Iliescu D, Burtăverde V, Dumitrache M. Personality and boredom at work: the mediating role of job crafting. Career Dev Int. 2019; 24(4): 315-30.

46. Pindek S, Krajcevska A, Spector PE. Cyberloafing as a coping mechanism: dealing with workplace boredom. Comp Hum Behav. 2018; 86: 147-52.

47. Tsai CJ. Boredom at work and job monotony: an exploratory case study within the catering sector. Hum Resour Dev Q. 2016; 27(2): 207-36.

48. Van der Heijden GA, Schepers JJ, Nijssen EJ. Understanding workplace boredom among white collar employees: temporary reactions and individual differences. Eur J Work Organ Psy. 2012; 21(3): 349-75.

49. Whiteoak JW. Predicting boredom-coping at work. Pers Rev. 2014; 43(5): 741-63.

50. Kwon JO, Kang JM. Effect of perception of patient safety culture, job boredom and job crafting on safety compliance of hospital workers. Korean J Heal Serv Manag. 2020; 14(1): 1-14.

51. Loukidou E. Boredom in the workplace: a qualitative study of psychiatric nurses in Greece [dissertation]. Loughborough: Loughborough University; 2008.

52. Ros Velasco J. Well-being and prevention of boredom in older adults: a systematic review. Health, Aging & End of Life. 2021, in press.

53. Rawlins JM, Spencer M. Daughters and wives as informal care givers of the chronically ill elderly in Trinidad. J Comp Fam Stud. 2002; 33(1): 125-37.

54. Akter N. Managing caregiver boredom. 2021 May 19 [cited 2021 Nov 9]. In: Seniors Matter [Internet]. Available from: https://www.seniorsmatter.com/managing-caregiver-boredom/2491894

55. Popli UK, Panday R. Health problems of caregivers of hospitalized elderly. J Psychosoc Res. 2017; 12(2): 355-62.

56. Popli UK, Panday R. Caregivers burden of hospitalized elderly. JGGR. 2018; 7(5): 1-5.

57. Tamdee D, Tamdee P, Greiner C, Boonchiang W, Okamoto N, Isowa T. Conditions of caring for the elderly and family caregiver stress in Chiang Mai, Thailand. J Health Res. 2019; 33(2): 138-50.

58. Jacobs B. What to do about boredom as a caregiver. 2018 Oct 2 [cited 2021 Nov 9]. In AARP [Internet]. Available from: https://www.aarp.org/caregiving/life-balance/info-2018/tips-for-caregiver-boredom.html

59. Woodford J, Farrand P, Watkins ER, Llewellyn DJ. "I don't believe in leading a life of my own, I lead his life": a qualitative investigation of difficulties experienced by informal caregivers of stroke survivors experiencing depressive and anxious symptoms. Clin Gerontol. 2018; 41(4): 293-307.

60. Schempp D. Emotional side of caregiving. 2014 [cited 2021 Nov 9]. In: Family Caregiver Alliance [Internet]. Available from: https://www.caregiver.org/emotional-side-caregiving

61. Bronwyn I. Caregiver boredom: 24 hours either too much or too little. 2019 Jul [cited 2020 Aug 24]. In: PsychCentral [Internet]. Available from: https://blogs.psychcentral.com/full-heart/2019/07/caregiver-boredom-24-hours-either-too-much-or-too-little/

62. NeedHelpWithMom, Caringfor1, NewGirl. How should I handle boredom? 2019 Mar [cited 2021 Nov 9]. In: AgingCare [Internet]. Available from: https://www.agingcare.com/questions/how-should-i-handle-boredom-447267

63. Colin Reid R, Stajduhar KI, Chappell, NL. The impact of work interferences on family caregiver outcomes. J Appl Gerontol. 2010; 29(3): 267-89.

64. Hossain MA, Ahmed DT. A human caregiver support system in elderly monitoring facility. In: IEEE Xplore, editor. 2012 IEEE. IEEE Xplore; 2012, p. 435-40.

65. Rodstein M. Challenging residents to assume maximal responsibilities in homes for the aged. J Am Geriatr Soc. 1975; 23(7): 317-21.

66. Cohen-Mansfield J. Stress in nursing home staff: a review and a theoretical model. J Appl Gerontol. 1995; 14(4): 444-66.

67. Hsu HC, Kung YW, Huang HC, Ho PY, Lin YY, Chen WS. Work stress among nursing home care attendants in Taiwan: a questionnaire survey. Int J Nurs Stud. 2007; 44(5): 736-46.

68. Scharlach AE. Caregiving and employment: competing or complementary roles? Gerontologist. 1994; 34(3): 378-85.

69. Åström S, Norberg A, Nilsson M, Winblad B. Tedium among personnel working with geriatric patients. Scand J Caring Sci. 1987; 1(3-4): 125-32.

70. Rausch L. A new approach to retain certified nursing assistants in nursing homes [dissertation]. St. Cloud, MN: St. Cloud State University; 2016.

71. Raffaelli Q, Mills C, Christoff K. The knowns and unknowns of boredom: a review of the literature. Exp Brain Res. 2018; 236(9): 2451-62.

72. Troutwine R, O'Neal EC. Volition, performance of a boring task and time estimation. Percept Mot Skills. 1981; 52(3): 865-6..

73. Deci EL, Ryan RM. The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. Psychol Inq. 2000; 11(4): 227-68.

74. Johnsen R. Boredom and organization studies. Organ Stud. 2016; 37(10): 1403-15.

75. Fleming P, Spicer A. Working from a cynical distance: implications for power, subjectivity and resistance. Organization. 2003; 10(1): 159-81.

76. Thomas C, Du Toit SHJ, Van Heerden SM. Leadership: the key to person-centred care. S Afr J Occup Ther. 2014; 44(3): 34-9.

77. The Eden Alternative. Eden Alternative data. From 1999 to 2005. 1999-2005 [cited 2021 Nov 9]. The Eden Alternative [Internet]. Available from: https://www.edenalt.org/wp-content/uploads/2009/06/eden_alternative_data_4.09.pdf

78. Wylie R. Impact of the Eden Alternative™ on Texas nursing homes residents' quality of life: a psychosocial perspective. San Marcos, TX: Texas State University; 2001.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Research

Trust between physicians and older patients: review and qualitative study

Brajaballav Kar, Soumyakanta Satpathy

Abstract

Background: Trust plays an important role in a medical encounter. Arguably, older patients being more vulnerable would need higher levels of trust. Research has indicated that trust is influenced by age; but, sparse research focus is available in the older adult context. **Objective:** It was intended to understand the status of extant research, and identify future research directions on the issue. **Method:** Articles published in the last decade was curated from the Scopus database and a structured literature review identified appropriate constructs and their linkages. Secondly, a group discussion was conducted among older adults and doctors. **Results:** The review identified 6 broad factors (prior trust, clinical setting, outcome, enablers-barriers, moderators, and information-knowledge). A broad recursive model of trust interaction was proposed include community trust, transfer of trust, trust in the transaction, and outcome. Doctor's behavior, cost incurred, and outcome were primary enablers of trust. Patients' desire to express themselves and time constraints are barriers to the trust. Blind or excessive trust in physicians can be costly and an inability to evaluate information objectively. The use of technology and the ability of patients to understand its implications are a significant bottleneck in the older adult context. Trust being implicit and information dependent, has to be signaled in the process**. Conclusion:** Age influences trust factors. Physical frailty, susceptibility, knowledge and information gap among elder patients affect trust in physicians. However, how these generic factors are moderated by age requires nuanced investigation. Theoretical advances can also explain how trust is to be communicated, understood, and reciprocated in medical encounters, or in services settings in general.

Key words

apriori, conflict, older adults, outcome, transaction, trust

Introduction

Trust is defined as one's intention to accept vulnerability based on the positive intention of another.[1] Specific trust and general trust are discussed in reference to doctors and health institutions.[2] The patient who is the trustor, is vulnerable to the provider, the trustee.[3]

Unlike physical sciences, trust plays a major role in medical science and is still being debated. Trust improves medication adherence,[4,5] health outcomes,[6] reduces risk perception,[7] and reduces anxiety and frequency of consultation.[8]

Mistrust, as the opposite of trust is, also being actively investigated in the medical literature. The exploitation of patients and the resulting mistrust is acknowledged.[9] Healthcare profit motives influence the cost of care and reduces trust.[10] A study reported institutional betrayal by 67 percent of the participants and predicted their disengagement from health care.[11] Massive erosion of trust in healthcare institutions also has been noted in many low- and middle-income countries including India.[12] Increased number of investigations have also been attributed to the lack of trust.[13] Bribe to doctors indicates an attempt to gain interpersonal trust.[14] Some have argued that the violence against the medical system, including doctors, is due to mistrust.[15] Physicians' income structure also contributes to the creation of mistrust.[16,17] Patients withhold information, portray doctors as insensitive, claim the medical system as exploitative, and threaten healthcare agents with law enforcement due to the lack of trust.[18] Competence and suspicion accounted for 40 percent of the variance on the Medical Mistrust Index.[19] Operational issues such as a higher waiting time to get an appointment reduced trust.[20]

Factors of trust

Doctors' interpersonal behaviours and technical competence create a positive reputation in the community which reputation shapes initial trust of a patient even before a physical encounter. Doctors' social media behaviour also influences the trust of patients.[21] During the encounter, good customer care, understanding and sympathy shape trustworthiness. Doctors' technical competence and professionalism shapes trust during and after an encounter.[22,23] Increase in trust significantly depends on patient-centred communication skills.[24] The trustworthiness in the doctor-patient interaction involves the authoritative and affection dimensions.[25] Further to the interaction, the trust depends on medical service quality and service satisfaction as well; the latter two factors were sequential mediators between communication and trust.[26]

However, over a period, trustworthiness is enhanced when doctors connect with the patients beyond organisational boundary or professional jurisdiction.[23] Demonstration of empathy, kindness, and approachability are some measures to establish trust.[6] Clinical empathy involves cognitive understanding and affective resonance. Both these can be related to trust between the dyad. However, some argue that the affective resonance is a liability.[27]

Objectives

Given the higher vulnerability of older adults, demographic change, cost of treatment, and emotional status, a review and a qualitative inquiry was necessary to assess the state of research in this particular area. This research intended to identify factors associated with the extant research on trust between older patients and physicians for the last decade from the Scopus database and assess it with a focus group discussion.

Methodology

A structured literature review approach was taken to understand the existing status of research on the theme. A focus group discussion on trust between patients and doctors was conducted on a virtual platform. A meeting of the Geriatric Care and Research Organisation provided the forum for discussion where older adults and doctors were participants. The participants were from the United Kingdom and India. The discussion took place on 3rd Oct 2021, 2.30 PM to 4.15 PM IST.

A list of literature was curated from Scopus Database with the following query criteria: Keywords (doctor, trust, older adult, patient), document publication year (from 2012-2021, 10 years), document type (article), language (English), and source type (journal). The query resulted in 134 articles. Word-cloud was created from these article texts by VOSviewer. After an initial review, only relevant articles were included.

Results

This section presents results of the specific review on trust and older adults from the article curated. Older adults experience higher medication- related problems, feel vulnerable during hospital discharge, and reduced capability to comprehend information.[28] Trust increases hope among older patients.[29] Trust between patients and doctors is dyadic, reciprocal, and depends on the quality of communication.[30] Physicians' availability, time, and attention reinforce confidence and trust whereas, misdiagnoses and poor communication style hinder it.[31]

Trust has a demography dimension. Age and communication are determinants of trust.[32] Interestingly, the trust of the physician in the patient is also significantly and positively correlated with the physician's age and income, but negatively with the physician's education.[33] Humanistic doctors display deep connections, maintain personal and professional relationships with patients.[34] Older adults in general and with lower income in particular feel that the doctors do not care.[35] Social factors affect the initial trust of patients in the physician through their trust in the hospital. The reputation and recommendation also affect the initial trust.[36]

Trust is also influenced by existing health conditions. The low level of trust in doctors among older adults, was influenced by poor health status and poor quality of life.[37] Conversely, older adults with unmet health care needs and lack of trust in physicians were more likely having poor health status.[38] Older adults with a fewer chronic health conditions and those who adhered to physical activity demonstrate significantly higher trust.[39] Significant and positive dental care experience was reported by persons of age 75 and above.[40] Older adults avoid medical care because they feel uncomfortable for body examination, fear of a serious illness, and thought of dying.[41]

The trust also improves therapeutic alliance and its lack causes abandonment among older adults.[42] Research reported 2 percent lower risk of depressive symptoms, for every one-point increase in trust in physicians and the decrease was 25 percent for an improvement of the score over 2 years.[43]

Lack of trust reduces the persistence of medicine use,[44] promotes home remedy usage.[45] Mistrust pushes patients to take up secret self-management among older adults.[46] Trust in physicians also influenced the use of complementary therapies (home remedies, foods and supplements, over-the-counter (OTC) drug use, prayer, exercise, and being more active) among older adults.[47]

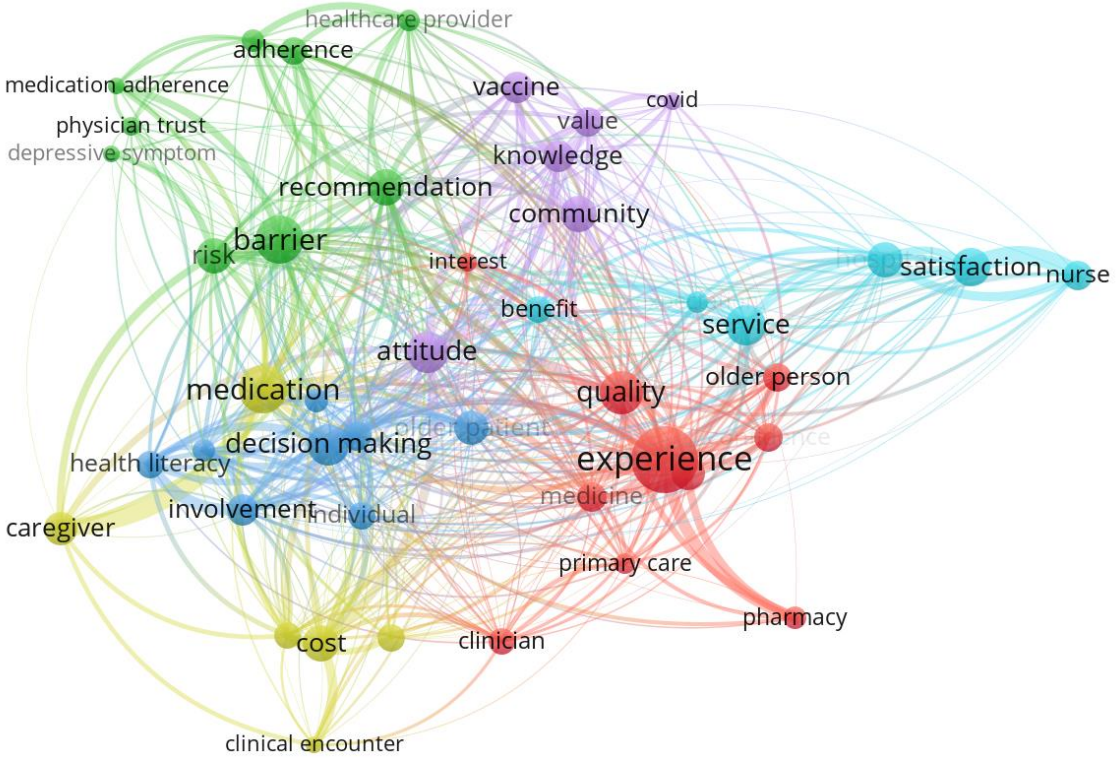
Theory related to trust between patients and physicians

A meta-synthesis of qualitative studies has indicated attachment theory as the basis of physician-patient relationship.[48] The feeling of safety in a distress situation, physician-patient transaction as an opportunity for the development of attachment, and the quality caregiving forms the basis of the attachment. However, to understand the degree of the trustworthiness established, researchers have used the signalling theory (ST).[49] Trust is not observable thus, has to be signalled. This theory is usually applied to situations of uncertainty and asymmetry of information. In a therapeutic setting, a decision is made where patients and physicians have different levels of information.

Network visualization in VOSviewer: The articles curated (n=134) from Scopus databases were selected for network visualization analysis of keywords. The label and circle size depends on the weight of the keywords among the articles; a higher weight is indicated by a larger label and circle size. Color represents the cluster and line is the link between the keywords. The clustering technique is based on citations.[50]

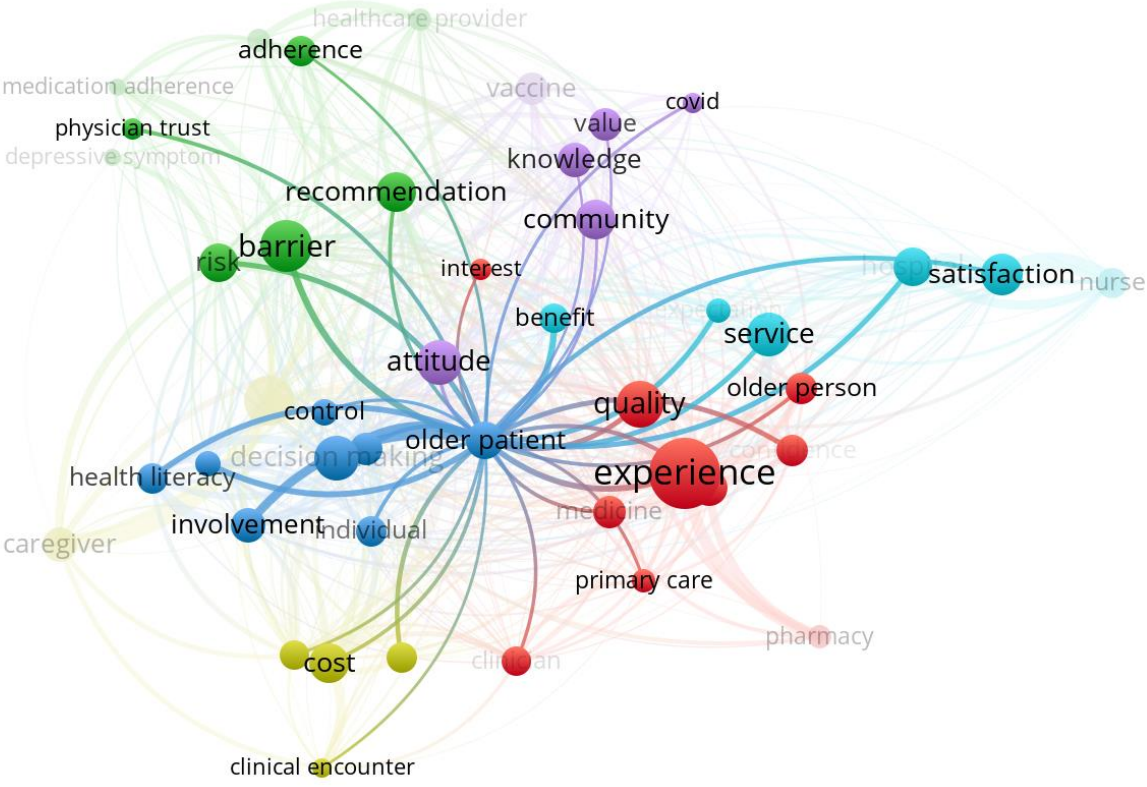
The following Figures 1-3 presents the VOSViwer maps overall (Figure-1), with older patients as the node (Figure-2), and with older person as the node (Figure-3).

Figure 1: Network map of articles



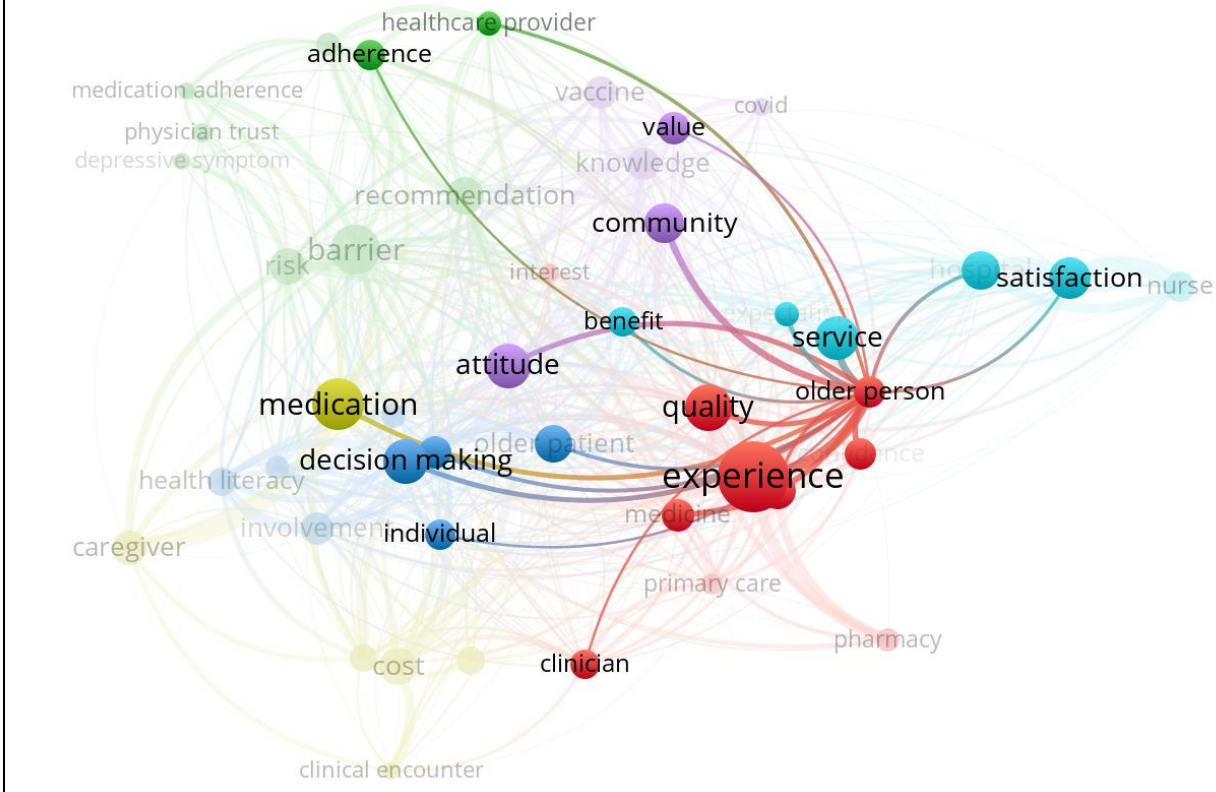
Note: VOSViewer Network map of keywords from article curated from Scopus database

Figure 2: Network map with older patient as the node



Note: VOSViewer Network map of keywords from article curated from Scopus database

Figure 3: Network map with older person as the node



Note: VOSViewer Network map of keywords from article curated from Scopus database

Table 1: Clusters and naming

Cluster Number	Cluster words	Name
1	clinician, confidence, experience, interest, medicine, perception, pharmacy, primary care, quality	Clinical setting
2	adherence, barrier, depressive symptoms, discrimination, healthcare provider, medication adherence, trust, recommendation, risk	Barrier enablers
3	control, decision making, healthcare, health literacy, individual, involvement, treatment decision	Health knowledge
4	caregiver, clinical encounter, cost, health information, medication, willingness	Moderators
5	attitude, community, knowledge, value	Human factors
6	benefit, expectation, hospital, nurse, satisfaction, service	Outcome

The software identified six keyword clusters (Table 1); we provided a group name for these clusters based on the concepts. As indicated in the network diagrams, the peripheral words such as nurse, pharmacy, clinical encounter, caregiver, physician trust are few promising research areas to develop a comprehensive understanding of trust in older adult context.

Focus group discussion

The moderator introduced the topic and invited responses on the issue. Specific texts used by the participants are indicated within the quotation mark.

Trust was acknowledged to be important in the therapeutic process. The placebo therapy is a proxy for trust. Trust is dyadic and doctors take the oath to maintain such trust. Doctors, patients, and systems were identified as the agents involved in the trust-built-up process. The saying about the doctor 'has a good hand' indicates that the doctor can put the patient at ease through communication with patients. It was also pointed out that 'doctors make conscious effort to establish trust.' Two trust factors, 'investigate appropriately, and will not make the patient spend extra' were explicitly spelt out.

A-Priori trust: In case of medical need, the patients have to decide which doctor to visit. The information search is based on 'location and specialization.' Patients try to identify acquaintances who experienced the particular doctor and understand their experiences. Primarily, the patients try to understand 'behavior, satisfaction, and cost' aspects from others. Search for information is usually need-driven and by the patients individually.

However, 'illiterate and elderly depend on others in this process. The 'urban and retired elderly invest their effort in addition to the word of mouth experience.' The patients visit a particular doctor 'with a particular level of prior trust.' The information seeking is not only the initial behavior; it occurs continually and usually an urban elderly decides to 'visit, continue or discontinue consultation as well as prescribed medication' based on information.

Transactional trust: During the process of consultation, the trust factors were indicated to be 'listen to the patient with attention, with patience, for adequate time, and prescribe less costly medicine.' A participant observed that a few doctors prescribe 'without hearing the patient adequately.' Patients are left with an unfulfilled desire 'to express about their problems adequately.' The participant wondered if such practice indicates 'an ulterior motive to earn money' and subsequently commented that such a feeling with the patient 'gives rise to a perception that the medicine does not work.' A doctor responded 'some doctors may be very experienced to understand problems after a very brief interaction.' He further advised 'online consultation can remove some of the challenges of waiting time and brief consultation because the patient pays for the doctor's time. Further, the queue is not visible in an online consultation.' Another doctor suggested 'patients need not travel long distance and wait long hours if they can avail the same treatment locally'. Medical literacy of patients can save time and cost, instead of searching 'good doctor.' In this sense the trust is expensive.

Appearance-based inferences and the caring inclination of the health care provider indicate that the inclination is lower for untrustworthy-looking faces. However, this bias is less for an expert compared to novice healthcare providers.[51] Patients also display some bias. Though there is a preference for full disclosure in general, a few choose to remain deliberately ill-informed to avoid distress.[31]

A refrain was verbalized as 'the doctor should not experiment on the patient'. The trust factors were further elaborated as 'the patients should not have to visit multiple times.' Trust, as certainty and early recovery, was indicated in the statements.

The mistrust factors were identified as a perception that 'the patients are exploited in corporate hospitals and doctors in such hospitals work with targets.' Another comment was that 'except psychiatrists, other doctors are not ready to counsel patients.'

Conflict in trust: The experience of elderly patients and young doctors indicated an implicit conflict. Young doctors are likely to have more information and be technology savvy. The conflict was expressed as 'doctors can have an ego that we know and the patient need not know.' It was also elaborated as 'explaining the medicine, process, and equipment helps increasing the knowledge of patients and can contribute to the cure to the extent of 25 percent.' The contrary argument was furthered that some patients come with 'overload of information from Google search, waste doctor's time, and it is nuisance in a busy clinic.' Extant literature suggests that interpreting a multitude information from various internet sources for patients is emerging as an important function for physicians.[24] Prior information search from the internet also creates resistance to advise and hinders medical autonomy.[52]

Blind trust: A very high degree of trust on doctors was termed as 'blind trust.' Blind trust in a specific doctor prompts the patients 'to blame themselves or their fate, in case of undesirable or adverse outcomes.' However, a doctor participant indicated 'the trust should be based on objective evaluation, usually known as second-opinion. The medication literacy needs to improve through awareness.' Further, it was suggested that the patients should 'have a higher ability to handle reality. The patients should not 'anticipate false assurance from doctors, a practice more prevalent in India.' It was also acknowledged that 'the doctors have this soft-skill deficit to communicate an unfavorable message.' Participants expressed the need for the doctors to be extra sensitive to elderly patients.

Model development

Many observations of this discussion concurred with existing literature. Trust is not automatic in medical care. Emphasizing the patient's lifeworld in a professional caring relationship enables the patient to trust the caregiver and the healthcare system; the "voice of the lifeworld" enables patients to feel the trust.[53] A study identified factors of trust as "added insult of ageism," "alternative remedies," "good providers in a broken system," and "person recognition".[54]

The doctor Google phenomena indicate the role of information in trust. Study has argued that in a multi-stakeholder context the focus of trust needs to shift from affect-based to cognition-based.[55] A complaint analysis indicate patients to be inexpert, distressed, or with a motive to seek advantage.[56]

While acknowledging the lack of policies and budget constraints, research has argued the need for guidelines and policies for elderly-friendly hospitals. The hospital environment, health card of senior citizens, and advocacy for elderly health are some of the common expectations of older patients.[57] Figure 4 below proposes a trust multi-stage recursive model based on the discussion.

Discussion

The review and discussion indicated that the patient's trust in the physician has complex interaction of various factors. The broad model developed from the group discussion can be further enhanced by factors identified from the literature. Apriori factors of trust (attitude, community, knowledge, and value), outcome basis of trust (benefit, expectation, satisfaction, and services), moderators of trust (caregiver, clinical encounter, cost, information, medication, and willingness), knowledge and information factors (health literacy, involvement,

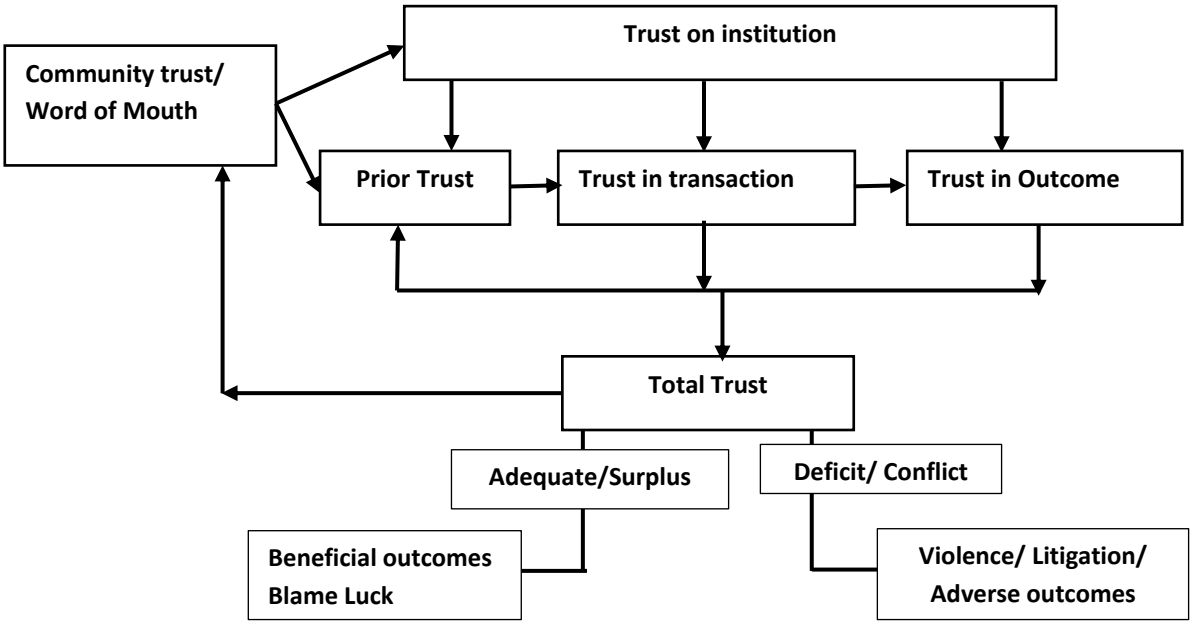
treatment decision, control, and decision), barriers and enabling factors (depressive symptoms, discrimination, adherence, medication adherence, trust, recommendation, risk and healthcare service provider) and the clinical setting related factors (clinician, expertise, experience, pharmacy, primary care, and quality) can be modelled.

The focus group discussion indicated a trust transfer or build-up process when a new patient search for information to decide the doctors to visit. Interactions during visits and outcomes subsequently influence the trust. However, it is also pointed out that trust can influence the outcome pointing out the bi-directionality. Isolating a cause and effect relationship between trust and outcome, and assessing the extent to which one influenced the other becomes complex. The variation from distrust to blind-trust suggests an optimal level of trust for a beneficial outcome.

Information plays a substantial role in trust. Information asymmetry between the doctors and patients and subsequent efforts to bridge the gap are subjected to constraints of time, willingness, and technology. Patients with extensive unrelated information from the internet seeking an explanation and the need for doctors' responsiveness indicate a role of health education and its influence on trust during medical encounters.

The perceived profit motive of health care service providers and trust presents an inherent dichotomy. The duration of treatment, information, cost, and outcome can be hypothesized as moderators between these two. Cost as an indicator of service quality can also be related to trust.

Figure 4: Trust interaction model developed from the discussion



Limitations

The focus group discussion was conducted along with the seminar conducted by the organization. The participants were invited by the organization and it was not controlled for this specific research objective; the demography of participants and doctors were mixed. Secondly, the time was limited for an exhaustive discussion where thematic saturation could be claimed.

Conclusion

We intended to identify factors of patients' trust in physicians in older adult context from a systematic literature review and group discussion. Trust can be categorised as prior trust, trust in transactions, and outcomes. Related factors were identified as attitude, community, knowledge, value, benefit, expectation, satisfaction, caregiver, service providers, clinical encounter, cost, information, medication, willingness, health literacy, involvement, treatment decision, adherence, control, discrimination, recommendation, risk, clinician, expertise, experience, and quality.

Though the variation of trust with age is acknowledged, research specific to older patient context is scarce. Trust factors are expected to be independent of age, but their levels and interactions creating trust specific to older patients have scope for further research. Secondly, the assessment of trust prior, during, or post-treatment, is a methodological issue influencing the course of treatment as well as necessary interventions. Research understanding can protect healthcare agents and institutions from adverse effects of mistrust. Though the trust research primarily focuses on physicians, it applies to everyone involved in the service delivery and healthcare as a system.

Acknowledgement

This research was a part of the ICSSR Project: Social Trust, SERVQUAL Model, & Service Consumption: A COVID-19 Study, F.No: COVID/172/47/2020-21/ICSSR, Date 01-03-2021.

Authors acknowledge the support extended to conduct the group discussion on GeriCaRe platform.

Author information: Brajaballav Kar, B.Tech, PGDM, Ph.D. Associate Professor Technology and Operations Management, School of Management, KIIT University, Bhubaneswar, India; Email: brajkar@gmail.com; ORCID: 0000-0002-2127-1147; **Soumyakanta Satpathy**, PGDPT, MBA (HRM), General Manager Operations, Kalinga Institute of Medical Sciences, KIIT University, Bhubaneswar, India, Email: ssatpathy@kims.ac.in

Correspondence: Brajaballav Kar, B.Tech, PGDM, Ph.D. Associate Professor Technology and Operations Management, School of Management, KIIT University, Bhubaneswar, India; Email: brajkar@gmail.com;

Competing interests: None

Received: 11 October 2021**; Revised:** 27 November 2021**; Accepted:** 27 November 2021

Citation: Kar B, Satpathy S. Trust between physicians and older patients: review and qualitative study. Journal of Geriatric Care and Research, 2021, 8, 2: 56-64.

References

1. Rousseau DM, Sitkin SB, Burt RS, Camerer C. Not so different after all: A cross-discipline view of trust. Academy of Management Review. 1998; 23(3): 393-404.
2. Holland S, Stocks D. Trust and Its Role in the Medical Encounter. Health Care Analysis. 2017; 25(3): 260-74..
3. Buchman DZ, Ho A, Goldberg DS. Investigating trust, expertise, and epistemic injustice in chronic pain. Journal of Bioethical Inquiry. 2017;14(1): 31-42.
4. Pugh M, Perrin PB, Rybarczyk B, Tan J. Racism, mental health, healthcare provider trust, and medication adherence among black patients in safety-net primary care. Journal of Clinical Psychology in Medical Settings. 2021; 28(1): 181-90.
5. Linsky A, Simon SR, Stolzmann K, Meterko M. Patient attitudes and experiences that predict medication discontinuation in the Veterans Health Administration. Journal of the American Pharmacists Association. 2018; 58(1): 13-20.
6. Duckett K. Behind the mask: new challenges to gaining patient trust. Home Healthcare Now. 2020; 38(6): 327-330.
7. Wei D, Xu A, Wu X. The mediating effect of trust on the relationship between doctor–patient communication and patients' risk perception during treatment. PsyCh journal. 2020; 9(3): 383-391.
8. Netemeyer RG, Dobolyi DG, Abbasi A, Clifford G, Taylor H. Health literacy, health numeracy, and Trust in Doctor: effects on key patient health outcomes. Journal of Consumer Affairs. 2020; 54(1): 3-42.
9. Sullivan LS. Trust, risk, and race in American medicine. Hastings Center Report. 2020; 50(1): 18-26.
10. Richmond J, Powell W, Maurer M, Mangrum R, Gold MR, Pathak-Sen E, Yang M, Carman KL. Public mistrust of the US health care system's profit motives: mixed-methods results from a randomized controlled trial. Journal of general internal medicine. 2017; 32(12): 1396-1402.
11. Smith CP. First, do no harm: institutional betrayal and trust in health care organizations. Journal of multidisciplinary healthcare. 2017; 10: 133-144.
12. Kane S, Calnan M. Erosion of trust in the medical profession in India: time for doctors to act. International journal of health policy and management. 2017; 6(1): 5-8.
13. Fritz Z, Holton R. Too much medicine: Not enough trust? J Med Ethics 2019; 45: 31–35.
14. Chan CS, Yao Z. A market of distrust: toward a cultural sociology of unofficial exchanges between patients and doctors in China. Theory and Society. 2018; 47(6): 737-772..
15. Zhang L, Stone TE, Zhang J. Understanding the rise of Yinao in China: a commentary on the little known phenomenon of healthcare violence. Nursing & health sciences. 2017; 19(2): 183-187.
16. Chan CS. Mistrust of physicians in China: society, institution, and interaction as root causes. Developing World Bioethics. 2018; 18(1): 16-25.
17. Sperling D. (Re) disclosing physician financial interests: rebuilding trust or making unreasonable burdens on physicians?. Medicine, Health Care and Philosophy. 2017; 20(2): 179-186.
18. Uibu M. "Doctors Just Don't Care about People!" How Medical Specialists Are Depicted in a Vaccine-Critical Estonian Facebook Group. Folklore: Electronic Journal of Folklore. 2021; (82): 215-238.
19. Sheppard VB, Huei-Yu Wang J, Hurtado-de-Mendoza A, Sutton AL, LaVeist TA. Psychometric properties of the medical mistrust index (MMI) in Latina immigrants. Behavioral Medicine. 2019; 45(2): 128-133.
20. Nguyen AL, Schwei RJ, Zhao YQ, Rathouz PJ, Jacobs EA. What Matters When It Comes to Trust in One's Physician: Race/Ethnicity, Sociodemographic Factors, and/or Access to and Experiences with Health Care?. Health equity. 2020; 4(1): 280–289.
21. Fatollahi JJ, Colbert JA, Agarwal P, Lee JL, Lehmann EY, Yuan N, Lehmann LS, Chretien KC. The impact of physician social media behavior on patient trust. AJOB empirical bioethics. 2020; 11(2): 77-82.
22. Isangula KG, Seale H, Jayasuriya R, Nyamhanga TM, Stephenson N. What factors shape doctors'

trustworthiness? Patients' perspectives in the context of hypertension care in rural Tanzania. Rural and Remote Health. 2020; 20(3): 5826-5836.

23. Vale MD, Good MJ. Transcending the profession: psychiatric patients' experiences of trust in clinicians. Journal of health and social behavior. 2020; 61(2): 208-222.

24. Asan O, Yu Z, Crotty BH. How clinician-patient communication affects trust in health information sources: Temporal trends from a national cross-sectional survey. Plos one. 2021; 16(2): e0247583.

25. Zhao X, Mao Y. Trust me, I am a doctor: discourse of trustworthiness by Chinese doctors in online medical consultation. Health communication. 2021; 36(3): 372-380.

26. Du L, Xu J, Chen X, Zhu X, Zhang Y, Wu R, Ji H, Zhou L. Rebuild doctor–patient trust in medical service delivery in China. Scientific Reports. 2020; 10(1): 1–11.

27. Schwan D. Should physicians be empathetic? Rethinking clinical empathy. Theoretical medicine and bioethics. 2018; 39(5): 347-360.

28. Parekh N, Gahagan B, Ward L, Ali K. 'They must help if the doctor gives them to you': a qualitative study of the older person's lived experience of medication-related problems. Age and ageing. 2019; 48(1):147-151.

29. Tanco K, Rhondali W, Park M, Liu D, Bruera E. Predictors of trust in the medical profession among cancer patients receiving palliative care: a preliminary study. Journal of palliative medicine. 2016; 19(9): 991–994.

30. Petrocchi S, Iannello P, Lecciso F, Levante A, Antonietti A, Schulz PJ. Interpersonal trust in doctor-patient relation: Evidence from dyadic analysis and association with quality of dyadic communication. Social science & medicine. 2019; 235: 112391.

31. Evans N, Pasman HR, Payne SA, Seymour J, Pleschberger S, Deschepper R, Onwuteaka-Philipsen BD. Older patients' attitudes towards and experiences of patient-physician end-of-life communication: a secondary analysis of interviews from British, Dutch and Belgian patients. BMC palliative care. 2012; 11(1): 1–10.

32. Chandra S, Ward P, Mohammadnezhad M. Investigating Patient Trust in Doctors: A Cross-Sectional Survey of Out-Patient Departments in Fiji. International Quarterly of Community Health Education. 2021; 41(4): 369-377.

33. Sun J, Zhang L, Sun R, Jiang Y, Chen X, He C, Wei J. Exploring the influence of resiliency on physician trust in patients: An empirical study of Chinese incidents. PloS one. 2018; 13(12): e0207394.

34. Swendiman RA, Marcaccio CL, Han J, Hoffman DI, Weiner TM, Nance ML, Chou CM. Attitudes and habits of highly humanistic surgeons: a single-institution, mixed-methods study. Academic Medicine. 2019; 94(7): 1027-1032.

35. Kelly G, Mrengqwa L, Geffen L. "They don't care about us": older people's experiences of primary healthcare in Cape Town, South Africa. BMC geriatrics. 2019; 19(1): 1-14.

36. da Silva Terres M, Basso K. The art of building initial trust in medical services. International Journal of Pharmaceutical and Healthcare Marketing. 2018; 12(2): 94-112.

37. Simon MA, Zhang M, Dong X. Trust in physicians among US Chinese older adults. Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences. 2014; 69 (Suppl_2): S46-S53.

38. Muirhead VE, Marcenes W, Wright D. Do health provider–patient relationships matter? Exploring dentist-patient relationships and oral health-related quality of life in older people. Age and ageing. 2014; 43(3): 399-405.

39. Bell RA, Arcury TA, Ip E, Grzywacz JG, Nguyen H, Kirk JK, Saldana S, Quandt SA. Correlates of physician trust among rural older adults with diabetes. American journal of health behavior. 2013; 37(5): 660-666.

40. Dolce MC, Parker JL, Savageau JA, Da Silva JD. Older adult patients' experience of care in a dental school clinic. Journal of dental education. 2019; 83(9): 1039-1046.

41. Leyva B, Taber JM, Trivedi AN. Medical care avoidance among older adults. Journal of Applied Gerontology. 2020; 39(1): 74-85.

42. Portacolone E, Covinsky KE, Johnson JK, Halpern J. Expectations and concerns of older adults with cognitive impairment about their relationship with medical providers: A call for therapeutic alliances. Qualitative health research. 2020; 30 (10): 1584-1595.

43. Dong X, Bergren S, Simon MA. Cross-sectional and longitudinal association between trust in physician and depressive symptoms among US community-dwelling chinese older adults. The Journals of Gerontology: Series A. 2017; 72 (suppl_1): S125-S130.

44. Gillette C, Howerton DM, Williams BD, Mahmood MA. Medication persistence in older women with osteoporosis: a pilot study. Osteoporosis International. 2015; 26(12): 2883-2888.

45. Foster PP, Cuffee Y, Alwatban N, Minton M, Lewis DW, Allison J. Physician trust and home remedy use among low-income blacks and whites with hypertension: findings from the TRUST study. Journal of racial and ethnic health disparities. 2019; 6(4): 830-835.

46. Martinez-Hollingsworth A, Hamilton N, Choi K, Heilemann M. The Secret-Self Management Loop: A grounded theory of provider mistrust among older Latinas with type 2 diabetes and mental health symptoms. Diabetes Research and Clinical Practice. 2021; 175: 108787.

47. Arcury TA, Nguyen HT, Sandberg JC, Neiberg RH, Altizer KP, Bell RA, Grzywacz JG, Lang W, Quandt SA. Use of complementary therapies for health promotion among older adults. Journal of Applied Gerontology. 2015; 34(5): 552-572.

48. Guillemeney J, Clary B, Labadie-Fobis A, Engberink AO, Pavageau S. Attachment theory is a resource for the doctor-patient relationship: qualitative meta-synthesis. Annales Médico-psychologiques, revue psychiatrique. 2019; 177(4), 335-341.

49. Hampshire K, Hamill H, Mariwah S, Mwanga J, Amoako-Sakyi D. The application of signalling theory to health-related trust problems: the example of herbal clinics in Ghana and Tanzania. Social Science & Medicine. 2017; 188:109-118.

50. van Eck NJ, Waltman L. Citation-based clustering of publications using CitNetExplorer and VOSviewer. Scientometrics 2017; 111(2): 1053-1070.

51. Mattarozzi K, Colonnello V, De Gioia F, et al. I care, even after the first impression: Facial appearance-based evaluations in healthcare context. Soc Sci Med 2017; 182: 68-72.

52. Davis JK. Dr. Google and premature consent: patients who trust the internet more than they trust their provider. HEC Forum. 2018; 30, 253-265.

53. Norberg Boysen G, Nyström M, Christensson L, Herlitz J, Wireklint Sundström B. Trust in the early chain of healthcare: lifeworld hermeneutics from the patient's perspective. International journal of qualitative studies on health and well-being. 2017; 12(1): 1356674.

54. Hansen BR, Hodgson NA, Gitlin LN. It's a matter of trust: Older African Americans speak about their health care encounters. Journal of Applied Gerontology. 2016; 35(10): 1058-1076.

55. Rowe R, Calnan M. Trust relations in health care: developing a theoretical framework for the "new" NHS. Journal of Health Organization and Management. 2006; 20(5): 376-396.

56. Adams M, Maben J, Robert G. 'It's sometimes hard to tell what patients are playing at': How healthcare professionals make sense of why patients and families complain about care. Health. 2018; 22(6): 603-623.

57. Karki S, Bhatta DN, Aryal UR. Older people's perspectives on an elderly-friendly hospital environment: an exploratory study. Risk Manag Healthc Policy 2015; 8: 81-89.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Case Report

Dissociative motor disorder in an elderly female: a case report

Priya Parekh, Subhashish Bhatta

Abstract

Dissociative motor disorders commonly present in the young adult population, with a greater preponderance in females. We present the first probable known case of dissociative motor disorder in an elderly female, who presented to the psychiatric outpatient department with uncontrolled neck movements and gulping movements and sensations. We discuss the impact of psychological stress in dissociative motor disorder and our approach to management of this case, which includes psychotherapy, pharmacological therapy and social support.

Key words

Aged, dissociative motor disorder, psychological stress, psychotherapy

Introduction

Within ICD-10, dissociative motor disorders (DMD) are classified as a subtype of Dissociative [conversion] disorders and are characterised by loss of control of voluntary bodily movements as a result of a psychogenic origin.[1] The literature on the diagnosis and management of DMD is limited to multiple case reports and small trials.[2,3] Evidence portrays the mean age of onset of DMD in the adult population is between 26-39 years old.[4,5] In this article, we present a case of a 60-year-old female with DMD precipitated by acute on chronic psychological stress and traumatic life events.

Case Presentation

A 60-year-old Caucasian female presented with a 3-year history of head-locking movements and gulping sensations, which she attributed to a fall onto her neck in her bathroom. Her symptoms began 2 months after the fall, initially with the sensation of clicking in her neck and hearing snapping of her nerves during neck movements. These symptoms evolved to spontaneous neck locking in all directions for up to 19 hours. She also experienced uncontrollable and sporadic gulping and swallowing movements and sensations, mainly in the pattern of 3 and 4 gulps each time.

Stresses

The patient's mother passed away in the month prior to her fall. The patient's mother suffered from dementia in the terminal years of her life and the patient was a sole carer for her mother. She had previously reported significant traumas since early childhood. She reported experiences of penetrative sexual abuse from her father and grandfather and physical abuse (hitting and punching) and sexual abuse (groping and penetrative sex) from multiple partners until 30 years old. She continues to experience memories and flashbacks of these traumas.

Past medical history

She was referred to psychiatric services by her general practitioner for further management of depressive-like symptoms. The patient was known to psychiatric services for 25 years and had an established diagnosis of recurrent depressive disorder, borderline personality disorder and previous alcohol misuse disorder. Within the 25 years prior to her fall, she had a background of sciatica, temporomandibular disorder, cervicalgia, fibromyalgia and bilateral tennis and golfer's elbow.

Examination

Examination of her cranial nerves and motor and sensory function were normal. Neck examination revealed pain on the left paraspinal area up to the external occipital protuberance and limited bilateral flexion to 45 degrees from the standard anatomical position.[6]

Investigations

All bloods and electromyography were normal. Magnetic resonance imaging (MRI) of brain showed minor small vessel disease bilaterally in the cerebral hemispheres and no other significant intracranial pathology. MRI C-spine showed moderate multilevel spondylosis with a potential multilevel nerve root irritation at level C3/C4 to C5/C6. There was also moderately severe transverse foramina stenosis secondary to broad base disc protrusion and disc osteophytes. There was very little change when compared to an MRI C-spine dated 8 years previously. The patient was referred to a neurologist and a neurosurgeon, who suggested no further explanation or intervention from their respective fields.

Treatment

The patient took a combination of antidepressant (venlafaxine 150mg twice daily for 1 year, increased from 75mg OD for 15 years previously), analgesic medications (pregabalin 300 mg twice daily for 2 years, nortriptyline

100 mg once daily for 1 year and buprenorphine patch 15 micrograms per hour, every 72 hours for 1 year) and oral anxiolytic (5 mg diazepam when required, maximum 8 hourly for 2 years). She received psychological input via a community psychiatric nurse who supported her several times per week. She also received trauma and emotional regulation therapy from a clinical psychologist and clinical reviews from a psychiatrist in the community. She was reviewed in a pain clinic and commenced on the analgesic medication as described and in a physiotherapy clinic for further management of pain and mobility via graded neck and shoulder exercises.

Outcome

Despite medicinal and psychological treatment over 3 years, our patient's symptoms continued to persist with a significant impact on her quality of life. In recent clinical reviews, the frequency and duration of her neck-locking had further increased, and she reported worsened pain around her neck and shoulder girdle.

Discussion

There are multiple influencing factors which are associated with our patient's presentation. These factors include the longstanding past medical history of musculoskeletal issues, physical damage caused by the fall prior to symptomology and positive findings on MRI brain and MRI c-spine. However, these factors do not explain causation or the extent of the degree of loss of function for this patient. With reference to the ICD-10 diagnostic criteria, the clinical picture for this patient is indicative of DMD as she presents with uncontrolled neck movements, gulping movements and sensations following the accumulation of adverse life events on the background of abuse and trauma, which are strongly associated risk factors.[1,7] Furthermore, during psychological assessment and therapy, the patient showed evidence of suppression of distress and impaired emotional processing, which are common traits in conversion disorders.[4]

To our knowledge, there is no other comparable study or case report presenting the onset of DMD later in life. Our patient also has a longer duration of symptoms in comparison to other known DMD cases. Stone et al highlighted that DMD typically presents for around 9 months before signs of resolution.[5] Given our patient's background of co-morbidities, it is difficult to elicit whether her features of dissociation were pre-existent at an earlier age prior to her fall. However, one systematic review highlights that physical trauma does have a role to play in the development of DMDs. This is important as physical trauma is often undermined as a predisposing factor for DMD and must be more strongly considered (along with increased age of onset) for diagnosis in future.[8]

The evidence on the management of DMD is limited to multiple case reports and small trials. Therefore, management of DMD is predominantly unvaried to the management for conversion disorders overall, for which there is greater evidence for multi-disciplinary therapeutic intervention. Management of DMD involves pharmacological therapy, psychotherapy, occupational therapy and social support.[2,3] Our patient was managed by this multifactorial approach with psychotropic medication, appropriate specialist inputs, psychodynamic therapy by a clinical psychologist and community care by social services.

Despite our interventions, there has been little improvement and further evolution of symptoms in our patient's condition. One major limiting factor to our patient's recovery is her lack of insight for psychiatric causation of her symptoms. Furthermore, treatment failure in dissociative disorders mainly occurs when the primary gain or stressor is unidentified, which appears to be the case in our patient, who received psychiatric management years later following her adverse life events. The pre-existing medical comorbidities (such as cervicalgia and temporomandibular disorder) possibly delayed appropriate treatment for our patient as her symptoms may have been attributed to musculoskeletal issues in the initial stages of her DMD. Further poor response to treatment may have been exacerbated by her personality disorder and depression due to lack of motivation or understanding of DMD. A poor prognosis in DMD is associated with prolonged symptoms and psychiatric comorbidity, which are features in our patient's case.[9] Untreated, misdiagnosed or refractory DMD has often been reported to develop or overlap with increased incidence of neurological disease such as Parkinson's disease, multiple sclerosis and gait disorders. Although rate of misdiagnosis has decreased over time,[10,11] it remains important to exclude any evolving neurological or musculoskeletal diseases with extensive physical examination and neuroimaging, and to have a multidisciplinary approach to the presentations.

Conclusion

Given the complexity involved in established diagnoses of DMD, we hope that our case sets a precedent for clinicians to appropriately recognize and manage DMD in elderly populations. Furthermore, an integrated multiagency approach involving medical input, psychological management and social support will be required for long term management, as with our patient. Without early intervention, DMD may manifest to create further disability or symptom evolution, which stresses the importance of early diagnosis in such cases.

Acknowledgement

Our patient has given written informed consent for this case report.

Author information: Priya Parekh MBBS iBSc, Foundation Doctor, Black Country Healthcare NHS Foundation Trust, Penn Hospital, Wolverhampton, UK, WV4 5HN, Email: p.parekh1@nhs.net; **Subhashish Bhatta** MBChB, MRCPsych, Specialty Doctor, Black Country Healthcare NHS Foundation Trust, Penn Hospital, Wolverhampton, UK, WV4 5HN, Email: subhashish.bhatta@nhs.net

Correspondence: Subhashish Bhatta MBChB, MRCPsych, Specialty Doctor, Black Country Healthcare NHS Foundation Trust, Penn Hospital, Wolverhampton, UK, WV4 5HN, Email: subhashish.bhatta@nhs.net

Competing interests: None

Received: 29 November 2021; **Revised:** 23 December 2021; **Accepted:** 23 December 2021

Citation: Parekh P, Bhatta S. Dissociative motor disorder in an elderly female: a case report. Journal of Geriatric Care and Research, 2021, 8, 2: 65-67.

References

1 World Health Organisation. ICD-10: International statistical classification of diseases and related health problems. 5th ed. Geneva: : WHO 2016.

2 Stonnington CM, Barry JJ, Fisher RS. Conversion disorder. In: American Journal of Psychiatry. 2006; 163(9): 1510-1517.

3 Owens C, Dein S. Conversion disorder: The modern hysteria. Adv Psychiatr Treat. 2006; 12(2): 152-157.

4 Thapa R. Dissociative disorders: A study of clinico-demographic profile and associated stressors. J Psychiatr Assoc Nepal. 2014; 3(2): 25-30.

5 Stone J, Warlow C, Sharpe M. Functional weakness: Clues to mechanism from the nature of onset. J Neurol Neurosurg Psychiatry. 2012; 83: 67-69.

6 White TD, Folkens PA. ANATQMICAL TERMINQLQGY. In: The Human Bone Manual. Elsevier Academic Press, Amsterdam, 2005: p67.

7 Roelofs K, Keijsers GPJ, Hoogduin KAL, et al. Childhood abuse in patients with conversion disorder. Am J Psychiatry. 2002; 159(11): 1908-1913.

8 Stone J, Carson A, Aditya H, et al. The role of physical injury in motor and sensory conversion symptoms: A systematic and narrative review. J Psychosom Res. 2009; 66(5): 383-390.

9 Jith A, Narayanan D. Dissociative motor disorder. Indian J Psychol Med. 2017; 39(1): 99-101.

10 Nicholson TRJ, Stone J, Kanaan RAA. Conversion disorder: A problematic diagnosis. J. Neurol. Neurosurg. Psychiatry. 2011; 82(11): 1267-1273.

11 Stone J, Smyth R, Carson A, et al. Systematic review of misdiagnosis of conversion symptoms and 'hysteria'. Br. Med. J. 2005; 331(7523): 989-991.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Review

Alcohol use in older adults: a review of clinical concerns

Thanuja Vidyaratne, Tanay Maiti

Abstract

Background: Alcohol consumption and related health hazards have remained a matter of concern for older adults. Although the pattern of use varies across cultures and continents, the use/misuse and related complications have been reported more from the western populations. **Aims:** Primary objectives of this clinical review was to find out the health effects of alcohol in elderly, specially focussing on their cognition, and to explore appropriate assessment and management options in the aged population. **Method:** Relevant electronic databases were searched with key words like 'alcohol in elderly population', 'cognitive effects of alcohol' 'amnesic syndrome' etc. **Results:** The impact of alcohol on the cognition of the elderly, leading to amnesia and dementia, has been a major clinical issue, where prophylactic and rehabilitative approaches may be of some use. Alcohol use related complications in the elderly put a huge burden on the resources of primary health care, emergency care and mental health care services, besides the social services for their continued care and support in community. Persons with cognitive deficits secondary to alcohol have caregiving needs which are usually met by family caregivers and social systems, and some of them need care in nursing or care home environments. The social care needs for this vulnerable population are high and often complicates the whole situation. **Conclusion:** Alcohol has multiple deleterious effects on the health of elderly, which increases their care needs further. Most of these are preventable and efforts need to be taken at multiple levels to contain this escalating concern.

Key words

Aged, Alcohol, Cognition, Dementia, Dependence, Encephalopathy, Metabolism, Screening

Introduction

Alcohol related health hazards, particularly the brain damage and related effects on cognition and higher mental functions are extremely important when it comes to the elderly and their quality of living. This not only puts an extra burden on mental health care, but also hampers the public health and other clinical services. From a report covering 2002 to 2012, the number of patients over 60 admitted to hospitals in England with amnesic syndromes associated with alcohol use has risen by 140%, where it is 10% in the less than 60-year old group.[1,2] Alcohol abuse can also cause or worsen vascular and Alzheimer's dementia in an indirect way by increasing the already existing risk factors. However, more often alcohol abuse is forgotten as one of the predisposing factors for primary dementias.

Objectives

Alcohol use in elderly is a growing problem, however both awareness and appropriate attention for the same is still lacking in many parts of the world. Elderly people, because of the natural physiological progression, already live with a compromised health status especially in their cognition and higher mental function. Alcohol use, well known for its immediate and long term effect on cognitive functions, becomes more complex for the elderly population which needs detailed and critical discussion. Appropriate screening and management of alcohol use problems in the elderly is often critical and needs a skilful approach. In this clinical review, it was intended to discuss the effect of alcohol on the body and mind, especially in the elderly, and to reflect upon the assessment and management in a comprehensive way.

Methods

Electronic databases and relevant literature were searched with key words such as 'alcohol in elderly population', 'cognitive effects of alcohol' 'amnesic syndrome' etc. Available clinically relevant information is described here.

Results

Alcohol and its units

It is essential for the clinicians and carers to be aware of the amount of alcohol being consumed by a person. A standard unit of alcohol is equivalent to 8g of absolute alcohol. It can be a half a pint of beer, one glass of wine, one glass of sherry, or one measure of spirits. However, the strength of alcohol can vary for example one pint of beer can have an absolute alcohol content from 8g to 12g depending on the strength.[3] The amount of alcohol consumed gives an idea of degree of tolerance, probable intensity of the withdrawal symptoms and complications, and the treatment requirements.

Alcohol metabolism in body

Alcohol absorption occurs both in the stomach and the small intestine. This can be rapid when taken on an empty

stomach. Alcohol is distributed with body water, therefore reaches many tissues which have a higher amount of water, such as heart and the brain. In the body, the alcohol is metabolised to acetaldehyde which is a toxic substance. This is then metabolised to acetate which is non-toxic. The oxidation of excess alcohol gives rise to increased lactic acid, keto-acids and can cause retention of uric acid. It can also cause fatty liver and lipid abnormalities. Alcohol is metabolised by the liver. In persons using a lot of alcohol, at the beginning, the metabolism is faster; this occurs through enzyme induction. After some time, with damage to the liver cells, the liver may not be able to manage anymore, and liver failure begins. In liver failure, alcohol metabolism is impaired and alcohol level can remain for high more than 24 hours.[3]

Alcohol in brain

Alcohol can affect several parts of the brain. Being a small molecule, it easily crosses the blood brain barrier and contracts brain tissues, and destroys brain cells. It is a central nervous system depressant and interacts with the brain receptors, interfering with the neural communication suppressing excitatory nerve pathway activity. Neuro-cognitive deficits, neuronal injury, and neurodegeneration are well documented in heavy users of alcohol. Though, at present underlying mechanisms remain inconclusive, heavy drinking over a prolonged period of time can cause serious problems with cognition and memory.[4] Post-mortem studies have shown degeneration of white matter in chronic heavy alcohol users. There is a specific vulnerability of white matter to chronic alcohol exposure. Studies have demonstrated white-matter volume deficits as well as damage to selective grey-matter structures.[5]

Alcohol in old age: myths and hidden problems

There are many myths and misconceptions about drinking in old age; some examples are described here. Many people think that 'older people hardly drink'. However, although alcohol abuse is typically considered as a problem of youth; the fact is that nearly one third of the alcohol problems which occur in the elderly start in late age.[6,7]

The hesitancy about disclosing the individual's alcohol use is common: 'What will people/doctor think if I talk about my drinking habit?' Many elderly persons often do not disclose their drinking habits or underreport it as well.[8]

There is also a cultural inhibition occasionally noticed amongst professionals to ask about or screen for alcohol abuse from an elderly person, especially from an elderly female; although alcohol misuse in elderly females can have a prevalence of up to 8 percent, as per some community surveys.[9,10,11]

Most people only see a part of the complications related to alcohol use, e.g., they consider that people have more 'physical' comorbidities or complications of alcohol in old age. There is a difficulty in understanding alcohol as a root cause of other coexisting and commonly presenting medical problems like insomnia, confused state, irritable mood, and mental health problems, etc.

Alcohol, elderly and physical health

Significant pharmacokinetic and pharmacodynamics changes occur in old age and a different response to alcohol has been observed as well. In the elderly, body water and body mass decrease; and the slowed metabolism rate, decreased tolerance and higher sensitivity result in higher blood alcohol levels with minimal intake. All these factors increase the chance of intoxication. The higher and long-lasting blood alcohol level often unmasks various chronic illnesses in the elderly including a poor nutritional status. In an already compromised hepatic, renal, cardiac and immune status, the chance of medical complications increases, with a greater chance of accidents, falls and fractures leading to frequent visits to medical and emergency services.[12,13,14] In addition, cirrhosis of the liver and increased incidence of various cancers (like liver, esophagus, nasopharynx and colon) has been linked with elderly alcohol use.[14,15,16] In an elderly population, who are usually on various medications due to comorbidities and the habit of having more over-the-counter medications, the chance of drug interaction related complications increases further.[17,18]

Effects of alcohol on cognition in elderly

Aging is an automatic and physiological process towards neurodegeneration and cognitive declination. Poor working memory, slowed information processing, difficulties in planning, decision making and judgment (related to frontal lobe deficits) with possible difficulties in stored memory retrieval has been mentioned as a part of 'normal' aging with unchanged semantic memory or fluid intelligence.[19,20] It also known that the increased age is a recognized risk factor for both mild cognitive impairment and dementia.[21,22] While acute intake of moderate to large amount of alcohol and alcohol intoxication clearly impair one's cognition, in general alcohol intake primarily impairs psychomotor activities, driving ability, perceptual senses, sustained attention and information processing.[23,24,25]

Though acute, social, binge or regular patterns of alcohol intake affect one's cognition differently for older adults, a U or J shaped curve probably describes the relation best, which means light to moderate amount consumers showed a higher cognitive level than both abstainers or heavy drinkers; though exception to this 'attempted generalisation' has been mentioned by the same researchers.[26,27,28] It is important to mention here that the lower alcohol level have proportionally greater effect in the elderly due to their decreased lean body mass and lower body water percentage. Compared to men, women of any age have less body water, lean body mass and lowered amount of alcohol metabolizing enzymes which results in higher blood level of alcohol concentration for same amount of total drinking. To add on further, as women age, they show a greater susceptibility to the effect of alcohol, as alcohol both increases the conversion of androgen to oestrogen and decreases the metabolism of estradiol.[29,30]

In addition to the above, amnesic syndromes out of heavy alcohol intake (due to chronic nutritional deficiency of vitamin B1 or thiamine, which further causes dysfunction of Krebs Cycle and Pentose Phosphate Pathway leading to cytotoxic and vasogenic edema of brain),[31,32] namely Wernicke's encephalopathy (WE) and Korsakoff Syndrome(KS) have been found more commonly in elderly. As per current understanding, both are considered as a continuum or spectrum, i.e. Wernicke-Korsakoff Syndrome (WKS), where Korsakoff Syndrome or Psychosis has been considered as the residual effect of Wernicke's encephalopathy.

WE, clinically known for its triad of global confusion or mental status change, ophthalmoplegia or oculomotor abnormality and ataxia hardly presents with all these three together (observed among only 16-33% of patients on initial examination).[31,33,34] On the other hand, Korsakoff Syndrome or psychosis, which is more severe and often with irreversible memory loss in the presence of clear consciousness, mostly presents as a residual of WE, though not always preceded by a clear cut Wernicke's episode.[35] Older people are more at risk of having alcohol related amnesic syndrome compared to younger individuals with a similar length of heavy drinking. In addition to that, people who have had periods of drinking without a respite are at more risk compared to people who had periods of reduce drinking.[36] In the USA, the majority of patients diagnosed with WKS have shown a history of long term heavy or at risk alcohol intake.[37]

However, both WE and KS can happen even without any consumption of alcohol due to other causes of thiamine deficiency like severe and persisting vomiting, hyperemesis gravidarum, post-partum sepsis, toxic poisoning etc. More research and understanding are needed for WE and KS, including post mortem histopathological analyses to improve the knowledgebase to reflect preventive and management strategies.[35,38]

Alcohol and dementia

A long debate has kept researchers busy for more than a decade to find out any 'possible' 'protective' role of low and regular intake of specific types of alcohol in the progression of cognitive impairment or dementia. In a retrospective cohort, with more than 50,000 Japanese older adults over a 7-year follow-up duration (2008-2014), The Okayama Study found alcohol consumption of two or less units per day, occasionally or daily 'could' reduce the risk of incident dementia.[39] In a study with female US veterans (aged 55 years or more), alcohol use disorders appear to have more than a threefold increased risk of dementia, after adjusting for demographics, medical conditions like diabetes, hypertension, stroke, chronic obstructive pulmonary disorder, traumatic brain disorder and psychiatric conditions like depression, anxiety, post-traumatic stress disorder.[40]

Again, in a prospective cohort of 23 year follow up, the Whitehall II study conducted among the civil service departments in London, reported a mixed result where the risk of dementia was increased in people who abstained from alcohol in their midlife or consumed more than 14 units/week.[41] In a review article by Panza et al in 2009, based on multiple cross sectional and longitudinal studies, concluded that there was no indication of light and moderate alcohol drinking was harmful to cognition and dementia, nor that it was possible to comment on specific beneficial role of the same.[30]

It is noteworthy to mention here that recent literature highlights the methodological limitations of the existing observational studies; and alcohol consumption is gaining more recognition as an important risk factor for dementia through several pathways like neurotoxic effects of thiamine deficiency, ethanol, and acetaldehyde. More analytical and design-based future research approaches can provide a clear picture of the relationship between alcohol use and dementia, which of course has a significant geriatric and public health impact.[42]

Prognosis of alcohol related cognitive decline

Alcohol related brain damage and Korsakoff's dementia symptoms become stabilised once the alcohol use is stopped and the nutritional deficiencies are corrected. A study has shown that the patients with Korsakoff syndrome who were abstinent of alcohol did not show a significant decline over a period of two years. Their general knowledge, visual long-term memory, and verbal fluency had improved slightly. However, they still remained within pathological range with regards to the cognitive symptoms.[43]

Aging, poor physical, nutritional and environmental factors can give rise to negative outcomes in some cases and nursing home placements may be needed for some patients. If a patient continues to show cognitive decline despite alcohol abstinence, possibility of a primary dementia needs to be considered.[2] The outcome and prognosis may depend upon problems with the metabolism of alcohol, associated significant psychiatric or physical comorbidities.[44]

Predictors and risk factors

A study from UK found that the strongest independent predictors of higher alcohol consumption in older people were younger age, male gender, and some ethnic origins over others (Irish ethnicity over Asian, Black African or Black Caribbean). Socioeconomic deprivation and comorbidity were not significant predictors of alcohol consumption in older drinkers; however, the former has been found significant predictor of 'unsafe' consumption.[45] Another study found that a history of alcohol dependence in people without current heavy use is associated with lasting negative consequences for neurocognitive function.[46]

Screening and detection

Alcohol consumption, though culturally popular and well accepted in many countries, needs screening for a problematic or at-risk drinking behavior, but it is often neglected even amongst physicians. Some of the most

useful and commonly used screening tools are mentioned here which can help a quick identification of harmful use or dependence, as well as in understanding the severity of problem.

Screening tools

It is suggested to use standardised assessment tools to assess the nature and severity of alcohol misuse.[47-51] Some examples of the scales used are given in Box 1. National Institute for Health and Care Excellence (NICE) provides a comprehensive guideline for diagnosis, assessment and management of harmful alcohol drinking including alcohol dependence. There should be an aim to reduce both physical (such as hepatic or heart diseases) and mental health (such as depression or anxiety) harms, by improved assessment and definite goals to reduce consumption.[52] Also, Savage et al proposed five-step screening algorithm for alcohol use in elderly,[53] which includes monitoring and initial interventions, might be of use especially for non-psychiatric clinicians, as well as at primary health care facilities.

Box 1. Screening instruments for alcohol use

Questionnaires	Measures
*CAGE questionnaire	Screening Information about dependence
*Alcohol use disorders identification test (AUDIT)	Identification and as a routine outcome measure of alcohol use
*Severity of Alcohol Dependence Questionnaire (SADQ)	Severity of dependence
*Leeds Dependence Questionnaire (LDQ)	Severity of dependence
*Clinical Institute Withdrawal Assessment of Alcohol Scale-revised (CIWA-Ar)	Severity of withdrawal

Brief overview of management

Investigations and laboratory tests

Heavy alcohol users can have various blood changes like raised Mean Corpuscular Volume (MCV), or Gamma Glutamyl Transferase (GGT) or sometime both of them together. In some, both can be within the normal range as well. Raised MCV or GGT, being highly specific to alcohol induced liver damage, can be used as a measure of monitoring. However other causes for raised MCV (e.g. B12 or folate deficiency, thyroid abnormalities) and gamma GT (e.g. abnormal liver function, anticonvulsants) need to be excluded if they are used as markers.[3] If the patient has evidence of cognitive impairment, which is more significant for elderly people, dementia screening and appropriate imaging like Magnetic Resonance Imaging (MRI) or Computed Tomography (CT) scans will be useful, and may also exclude any reversible causes of cognitive impairment.

Assisted alcohol withdrawal

According to the NICE guidelines, inpatient or residential assisted withdrawal is considered if a person meets one or more of the following criteria. If they drink over 30 units of alcohol per day, have a score of more than 30 on the SADQ, have a history of epilepsy, or experience of withdrawal-related seizures or delirium tremens during previous assisted withdrawal programmes. Inpatient withdrawal is also considered if they need concurrent withdrawal from alcohol and benzodiazepines, regularly drink between 15 and 30 units of alcohol per day and have significant psychiatric or physical comorbidities or significant learning disability or cognitive impairment.[54] A lower threshold for inpatient withdrawal is considered for vulnerable groups, for example, homeless and older people.[55]

Management of individuals with amnesic syndromes

This depends on the individual's needs and the degree of the impairment. Many patients need rehabilitations. Abstinence is the main focus of a rehabilitation programme. In a well-structured environment, if new information is cued, Korsakoff patients are capable of new learning.[35] Some elderly patients might need supported accommodation or residential care.

According to NICE guidelines, for people with Wernicke-Korsakoff syndrome, a long-term placement needs to be considered. For those who have mild cognitive impairment, a place with supported independent living and for those who have moderate or severe cognitive impairment, a placement with 24-hour support is considered. In both placements the environment needs to be adapted for people with cognitive impairment, and support should be provided to help remain abstinent from alcohol,[44] which may improve the prognosis.

Conclusion

The use of alcohol appears to be associated with many difficulties in elderly with physical, psychiatric and social complications. The cognitive decline linked to alcohol use can lead to amnesia, mild cognitive disorder or dementia. They are often associated with low mood, social isolation and sometimes homelessness. There is an additional concern of continued social care for elderly with cognitive deficits. Therefore, it is very important to identify the elderly at high-risk and to educate them about the harmful effects of heavy alcohol use, institute management early and prevent secondary deterioration of health. Elderly people with alcohol use related complications would need extensive multidisciplinary medical and social care support. Prevention of harmful use of alcohol would be the key to minimise its costs on the individuals, health and social services. Further research is needed on prevention, effective management of cognitive deficits and methods to improve long term outcome of alcohol related disorders in elderly.

Acknowledgement

The Institute of Insight, UK for supporting with literature and preparation of the article.

Author information: Thanuja Vidyaratne, MBBS, MRCPsych, Consultant Psychiatrist, Steps to Health, Showell Circus, Wolverhamtpton, WV10 9TH, UK; Email: thanuja.vidyaratne@nhs.net; **Tanay Maiti**, MBBS, DPM, DNB, MNAMS, Senior Clinical Fellow and Specialist Psychiatrist, Black Country Healthcare NHS Foundation Trust (BCHFT), Penn Hospital, Penn Road, Wolverhampton, WV4 5HN, West Midlands, United Kingdom; Email: drtanaymaiti@gmail.com

Correspondence: Tanay Maiti, MBBS, DPM, DNB, MNAMS, Senior Clinical Fellow and Specialist Psychiatrist, Black Country HealthCare NHS Foundation Trust (BCHFT),Penn Hospital, Penn Road, Wolverhampton, WV4 5HN, United Kingdom; Email: drtanaymaiti@gmail.com

Competing interests: None

Received: 24 November 2021**; Revised:** 23 December 2021**; Accepted:** 24 December 2021

Citation: Vidyaratne T, Maiti T. Alcohol use in older adults: a review of clinical concerns. Journal of Geriatric Care and Research, 2021, 8, 2: 68-73.

References

1. Rao T. Trends in alcohol related admissions for older people with mental health problems: 2002 to 2012. Alcohol Concern, London, 2021.
2. Rao R, Draper B. Alcohol-related brain damage in older people. Lancet Psychiatry. 2015 Aug; 2(8):674-675. doi: 10.1016/S2215-0366(15)00215-1.
3. Paton A, Touquet R. ABC of alcohol BMJ by Alex (Editor), Publisher: Wiley-Blackwell; 4th Edition, 2005.
4. Mukherjee S. Alcoholism and its effects on the central nervous system. Current Neurovascular Res. 2013 Aug; 10(3):256-62.
5. Zahr NM, Pfefferbaum A. Alcohol's Effects on the Brain: Neuroimaging Results. In Humans and Animal Models. Alcohol Res. 2017; 38(2):183-206.
6. Deblinger L. Alcohol problems in the elderly. Patient Care, 2000; 34:70.
7. Adams SL & Waskel SA. Late onset of alcoholism among older Midwestern men in treatment. Psychological Reports, 1991, 68, 432.
8. Naik P & Jones RG. Alcohol histories taken from elderly people on admission. BMJ 1994:308, 248.
9. Adams WL, Barry KL, and Fleming MF. Screening for Problem Drinking in Older Primary Care Patients. Jama: Journal of The American Medical Association 1996, 276(24): 1964–1967.
10. Fleming MF, Manwell LB, Barry KL, et al. Brief Physician Advice for Alcohol Problems in Older Adults: A Randomized Community–Based Trial. Journal of Family Practice 1999; 48(5):378–384.
11. Moore AA, Morton SC, Beck JC, et al. A new paradigm for alcohol use in older persons. Medical care 1999;37(2):165–179.
12. Barry KL, Blow FC. Drinking over the lifespan: Focus on older adults. Alcohol Res. 2016; 38:115-20.
13. Kuerbis A, Sacco P, Blazer DG, Moore AA. Substance abuse among older adults. Clin Geriatr Med 2014, 30:629-54.
14. Dar, K. Alcohol use disorders in elderly people: Fact or fiction? Advances in Psychiatric Treatment 2006; 12(3), 173-181. doi:10.1192/apt.12.3.173.
15. Smith JW. Medical manifestations of alcoholism in the elderly. International Journal of Addictions, 1995, 30:1749–1798.
16. Lal R, Pattanayak RD. Alcohol use among the elderly: Issues and considerations. J Geriatr Ment Health 2017, 4:4-10.
17. Breslow RA, Dong C, White A. Prevalence of alcohol-interactive prescription medication use among current drinkers: United States, 1999 to 2010. Alcohol Clin Exp Res 2015; 39:371-9.
18. Han B, Gfroerer JC, Colliver JD, Penne MA. Substance use disorder among older adults in the United States in 2020. Addiction 2009, 104:88-96.
19. Solfrizzi V, Capurso C, D'Introno A, Colacicco AM, Santamato A, Ranieri M, Fiore P, Capurso A, Panza F. Lifestyle-related factors in predementia and dementia syndromes. Expert Rev Neurother. 2008; 8(1):133-58.
20. Horn JL, Cattell RB. Age differences in fluid crystal- lized intelligence. Acta Psychol (Amst) 1967; 26:107–129.
21. Qiu C, De Ronchi D, Fratiglioni L. The epidemiology of the dementias: an update. Curr Opin Psychiatry. 2007; 20(4):380-5.
22. Petersen RC, Smith GE, Waring SC, Ivnik RJ, Tangalos EG, Kokmen E Mild cognitive impairment: clinical characterization and outcome. Arch Neurol. 1999; 56(3):303-8.
23. Nixon SJ. Alcohol, aging, and cognition. In: Lisansky Gomberg ES, Hegedus AM, Zucker RA, eds. Alcohol Problems and Aging. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; NIH Publication, 1998; 98-4163.
24. Eckardt MJ, File SE, Gessa GL, Grant KA, Guerri C, Hoff- man PL, Kalant H, Koob GF, Li TK, Tabakoff B Effects of moderate alcohol consumption on the central nervous system. Alcohol Clin Exp Res 22, 1998; 998-1040.
25. Hindmarch I, Kerr JS Sherwood N. The effects of alcohol and other drugs on psychomotor performance and cognitive function. Alcohol Alcohol 1991; 26:71-79.
26. Goodwin JS, Sanchez CJ, Thomas P, Hunt C, Garry PJ, Good-win JM. Alcohol intake in a healthy elderly population. Am J Public Health 1987; 77: 173-177.
27. Hendrie HC, Gao S, Hall KS, Hui SL, Unverzagt FW. The relationship between alcohol consumption, cognitive

performance, and daily functioning in an urban sample of older Black Americans. J Am Geriatr Soc 44, 1996; 1158-1165.

28. Launer LJ, Feskens EJ, Kalmijn S, Kromhout D. Smoking; drinking; and thinking. The Zutphen Elderly Study. Am J Epidemiol 1996, 143:219-227.

29. Epstein EE, Fischer-Elber K, Al-Otaiba Z. Women, aging, and alcohol use disorders. J Women Aging. 2007; 19:31-48.

30. Panza, Francesco; Capurso, Cristiano; D'Introno, Alessia; Colacicco, Anna M.; Frisardi, Vincenza; Lorusso, Maria; Santamato, Andrea; Seripa, Davide; Pilotto, Alberto; Scafato, Emanuele; Vendemiale, Gianluigi; Capurso, Antonio; Solfrizzi, Vincenzo. Alcohol Drinking, Cognitive Functions in Older Age, Predementia, and Dementia Syndromes. Journal of Alzheimer's Disease, 2009;17(1), 7–31.doi:10.3233/JAD-2009-1009

31. Chandrakumar A, Bhardwaj A, Jong GW. Review of thiamine deficiency disorders: Wernicke encephalopathy and Korsakoff psychosis. J Basic Clin Physiol Pharmacol. 2018;30(2):153–62. https ://doi.org/10.1515/jbcpp -2018-0075.

32. Jung YC, Chanraud S, Sullivan EV. Neuroimaging of Wernicke's encephalopathy and Korsakoff's syndrome. Neuropsychol Rev. 2012;22(2):170-80. https://doi.org/10.1007/s11065-012-9203-4.

33. Latt N, Dore G. Thiamine in the treatment of Wernicke encephalopathy in patients with alcohol use disorders. Intern Med J. 2014;44(9):911–5.

34. Sechi G, Serra A. Wernicke's encephalopathy: new clinical set- tings and recent advances in diagnosis and management. Lancet Neurol. 2007;6(5):442–55

35. Kopelman MD, Thomson AD, Guerrini I and Marshall EJ. The Korsakoff Syndrome: Clinical Aspects, Psychology and Treatment. Alcohol & Alcoholism 2009; 44(2):148–154. doi: 10.1093/alcalc/agn118

36. Gelder M, Harrison P, Cowen P. Shorter Oxford Textbook of Psychiatry. 5 edition, Publisher: OUP, Oxford; 2006.

37. Colella, C., Savage, C., & Whitmer, K. (2010). Alcohol Use in the Elderly and the Risk for Wernicke-Korsakoff Syndrome. Journal for Nurse Practitioners, 6(8), 614-621. https://doi.org/10.1016/j.nurpra.2009.11.003

38. Nicolaas JM, Arts Serge JW,Walvoort Roy PC. Kessels Korsakoff's syndrome: a critical review. Neuropsychiatric Disease and Treatment 2017:13.

39. Liu Y, Mitsuhashi T, Yamakawa M, Sasai M, Tsuda T, Doi H, Hamada J. Alcohol consumption and incident dementia in older Japanese adults: The Okayama Study. Geriatr Gerontol Int. 2019 Aug;19(8):740-746. doi: 10.1111/ggi.13694.

40. Bahorik A, Bobrow K, Hoang T, Yaffe K. Increased risk of dementia in older female US veterans with alcohol use disorder. Addiction. 2021 Aug;116(8):2049-2055. doi: 10.1111/add.15416.

41. Sabia S, Fayosse A, Dumurgier J, Dugravot A, Akbaraly T, Britton A, Kivimäki M, Singh-Manoux A. Alcohol consumption and risk of dementia: 23 year follow-up of Whitehall II cohort study. BMJ. 2018 Aug 1;362:k2927. doi: 10.1136/bmj.k2927.

42. Visontay R, Rao RT, Mewton L. Alcohol use and dementia: new research directions. Curr Opin Psychiatry. 2021 Mar 1;34(2):165-170. doi: 10.1097/YCO.0000000000000679.

43. Fujiwara E, Brand M, Borsutzky S, Steingass HP, Markowitsch HJ. Cognitive performance of detoxified alcoholic Korsakoff syndrome patients remains stable over two years. J Clin Exp Neuropsychol. 2008 Jul;30(5):576-87.

44. NICE. Guidelines for alcohol use disorders: Interventions for conditions comorbid with alcohol misuse, NICE 1.3.8.6, https://www.nice.org.uk/guidance/cg115/chapter/1-Guidance#identification-and-assessment

45. Rao R, Schofield P, Ashworth M. Alcohol use, socioeconomic deprivation and ethnicity in older people. BMJ Open. 2015 Aug 24;5(8):e007525. doi: 10.1136/bmjopen-2014-007525.

46. Woods AJ, Porges EC, Bryant VE, Seider T, Gongvatana A, Kahler CW, de la Monte S, Monti PM, Cohen RA. Current Heavy Alcohol Consumption is Associated with Greater Cognitive Impairment in Older Adults. Alcohol Clin Exp Res. 2016 Nov;40(11):2435-2444. doi: 10.1111/acer.13211.

47. Ewing JA. Detecting alcoholism: the CAGE questionnaire. JAMA. 1984;252:1905-1907.

48. Babor TF, Higgins-Biddle JC, Saunders JB, Montiero MG. The Alcohol Use Disorders Test: guidelines for use in primary care. 2nd ed. Geneva, Switzerland: The World Health Organization; 2001.

49. Stockwell T, Murphy D & Hodgson R. The severity of alcohol dependence questionnaire: Its use, reliability and validity. British Journal of Addiction, 1983;78(2), 45-156.

50. Raistrick DS, Bradshaw J, Tober G, Weiner J, Allison J & Healey C. Development of the Leeds Dependence Questionnaire. Addiction, 1994; 89:563-572.

51. Sullivan JT, Sykora K, Schneiderman J, Naranjo CA & Sellers EM. Assessment of alcohol withdrawal: The revised Clinical Institute Withdrawal Assessment for Alcohol scale (CIWA-AR). British Journal of Addiction, 1989; 84: 1353-1357.

52. NICE. Guidelines for alcohol use disorders: Identification and assessment: General principles, NICE guidelines 1.2.1.4, https://www.nice.org.uk/guidance/cg115/chapter/1-Guidance#identification-and-assessment

53. Savage CL. Screening for alcohol use in older adults. Direct Addict Treat Prev. 2008;12: 17-26.

54. NICE. Guidelines for alcohol use disorders: Assessment and interventions for assisted alcohol withdrawal, NICE1.3.4.5, https://www.nice.org.uk/guidance/cg115/chapter/1-Guidance#identification-and-assessment

55. NICE. Guidelines for alcohol use disorders: Assessment and interventions for assisted alcohol withdrawal, NICE1.3.4.6, https://www.nice.org.uk/guidance/cg115/chapter/1-Guidance#identification-and-assessment

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Research

Multimorbidity and QRISK of older adults: results from a health check-up camp in Bhubaneswar, India

Shreyan Kar

Abstract

Background: In the aged multimorbidities are common, however the extent of the issues in the community, general awareness amongst individuals, and the changing scenario regarding their risks are not clear in various populations. **Aim:** It was intended to check the self-reported physical morbidities and evaluate their cardiovascular risk in a sample of older adults in India. It was also aimed to compare any gender differences and reflect upon the health education and management strategies for the population. **Method:** Through a health screening method, physical illnesses were noted and the QRISK score was evaluated in a sample of people attending a healthy ageing public education event. **Results:** There were 60 participants: 13 (21.7%) females and 47 (78.3%) males with mean age of 60.0 ± 6.9 and 62.2 ± 9.9 years respectively. Common health issues noted in the sample included hypertension (38.3%), diabetes (31.7%), on statins (21.7%) and arthritis (20.0%). Of the study population, 20% had one, 20% had two, 15% had three, 10% had four and 5% had five reported health conditions. The average number of diagnoses in female was 1.8 compared to 1.7 in males. The large majority (76.7%) of the sample had a body mass index of above 23. QRISK was significantly ($p<0.05$) more in males (20.3 ± 13.3) than females (11.7 ± 8.6). **Conclusion:** Basic health screening can identify the morbidities and cardiovascular risk, which existed in a considerable proportion of the sample studied. The proportions could be an underestimation and studies involving a larger sample through more detailed examinations and investigations may provide a more accurate picture of the population. There is need for improving community awareness and establishing appropriate health services to cater for multimorbidities.

Key words

Aged, Cardiovascular Risk, Community, Health Screening, India, Multimorbidity

Introduction

Health concerns in old age is well known;[1,2] and with increasing age, the number of illnesses increases too. Multimorbidity is common;[3] and is associated with greater suffering, increased care needs, dependence on caregivers for daily activities.[4] This naturally leads to a need for greater resources in the health care system, and adds to the stress of informal caregivers in the family.[5] With the complexities of caregiving issues, unavailability of professional and non-professional caregivers, financial constraints impacting health care, the social security of the older adults has been compromised.[6] In addition, there are generational problems, relationship problems and loneliness which impact the state of health of the elderly.

It is known that the Indians are particularly at risk of cardiometabolic disorders.[7,8] There is a high prevalence of hypertension and diabetes in the Asian population.[9] Considering the higher vulnerability of the Asian population for cardiovascular illnesses, there is a consensus that Asians should take action regarding their metabolic disorder risk at a lower score of 23 body mass index (BMI) rather than the usual cut-off score of 25.[10]

There is a need to appraise the older adult community about the illnesses they have, the risk factors and the impact these have in their life. Many approaches have been tried including public education and individualised health passports. Health passports have been particularly helpful to holistically review the health concerns and interventions in individual patients.[11]

Aim

In the above context, it was intended to check the self-reported physical morbidities of older adults and evaluate their QRISK. It was also aimed to compare between genders and reflect upon the health education and management strategies for the population.

Method

The sample included the attendees of the Healthy Ageing conference in Bhubaneswar arranged by Geriatric Care and Research Organisation (GeriCaRe) in 2019. Bhubaneswar is the capital city of Odisha, an eastern state of India. All attendees of the conference were invited to attend a free health check-up camp. They were asked regarding their medical history and went through a physical examination.

The variables collected were age, gender, known health problems; and specific enquiries were made for high

blood pressure, diabetes, arthritis, and being on statin. Available results of blood sugar, cholesterol, uric acid, were noted. Their blood pressure, pulse, height, weight, waist circumference were measured.

Based on the available information the QRISK was calculated.[12] QRISK takes into account different variables and it score enables identification of those at most risk of heart disease and stroke.[13]

The project was approved by the Ethics Committee of the Quality of Life Research and Development Foundation (QoLReF). Written informed consent was taken for their health related data to be used for research. Anonymity of data was assured; option of non-participation or withdraw from the study at any time were explained. Assessment and support from the Health Check-up camp was provided irrespective of the agreement for study participation. All the participants were given a health card and advice by the supporting physicians.

Data were entered into an excel spreadsheet, and was quality checked. Statistical analysis was done by SPSS version 25 (IBM Limited). Missing data were not calculated. Statistical significance was kept at the standard 0.05 level.

Results

There were 60 participants: 13 (21.7%) females and 47 (78.3%) males. The mean age of females (60.0 ± 6.9) was comparable to that of males (62.2 ± 9.9). Health conditions as reported by them included hypertension (38.3%), diabetes (31.7%), being on statin (21.7%), arthritis (20.0%). There was a range of physical problems reported; commonly reported ones were pain, urinary incontinence, prostrate related issues, thyroid problems, insomnia, etc. A minority (30%) of the sample reported no health problems; whereas, 20% had one, 20% had two, 15% had three, 10% had 4 and 5% had 5 reported health conditions.

Gender differences are presented in Table 1. The average numbers of diagnoses in females were 1.8 compared to 1.7 in males. Prostrate related issues were reported in 12.8% of males. Urinary problems mainly incontinence (8.5%) and insomnia (4.3%) were only reported by males. There were no significant differences in the proportion of males and females who reported having hypertension, diabetes, arthritis and statins.

Table 2 provides the figures for basic physical parameters and QRISK of both of the genders. Out of 25 people with a measured waist circumference, 20 (80.0%) were above the threshold for very high risk (Asian male: 90 cm and Asian female: 80 cm). It is evident that while the BMI was comparable, the QRISK scores of males were significantly greater than the females. BMI ranged from 18.4 kg/m^2 to 33.1 kg/m^2 in the sample, with a mean of 25.3 ± 3.1 kg/m^2. In the sample, 14 (23.3%) people had BMI values below 23 kg/m^2 whereas 76.7% had scores above 23 kg/m^2 signifying that the majority had a higher cardiovascular risk. Similarly, the sample had a mean QRISK score of 18.5 ± 12.9, with a range of 0.4 to 55.1. A major proportion (70%) of the sample had a QRISK score of more than 10.

Table 1. Self-reported morbidities in different genders

	Female (n=13)	Male (n=47)
Hypertension	41.7	47.4
Diabetes	33.3	39.5
On Statin	25.0	26.3
Arthritis	33.3	27.7
Thyroid problems	7.7	4.3
Neurological problems	7.7	4.3
Gastrointestinal problems	7.7	2.1

Figures are in %

Discussion

The study evaluated the existing physical morbidities and assessed the QRISK in a sample of Indian adults attending a healthy ageing community event. A considerable proportion of the elderly seen in this study had BMI at high risk level, and reported multiple physical health problems; which were comparable between males and females. However males had a higher cardiovascular risk when compared to females, based on QRISK. Cardiovascular diseases are known to be a major cause of death in India contributing to more than a quarter of the total deaths.[14] The findings reflect the increased morbidity level in the elderly population studied.

Morbidities

As expected, physical morbidities were highly prevalent in the elderly population. In the studied sample, a considerable proportion had hypertension (38.3%), diabetes (31.7%), arthritis (20.0%) and were on statins (21.7%). Similar findings have been reported in rural elderly populations in India, e.g. hypertension (37.7%), diabetes (36.5%), visual impairment (36.5%), and joint pains (30.5%).[15] Reported prevalence figures have differed, considering the type of sample and method of data collection. For example, in a multicentre study with a population based sample in India, the reported prevalence of diabetes was 15.7%; among participants with diabetes versus those without, prevalence of hypertension was 73.1% and 26.5% respectively; and a quarter of patients with diabetes were undiagnosed.[16] The sample in the current study appeared to be aware of health issues in the old age and as they were attending a health event, it indicated a probable higher awareness than the general population.

Multiple comorbidities are well known in old age. In this study, the average number of diagnoses in female was 1.8 compared to 1.7 in males. In the sample, 20% had one, 20% had two, 15% had three, 10% had four and 5% of attendees had five health conditions. In a study in Kerala, India, 34.1% had one, 24% had two and 31.1% had three or more conditions.[15] In Italy, 56.7% of elderly aged 65 or more had two or more conditions.[1] Similar findings have been reported elsewhere.[17,18] Multiple morbidities not only increase the risk of mortality, but the intensity of care needs, caregivers' burden and stress.

Table 2. Basic physical examination results and QRISK

	Male		Female		t	df	p
	Mean	SD	Mean	SD			
Height	167.2	5.7	159.8	5.4	4.176	58	.000
Weight	70.9	10.5	65.2	8.7	1.796	58	.078
Waist	96.0	10.9	104.5	17.7	-1.021	23	.318
Systolic	129.3	12.5	131.3	9.2	-.545	58	.588
Diastolic	77.1	10.0	79.4	6.8	-.761	58	.449
Pulse	72.1	10.4	73.2	10.8	-.356	58	.723
BMI	25.2	3.1	25.6	3.4	-.356	58	.723
Qrisk	20.3	13.3	11.7	8.6	2.201	58	.032

Gender differences

In this study, it was found that males had a higher QRISK score than females, although the proportions having diabetes, hypertension and being on statin were comparable; so also, the mean BMI in the two genders was similar. There are gender specific cardiovascular risk factors;[19,20] and it has been reported that risk from dying from cardiovascular disease has increased over the years in India.[21]

BMI

WHO recommended that a BMI of 23 kg/m^2 and above for Asians should suggest that the individual has an increased metabolic risk and therefore warrants action.[10] The majority (76.7%) of the sample of this study had a BMI of above 23 kg/m^2 suggesting the increased risk of type II diabetes and other chronic illnesses. This also indicates the requirement for preventive health actions, life-style changes and interventions.

QRISK

Many studies in India have used QRISK to measure the cardiovascular risks. In an outpatient setting in India, the mean 10-year CVD risk was 28.4% for patients with type II diabetes; this was 5.7-fold more than the matched healthy adults.[22] In this study, the majority (70%) of the sample had a QRISK score of more than 10 and it was significantly ($p<0.05$) more in males (20.3 ± 13.3) than females (11.7 ± 8.6). In contrast to 70% who should be preferably on statins based on their QRISK,[23] only 21% of the sample was on it. There is a massive need for public education in the community; and the treating physicians should also take a note of these disparity.

It should be highlighted that cardiovascular risk prediction based on QRISK3 performs well for populations, but there is uncertainty at individual levels,[24] in older adults and those with multimorbidity.[25] This suggests the need for further studies in Indian populations for further calibration of QRISK3 and greater clinical attention by the treating physicians.

Lack of mental health issues

It was interesting that very few people mentioned about insomnia and substance use related issues. There were no issues reported about any mental health problems. Probably, these conditions need to be asked about specifically. It is known that a considerable proportion of older adults have sleep problems, self-medicate, and become dependent on benzodiazepines or other medications. The absence of reports of any mental health issues can be secondary to various reasons: these may not be recognised e.g., depression or anxiety disorders; memory impairments are usually considered part of ageing process than possibly another disorder; and stigma as many people do not wish to open up about it. However, mental illnesses in elderly are highly prevalent and may need to be specifically enquired for in a confiding clinical set up.

Public education components

There are evidence based recommendations on maintaining a healthy lifestyle which can decrease the risk of cardiovascular events.[26] The need to develop specific guidelines for Indian elderly population, with their risk pattern and life style, and to improve the awareness of cardiometabolic risk in the community have been well understood;[8] however it seems there is less than desired action at the ground level. Based on the findings of this study, a few components of the public education can be suggested, which may be helpful for professionals and the caregivers as well. A suggested plan of public education is given in Box 1.

Box 1. Components of public education for age related health issues

1. Existence of multiple illnesses
2. Increase in morbidity and mortality
3. Specific information about mental health conditions
4. Increase in care needs
5. Need for preventive and management strategies
6. Lifestyle changes
7. Early identification and appropriate medicinal intervention of hypertension, diabetes and dyslipidaemia
8. Preventive measures e.g., regular check-ups, statin when appropriate, avoiding self-medication leading to dependence and complication

Limitations

The study has many limitations; primarily that it has a small sample size, which limits its generalisability. There were no detailed examinations or investigations to other possible morbidities. The studied sample was highly involved in their health and wellbeing and was attending a healthy ageing event, so, the findings may not be applicable to the older adults in the community.

Conclusions

This health screening study suggested a high prevalence of metabolic disorders and other illnesses in the elderly. There was an appreciable awareness among this urban sample attending a health event. Results reflect the higher cardiovascular risk of the Indian population and highlight the need for public education about the impact of these morbidities on life and the care of the elderly. It also suggests that the health care system needs to address these issues via public health promotion and prevention; as well as making the interventions available and affordable. Future studies should involve higher sample sizes, in varied settings, including the rural backgrounds where most of the Indian elderly population live. In addition, there should be more detailed enquiries involving substance use and mental health issues to provide a more holistic assessment of the morbidities.

Acknowledgement

Author wishes to thank GeriCaRe (Geriatric Care and Research Organisation), India for providing the support to conduct the assessments and examinations during the Health Ageing Conference. Author also acknowledges the help received from The Institute of Insight, UK regarding literature, data management and analysis.

Author information: Shreyan Kar, MBChB Student, Birmingham Medical School, University of Birmingham, Edgbaston, Birmingham, B15 2TT, United Kingdom

Correspondence: Shreyan Kar, Birmingham Medical School, University of Birmingham, Edgbaston, Birmingham, B15 2TT, United Kingdom; Email: kar.shreyan@gmail.com

Competing interests: None

Received: 2 December 2021; **Revised:** 23 December 2021; **Accepted:** 25 December 2021

Citation: Kar S. Multimorbidity and QRISK of older adults: results from a health check-up camp in Bhubaneswar, India. Journal of Geriatric Care and Research, 2021, 8, 2:74-78.

References

1. Atella V, Piano Mortari A, Kopinska J, et al. Trends in age-related disease burden and healthcare utilization. Aging Cell. 2019;18(1):e12861. doi:10.1111/acel.12861

2. Kar S, Das T, Mohapatra P, Kar B, Senapati A, Kar N. Health Concerns of Older Adults: Observations from a Survey and Public Education Programme in Bhubaneswar, India. J Indian Acad Geriatr. 2019; 15: 10-16. doi: 10.35262/jiag.v15i1.10-16

3. Kar N. Holistic care for older adults needs attention to multimorbidity. J Geriatr Care Res. 2019;6(1):1-2.

4. Maresova P, Javanmardi E, Barakovic S, et al. Consequences of chronic diseases and other limitations associated with old age – a scoping review. BMC Public Health. 2019; 19(1): 1431. doi:10.1186/s12889-019-7762-5

5. Kar N. Family members as caregivers of older people with mental illness: issues and interventions. J Geriatr Care Res. 2021;8(1):21-28.

6. Kar S, Mohapatra P, Kar B, et al. Social security of elderly is at stake: concerns raised by older adults from India. J Geriatr Care Res. 2019;6:64-68.

7. Gupta P, Prieto-Merino D, Ajay VS, et al. Cardiovascular risk prediction in India: Comparison of the original and recalibrated Framingham prognostic models in urban populations. Wellcome Open Res. 2019; 4:71. doi:10.12688/wellcomeopenres.15137.1

8. Misra A, Khurana L. The metabolic syndrome in South Asians: epidemiology, determinants, and prevention. Metab Syndr Relat Disord. 2009; 7(6): 497-514. doi:10.1089/met.2009.0024

9. Nag T, Ghosh A. Cardiovascular disease risk factors in Asian Indian population: A systematic review. J Cardiovasc Dis Res. 2013;4(4):222-228. doi:10.1016/j.jcdr.2014.01.004

10. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004; 363(9403):157-163. doi:10.1016/S0140-6736(03)15268-3

11. Kar N, Parhi GK, Kar S, Kar B. Feasibility of assessing the awareness of cardiovascular risk through Health Passport approach: A pilot study. CHRISMED J Health Res. 2016;3(4):273. doi:10.4103/2348-3334.190576

12. QRISK3. Published 2018. Accessed May 1, 2017. https://www.qrisk.org/

13. Hippisley-Cox J, Coupland C, Brindle P. Development and validation of QRISK3 risk prediction algorithms to estimate future risk of cardiovascular disease: prospective cohort study. BMJ. 2017; 357:j2099. doi:10.1136/bmj.j2099

14. India State-Level Disease Burden Initiative CVD Collaborators. The changing patterns of cardiovascular diseases and their risk factors in the states of India: the Global Burden of Disease Study 1990-2016. Lancet Glob Health. Published online September 11, 2018. doi: 10.1016/S2214-109X(18)30407-8

15. Das RA, Kumar SG, Roy G. Morbidity pattern and its relation to functional limitations among old age rural population in Kerala, India. J Fam Med Prim Care. 2017;6(2):301-304. doi:10.4103/2249-4863.220015

16. Gupta A, Gupta R, Sharma KK, et al. Prevalence of diabetes and cardiovascular risk factors in middle-class urban participants in India. BMJ Open Diabetes Res Care. 2014;2(1):e000048. doi:10.1136/bmjdrc-2014-000048

17. Piccirillo JF, Vlahiotis A, Barrett LB, Flood KL, Spitznagel EL, Steyerberg EW. The Changing Prevalence of Comorbidity Across the Age Spectrum. Crit Rev Oncol Hematol. 2008;67(2):124-132. doi:10.1016/j.critrevonc.2008.01.013

18. Woo E kyung, Han C, Jo SA, et al. Morbidity and related factors among elderly people in South Korea: results from the Ansan Geriatric (AGE) cohort study. BMC Public Health. 2007;7(1):10. doi:10.1186/1471-2458-7-10

19. Bajaj S, Mahajan V, Grover S, Mahajan A, Mahajan N. Gender Based Differences in Risk Factor Profile and Coronary Angiography of Patients Presenting with Acute Myocardial Infarction in North Indian Population. J Clin Diagn Res JCDR. 2016; 10(5): OC05-OC07. doi: 10.7860/JCDR/2016/16512.7725

20. Desai S, Munshi A, Munshi D. Gender Bias in Cardiovascular Disease Prevention, Detection, and Management, with Specific Reference to Coronary Artery Disease. J -Life Health. 2021; 12(1):8-15. doi:10.4103/jmh.jmh_31_21

21. Ke C, Gupta R, Xavier D, et al. Divergent trends in ischaemic heart disease and stroke mortality in India from 2000 to 2015: a nationally representative mortality study. Lancet Glob Health. 2018; 6(8): e914-e923. doi: 10.1016/S2214-109X(18)30242-0

22. Ghosal S, Sinha B, Ved J, Biswas M. Quantitative measure of asymptomatic cardiovascular disease risk in Type 2 diabetes: Evidence from Indian outpatient setting. Indian Heart J. 2020;72(2):119-122. doi:10.1016/j.ihj.2020.03.010

23. Scenario: CVD risk 10% or more | Management | CVD risk assessment and management | CKS | NICE. Published 2020. Accessed December 20, 2021. Available at https://cks.nice.org.uk/topics/cvd-risk-assessment-management/management/cvd-risk-10percent-or-more/

24. Li Y, Sperrin M, Belmonte M, Pate A, Ashcroft DM, van Staa TP. Do population-level risk prediction models that use routinely collected health data reliably predict individual risks? Sci Rep. 2019;9(1):11222. doi:10.1038/s41598-019-47712-5

25. Livingstone S, Morales DR, Donnan PT, et al. Effect of competing mortality risks on predictive performance of the QRISK3 cardiovascular risk prediction tool in older people and those with comorbidity: external validation population cohort study. Lancet Healthy Longev. 2021;2(6):e352-e361. doi:10.1016/S2666-7568(21)00088-X

26. Jung J, Garnett E, Cao J, Devaraj S. Lifetime risks factors and assessment of cardiovascular disease. J Lab Precis Med. 2020;5(0). doi:10.21037/jlpm-2019-cpm-04

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2020, Vol 8, No 2

Creative Expressions

Immersion

Bijay Biswaal

The painting is about an old man in his late seventies in the dark alleys of Lucknow bazar eking out a living doing what he has been doing for half a century. It was originally titled '*DARJEE*' in Hindi, which means a tailor. The desire to earn one's own livelihood seems to have rooted in him. Maybe it's his passion to stich forks and kurtas for little girls and boys; and he must be observing them indulgingly while sipping tea as they walk by on the narrow Lucknow lanes.

It is a watercolour on handmade paper (size 22x14 inches). Colours used here are ultra-marine, cobalt blue, burnt sienna, neutral, Payne's grey, yellow ochre, and little crimson.

Artist information: Bijay Biswaal

Correspondence: Bijay Biswaal, Nagpur, India; Email: biswaaltheartist@gmail.com

Citation: Biswaal B. Immersion. Journal of Geriatric Care and Research, 2021, 8, 2: 79.

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Information capsule

Healthy Ageing 2021 International Conference

GeriCaRe (Geriatric Care and Research Organisation) organised the Healthy Ageing 2021 International Conference on 14/8/2021 as a webinar. Delegates from many countries especially India and UK attended. This conference allows older adults, their family caregivers, and professionals to participate.

It is a free to attend conference that brings together professionals and general public in one stage for better interaction and sharing of practical knowledge based on recent advances.

Speakers and topics

This year's conference has topics from neurology, Yoga, cardiology and oncology.

Dr Chandi Das, MD, DM, Senior Staff Specialist in Neurology at the Canberra Hospital, Australian Capital Territory (ACT) Health, Canberra, Australia talked about 'Common problems in advanced Parkinson's disease'.

Prof B N Gangadhar, MD, DSc, President, Medical Assessment & Rating Board, National Medical Commission, New Delhi, India gave a talk on 'Yoga and Neurosenescence'.

Dr Sanjiv Petkar, MD, FRCP, Consultant Cardiologist- Devices, Syncope and Lead Electrophysiologist, Heart and Lung Centre, New Cross Hospital, Wolverhampton, UK spoke about 'Application of modern cutting-edge cardiac therapies in the elderly'.

Dr Anjana Satpathy, MS, FRCS, LLM from University Hospital of South Manchester, UK, highlighted about the 'Cancer in elderly – general perspective and advances in management'.

The talks were moderated by Prof Jagadisha Thirthalli, MD, from National Institute of Mental Health and Neurosciences (NIMHANS), and Dr Biswa Mishra, MD, FRCP, Oldham Care Organisation, UK.

Dr Nilamadhab Kar, Consultant Psychiatrist, Black Country Healthcare NHS Foundation Trust Wolverhampton, UK was the Chair, Organising Committee; and Dr Prasanta Kumar Mohapatra Consultant Psychiatrist at the District Headquarter Hospital, Cuttack, Odisha was the Organising Secretary of the conference. Both of them also moderated some of the academic sessions of the conference.

The conference attendance was accredited for Continuing Medical Education points by the Odisha Council of Medical Registration.

The conference was well covered by the print, electronic and social media.

There was active participation from the audiences. The feedbacks from the attendees have been highly positive. A participatory platform with opportunity of interaction between professionals and general public was highly appreciated. There were request and suggestion for topics in the future conferences. More frequent webinars were requested too.

The conference was supported by Altima, INTAS as a Knowledge Sharing Partner supporting the webinar technically. GenX studios Bhubaneswar helped in postproduction work on videos and hosting them online (the lectures are available in YouTube). Other supporting organisations were the Quality of Life Research and Development Foundation (QoLReF) and The Institute of Insight, UK.

Suresh Chandra Rath, PhD, DSc. Former Principal Scientist, Central Institute of Freshwater Aquaculture, Bhubaneswar, India, Email: scrathcifa@yahoo.com

JOURNAL OF GERIATRIC CARE AND RESEARCH

ISSN 2397-5628
Journal of Geriatric Care and Research
2021, Vol 8, No 2

Manuscript Preparation

Instructions for authors

Introduction

The *Journal of Geriatric Care and Research (JGCR)* (ISSN 2397-5628) is the official publication of Geriatric Care and Research Organisation (GeriCaRe).

Aims and scope

JGCR publishes articles from all fields relevant to old age, with an objective of encouraging evidence based practice in the care of elderly and to share information about good practice.

It is a multidisciplinary, peer-reviewed, scholarly journal covering diverse areas such as geriatric medicine, psychiatry, neurology, nursing care, end of life care, public health and related fields like gerontology, sociology, psychology, culture and law along with Allied Health Sciences like occupational therapy and physiotherapy, etc. Examples of broad areas covered by the journal are: Care and intervention for various specific conditions, disorders or disabilities, standards of care, examples of good practice, end-of-life care, elder abuse and its prevention, legal aspects relevant to old age and support; cultural and ethical issues associated with care, etc. Its readership includes not only the professionals in these fields but also older persons and their caregivers.

Besides regular issues, theme based special issues focusing one aspect of care are also published periodically.

Editorial process

The *JGCR* follows in principle the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals by the International Committee of Medical Journal Editors (ICMJE) and the Committee on Publication Ethics (COPE).

Contributions for *JGCR* are accepted for publication on the condition that their substance (whole or part) has not been published or submitted for publication elsewhere, including internet. If there are other papers from same database, then the authors must send all details of previous or simultaneous submissions.

All submitted articles are peer reviewed. At the first step, the articles are assessed by the editorial board for its suitability for the formal review.

If found suitable, the manuscripts undergo a double-blind peer review. The suggestions received from reviewers are conveyed to the corresponding author. When appropriate, the author is requested to provide a point by point response to reviewers' comments and submit a revised version of the manuscript.

Manuscripts accepted for publication are copy-edited to improve readability and to ensure conformity with *JGCR* style.

Authorship

Authorship credit should be based only on substantial contribution to:

- Conception and design, or analysis and interpretation of data
- Drafting the article or revising it critically for important intellectual content, and
- Final approval of the version to be published

All these conditions must be met. Participation solely in the collection of data or the acquisition of funding does not justify authorship. In addition, the corresponding author must ensure that there is no one else who fulfils the criteria but has not been included as an author.

Group authorship is permitted, but in this case individual authors will not be cited personally.

If a professional medical writer was used for manuscript preparation, their name and contact details must be given in the acknowledgement and any conflicts of interest must be disclosed.

The corresponding author must sign the contributors form on behalf of all the authors, once a manuscript has been accepted. This author must take responsibility for keeping all other named authors informed of the paper's progress.

Unless otherwise stated corresponding author will be considered as the guarantor of the article. However one or more authors/contributors can be guarantor. The guarantor accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Declaration of competing interest

All submissions to the *JGCR* (including editorials and letters to the Editor) require a declaration of competing interest. This should list fees and grants from, employment by, consultancy for, shared ownership in, or any close relationship with, at any time over the preceding three years, an organisation whose interests may be affected by the publication of the paper.

Ethics approval of research

The *JGCR* expects authors to follow the World Association's Declaration of Helsinki and base their article on researches conducted in a way that is morally and ethically acceptable. The research protocol must have been approved by a locally appointed ethics committee or institutional review board.

Every research article must include a statement that the investigators obtained ethical approval for the study (or an explanation of why ethical approval was not needed) in the methods section of the manuscript with the name and location of the approving ethics committee(s).

Patient consent and confidentiality

A statement regarding informed consent must be included in the methodology. Studies involving humans must have written informed consent from the patients. Where the individual is not able to give informed consent for lack of mental capacity, it should be obtained from a legal representative or other authorised person. If consent cannot be obtained because the patient cannot be traced then publication will be possible only if the information can be sufficiently anonymised. Anonymisation means that neither the patient nor anyone could identify the patient with certainty. Such anonymisation might, at an extreme, involve making the authors of the article anonymous. If the patient is dead, the authors should seek permission from a legal representative or other authorised person as a matter of medical ethics.

The authors should check the specific laws in their country. Contributors should be aware of the risk of complaint by individuals in respect of breach of confidentiality and defamation; and must archive the signed informed consent form.

The process used to assess the subject's capacity to give informed consent and safeguards included in the study design for protection of human subjects should be mentioned.

Publication Ethics

Authors should consider all ethical issues relevant to publication. This includes (but not restricted to) avoiding multiple submission, plagiarism and manipulation of figures/data. Any concerns in this regard must be brought to the attention of the Editor and these will be investigated by procedures recommended by the Committee on Publication Ethics (COPE). If conclusive evidence of misconduct is found, the *JGCR* undertakes to publish a correction or retraction of article as necessary.

Clinical trial registration

All clinical trials must be registered in a public trials registry. This is a requirement for publications of the trials.

Qualitative research

The *JGCR* welcomes submissions of reports of qualitative research relevant to the scope of the care of elderly.

Article submission

Manuscripts for publication are submitted via email <jgcr.gericare@gmail.com>.

The *JGCR* is not responsible for statements made by authors. Material in the *JGCR* does not necessarily reflect the views of the Editors or of GeriCaRe.

Type of manuscripts

Research article

The research article should normally be between 3000 and 4000 words in length (excluding references, tables and figure legends). Only the essential references should be given, preferably not more than 25 beyond those describing statistical procedures, psychometric instruments and diagnostic guidelines used in the study. Authors are encouraged to present key data within smaller tables in the appropriate places in the running text. This applies also to review articles and short reports.

A structured abstract not normally exceeding 150 words should be given at the beginning of the article, incorporating the following headings: Background, Aims, Method, Results, and Conclusions.

Key words: Up to six key words should be provided. Please use Medical Subject Headings (MeSH) as key words.

Article should have Introduction, Method, Results and Discussion sections. Authors may use relevant subheadings under these sections. Introductions should normally be no more than one paragraph; longer ones may be allowed for new and unusual subjects. The Discussion should always include limitations of the paper to ensure balance. A paragraph of practical implications of the observations is encouraged.

Short report

Short reports (brief communications) are based on original research, observational or evaluation studies, clinical audits etc. These are structured as research articles and require an unstructured abstract of one paragraph, not exceeding 100 words; and key words. The report should not exceed 1500 words (excluding references, tables and figure legends) and contain no more than one figure or table and up to 10 essential references beyond those describing statistical procedures, psychometric instruments and diagnostic guidelines used in the study.

Case report

Case reports and series require up to 100 word abstract, and the length should not exceed 1000 words (excluding references, tables and figure legends). The written informed consent of the individuals must be obtained and submitted with the manuscript. Please refer to patient consent and confidentiality paragraph for further detail. In general, case studies are published in the *JGCR* only if the authors can present evidence that the case report is of fundamental significance and it is unlikely that the

scientific value of the communication could be achieved using any other methodology.

Review

Systematic and narrative review articles should be structured in the same way as research article, but the length of these may vary considerably, as will the number of references. It requires a structured abstract like that of research articles.

Short review

These articles focus on highly topical issues based on evidence. Professional perspectives, viewpoints, commentary and opinion are included here. It can also include clinical review relevant to the practitioners. These articles are usually more broad-based than editorials. They can include tables and figures. Usual length is around 1500 words (excluding references) with an unstructured abstract up to 100 words.

Editorial

Editorials require an unstructured summary of one paragraph, not exceeding 50 words. Editorials should not exceed 1000 words and may contain no more than one figure or table and up to 10 essential references.

Letters to the Editor

Letters may be submitted either as responses to published articles, to inform about particular situation or raise pertinent issues, as expert opinion or as general letters to the Editor. Letters may be up to 400 words in length with a maximum of 5 references.

Insight

These articles include variety of topics which may reflect an individual perception, involvement or contribution to geriatric care. It can include good practice examples, inspirational experiences and highlight neglected areas. Essays in descriptive prose can be submitted on any topic related to geriatric care. These are usually written by a single author but a second author may be included occasionally. The length of the articles may vary considerably depending upon the topic and may be up to 2000 words excluding references. An unstructured summary of around 100 words is preferred but not mandatory. Use of subheadings is encouraged.

First person account

In first person accounts *JGCR* publishes experiences of older persons or their care providers about the care and concerns of the elderly, that can be considered significant and provide learning points for others.

Columns

These comprise a range of materials considered to be of interest to readers of the *JGCR*. This section includes reviews on book, film or web resources as short articles up to 400 words. Some other examples include News regarding developments that can influence the care of elderly, poems, paintings, photographs, quotations, information about important internet links, etc. These articles are published individually or as fillers at the end of other articles where space allows.

Preparation of Manuscripts

Prepare article in Word, A4 size page, with 1 inch margin, double spaced throughout.

Article information page

1. Type of manuscript:
2. Title of the article: Brief and relevant
3. Running title / key words / subject area
4. Name of the authors: (underline Last name)
5. Details of authors: academic degrees, professional position, institutional affiliations, professional address, email
6. Corresponding author: name, address, phone, fax, e-mail and ORCID
7. Contributions of each author:
8. Word count for abstract:
9. Word count for the text (excluding references):
10. Number of photographs/images (to be provided separately in high quality JPEG files):
11. Acknowledgement:
12. Competing interests:
13. Funding
14. Suggested Reviewers Up to 3, (not from authors' institution). Name, Position, Institution and Email

No identifiable details beyond this page.

Article Text pages

The article text pages do not contain any identifiable information, for a blind review. It should contain: Title of the article, Abstract and Key words (depending upon the article type) and the Text of the article. Please refer to article types for detail information. As a general rule, please have an Introduction and Conclusion subheadings whenever possible along with other required subheadings.

References

Authors are responsible for checking all references for accuracy and relevance in advance of submission. All references should be given in superscripted number in the order they appear in the text. Place superscript reference number after commas and full stops, unless the superscript is attached to authors name or title of book/database. At the end of the article the full list of references should follow the ICMJE style. If there are more than six authors, the first six should be named, followed by 'et al'.

Example of journal articles:

The authors' names are followed by the full title of the article; the journal title abbreviated according to the PubMed; the year of publication; the volume number; (issue number in bracket); and the first and last page numbers.

1. Singh SP, Singh V, Kar N, Chan K. Efficacy of antidepressants in treating the negative symptoms of chronic schizophrenia: meta-analysis. Br J Psychiatry. 2010; 197(3): 174-9.

References to books should give the names of any editors, place of publication, editor, and year. Examples are shown below.

2. Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

3. Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

4. Foley KM, Gelband H, editors. Improving palliative care for cancer [Internet]. Washington: National Academy Press; 2001 [cited 2002 Jul 9]. Available from: http://www.nap.edu/books/0309074029/html/.

5. Cancer-Pain.org [Internet]. New York: Association of Cancer Online Resources, Inc.; c2000-01 [updated 2002 May 16; cited 2002 Jul 9]. Available from: http://www.cancer-pain.org/.

Personal communications need written authorisation (email is acceptable); they should not be included in the reference list. Unpublished doctoral theses may be cited (please state department or faculty, university and degree). No other citation of unpublished work, including unpublished conference presentations, is permissible. Further information about the references can be availed from http://www.nlm.nih.gov/bsd/uniform_requirements.html

Tables

Tables should be numbered and have an appropriate heading. The tables should be mentioned in the text such as Table 1 and the desired position in the manuscript should be indicated. Information in tables must not be duplicated in the text. The heading of the table, together with any footnotes or comments, should be self-explanatory. The table should be placed at the end of the manuscript after references, each in a separate page. Authors must obtain written permission from the original publisher if they intend to use tables from other sources, and due acknowledgement should be made in a footnote to the table.

Figures

Figures must be of high quality and provided in JPEG files separately. They should be clearly numbered and include an explanatory legend. Legends can be provided at the end of the article after the references. All figures should be mentioned in the text (such as Fig 1) and the desired position of the figure in the manuscript should be indicated. Authors must obtain written permission from the original publisher if they intend to use figures from other sources, and due acknowledgement should be made in the legend.

For ease of formatting please use the available article template.

Abbreviations, units and footnotes

All abbreviations must be spelt out on first usage and only widely recognized abbreviations will be permitted. Abbreviations usage should be consistent throughout the article. Use abbreviations sparingly; consider using one if it is repeated more than three times.

The generic names of drugs should be used.

Generally, SI units should be used; where they are not, the SI equivalent should be included in parentheses.

Footnotes are not allowed, except table footnotes.

Statistics

Methods of statistical analysis should be described in language that is comprehensible to most readers. Raw data for the studies may be asked at any time up to 5 years after publication of research in the *JGCR* and the authors are suggested to keep these safe.

Proofs

A proof will be sent to the corresponding author of an article which should be sent back within 7 days.

Copyright

Copyright of all the published papers is retained by the authors.

Contributors form

On acceptance of the paper for publication, all authors should submit a contributor's form to the Geriatric Care and Research Organisation (GeriCaRe) regarding adherence to publication ethics.

Article Processing Fee

There is no submission, processing or publication fee at present for papers published in the *JGCR*.

Open access

All papers published in the *JGCR* are freely available for the readers.

GeriCaRe

GeriCaRe (Geriatric Care and Research Organisation) is involved in the care of the elderly and research in various aspects relevant to old age with an overarching aim of improving the quality of life of older adults. It endeavours to provide evidence based information for caregivers, elderly and the health care professionals about age related issues and to support life-long-learning through educational programmes for professionals and carers..

For its activities, GeriCaRe has been received the Vayoshreshtha Samman, an Indian National Award in 2016 as the 'Best Institution for Research in the Field of Ageing' by the President of India.

Sharing knowledgebase and making the research evidence utilisable in the community is a key focus of GeriCaRe. It conducts and supports various research and development projects in various disciplines including health, psychology, sociology and other allied fields.

It prepares and distributes public-education materials. Journal of Geriatric Care and Research (JGCR) is one of its flagship endeavours. The JGCR is free to readers and authors and is distributed worldwide.

Donate

GeriCaRe is supported by its members, a number of experts and volunteers who contribute their time and expertise freely.

GeriCaRe requires financial support to carry on its activities. It depends upon the contribution from the individuals and organisations. You will be able to help by sponsorships.

You can sponsor any of the activities, e.g. Health Camps, Health Care Initiatives, Journal of Geriatric Care and Research, or Research and Development Projects.

If you are a business organisation, you can support GeriCaRe as one of your corporate social responsibility (CSR) activities. Considering the wide ranging issues that GeriCaRe addresses you will be able find many reasons to support.

GeriCaRe ensures that all the contributions are best utilized for the cause they are donated for.

As a token of appreciation of your donation, GeriCaRe will send you the e-copies of JGCR. If requested it will also provide the donors an annual review of health with action plans for a chosen older adult, if the clinical details are shared.

Preferably, please consider setting up a direct debit at least yearly (or more frequently if you wish) which will help GeriCaRe in planning its activities; however onetime payments are also welcome. For payment instructions or further information on donation, please contact org.gericare@gmail.com or jgcr.gericare@gmail.com.

Geriatric Care and Research Organisation (GeriCaRe)

Journal of Geriatric Care and Research
2021, Volume 8, No 2