

Original Research Article

Geriatric research in Saudi Arabia: A Bibliometric Analysis

ABSTRACT

Background: This bibliometric analysis was performed to assess the research trends and productivity from Saudi Arabia in the field of geriatrics.

Methods: In this descriptive study, we collected bibliometric data for manuscripts published from Saudi Arabia between the year 1980 to June 2018. Data were retrieved from PubMed; Embase; MEDLINE; CINAHL; and Google Scholar using the Medical Subject Headings (MeSH) terms: “Saudi”, “Elder”, “Older”, “Gerontology”, “Seniors”, “Senility” “Geriatric” and “Ageing”. The number of published papers overall and citations per paper were also collected.

Results: from the publications analyzed between the year 1980 to June 2018, 91% of the articles were published between the years 2000 -2018, indicating the major contribution from Saudi Arabia in the field of geriatric research has been in the recent 20 years. In total, 34 publications were retrieved, of which, 85% were cross-sectional studies, with 66% of the studies carried out in hospitals or primary health care centers. The sub-topics with maximum number of publications included mental health, musculoskeletal health, and socio-gerontology. The most cited publications were related to the topics of depression, psychosocial health and osteoporosis.

Conclusions: Despite the recent increase in geriatric research in Saudi Arabia, the research output and quality of publications were low and did not address commonly seen geriatrics health conditions such as dementia, delirium and polypharmacy. More high quality research directed to address common geriatrics conditions is needed to better inform decision making. **Building**

research capacities, enhancement of infrastructure, and provision of adequate support from funding bodies are required interventions to enable geriatric research in Saudi Arabia to operate at a maximum efficiency.

Keywords

Geriatrics, Bibliometric, Saudi Arabia, Gerontology, Demography, Public health

Introduction

With the change in demographic profile of the world population, research trends indicate a growing interest in the evaluation and understanding of the commonalities and diversities with respect to the health status of older adults in different regions of the world [1, 2] . World agencies such as the WHO (World Health Organization) and the United Nations (UN) have emphasized the increase in the number of older adults and change of demographic profiles in the Arab countries. According to the estimates, elderly population aged 60 years and above is projected to increase to over 18% of the total population of Saudi Arabia by the year 2050 [3]. With increased life span and decreased fertility rates in Saudi Arabia, there is bound to be a demographic shift, calling for attention from research perspectives as well as health front.

While the Western world contributes to a majority of research investments in healthcare field, Arab countries have lagged behind in the number of original research publications and citation frequency according to a recent analysis [4]. It has also been reported that Saudi Arabia contributes to around 28% of the research publications, second only to Egypt. [4]

Despite the steep increase in published articles related to medical research in Saudi Arabia, there is a considerable gap in the scientific literature regarding the health status of older adults in Saudi

Arabia. This gap is a key to developing specific health programs for seniors as well as designing evidence-based public health policies and interventions in the future. Although, the Saudi National Survey for Elderly Health (SNSEH) has been helpful in enlisting some of the health characteristics of older adults population [5], the survey importantly helps in serving as a beacon for the future research directions in the field of geriatrics in Saudi Arabia.

In the present manuscript, a bibliometric analysis was conducted 1) to identify all research carried out in the field of geriatrics in Saudi Arabia and 2) to provide an understanding of research trends for future directions.

Methods

This was a descriptive cross-sectional study on geriatric health research in Saudi Arabia. Data were retrieved from electronic databases including PubMed (1940 to June 2018), Embase (1947 to June 2018), MEDLINE (1946 to June 2018), CINAHL (1935 to June 2018) and Google Scholar (2004 to June 2018). Medical Subject Headings (MeSH): “Saudi”, “Elder”, “Older”, “Gerontology”, “Seniors”, “Senility” “Geriatric” and “Ageing” were keyed into the databases to identify related articles. These were then abstracted after perusal of their abstracts and research topics. Their bibliographies were also looked over for additional literature. Finally, all the articles were closely evaluated to determine if they met the following selection criteria.

Selection criteria

Our study was restricted to publications, case reports and series, case control studies and cohort studies on geriatric health in Saudi Arabia from 1980 to June 2018. Only full text articles were reviewed. **Articles only written in English were selected.** In the event that data set was reviewed and published more than once, the latest version of the manuscript was chosen. Abstracts of

meetings and publications, newspaper articles, conference proceedings and book reviews were excluded. Studies done outside Saudi were also excluded from our review.

Data Analysis

Data was extracted, coded and summarized into an MS excel sheet (version 2010). The variables of interest included: a) title of the study, b) name of the first author, c) name of the first author's institutional affiliation, d) journal name, e) study design, f) research setting, and g) sample size. The number of published papers overall and citations per paper were also collected.

Results

Our literature search included research articles published from 1980 to June 2018 with 90.6% published between the year 2000 to 2018. A total of 34 articles were retrieved of which 2.9% were case report, 2.9% were literature reviews, 5.8% were systematic reviews, 5.8% were surveys using hospital records and population data and 82.3% were cross-sectional studies. The articles retrieved were original published work. Musculoskeletal health, mental health, and socio-gerontology were frequent topics of interest as illustrated in **Table 1**.

Table 1: Research topics in identified published articles in geriatric research

Research Topic	%(N)
Mental health	32.3 (11)
Socio-gerontology	20.6 (7)
Musculoskeletal health	20.6 (7)
Nutrition	11.8 (4)
Oral health	5.9 (2)
Diabetes	2.9 (1)
Chronic diseases	2.9 (1)
Morbidity	2.9 (1)
Total	100 (34)

The publications we identified were sourced from a variety of peer reviewed journals as illustrated in **Table 2**.

Table 2: Publications in geriatric research distributed by journal.

Journal Name	%(N)
Annals of Saudi Medicine	8.8 (3)
Journal of Family and Community Medicine	5.9 (2)
Saudi Medical Journal	5.9 (2)
Clinical Interventions in Aging	5.9 (2)
Eastern Mediterranean Health Journal	5.9 (2)
Gerontology and Geriatric Medicine	2.9 (1)
Saudi Pharmaceutical Journal	2.9 (1)
BMJ Open	2.9 (1)
International Journal of Medical Science and Public Health	2.9 (1)
MOJ Gerontology and Geriatrics	2.9 (1)
Dementia and Geriatric Cognitive Disorders	2.9 (1)
Merit Research Journal of Medicine and Medical Sciences	2.9 (1)
BMC Geriatrics	2.9 (1)
The Journal of Ageing Research and Clinical Practice	2.9 (1)
International Journal of Health Sciences	2.9 (1)
Open Journal of Stomatology	2.9 (1)
Middle East Journal of Family Medicine	2.9 (1)
Middle-East Journal of Scientific Research	2.9 (1)
European Journal of Research in Medical Services	2.9 (1)
Journal of Physical and Therapy Science	2.9 (1)
Journal of American Science	2.9 (1)
International Journal for Aging and Human Development	2.9 (1)
Journal of Cross-Cultural Gerontology	2.9 (1)
King Saud University Journal of Dental Sciences	2.9 (1)
Journal of Gerontological Nursing	2.9 (1)
International Journal of Geriatric Psychiatry	2.9 (1)
Neuropsychiatric disease and treatment	2.9 (1)
International Journal of Advanced Research	2.9 (1)
Total	100 (34)

Majority of the studies were conducted in hospitals and primary health care centers. Social centers such as senior homes were also frequent. Various research settings where different researches were conducted are illustrated in **Table 3**.

Table 3: Research setting of identified published articles in geriatric research

Research Setting	% (N)
Hospitals	35.3 (12)
Primary Health Care	32.4 (11)
Ministry of Health	2.9 (1)
Social centers	14.7 (5)
N/A*	14.7 (5)
Total	100 (34)

* Studies that utilized literature and systematic reviews as well as surveys.

King Abdulaziz University 25%, King Saud University 25%, and King Khalid University 9.4% were the most frequent institutions keen on geriatric research in Saudi Arabia. Institutions based in Australia, the United Kingdom, USA and Canada also contributed towards geriatric research in Saudi Arabia as illustrated in **Table 4**.

Table 4. Illustrating author contribution, institutional affiliation and citation analysis of reviewed literature.

1 st Author	Publication	Institutional Affiliation	Citation
AboelFetoh N [6]	Diabetes Mellitus Among Elderly Population in Arar City	Northern Border University, Arar, Saudi Arabia	0
Abolfotouh MA [7]	Psychosocial Assessment of Geriatric Subjects in Abha City, Saudi Arabia.	King Khalid University, Abha, Saudi Arabia	58
Abolfotouh	Central Obesity in Elderly	Alexandria University, Egypt	30

MA [8]	Individuals in South-Western Saudi Arabia: Prevalence and Associated Morbidity		
Al-Modeer MA [9]	Profile of Morbidity Among Elderly at Home Health Care Service in Southern Saudi Arabia	Alexandria University, Egypt	16
Al-Shammari SA [10]	Appraisal of Critical, Psychosocial, And Environmental Health of Elderly in Saudi Arabia: A Household Survey	King Saud University, Riyadh, Saudi Arabia	22
Al-Shammari SA [11]	Prevalence and Correlates of Depression Among Saudi Elderly	King Saud University, Riyadh, Saudi Arabia	129
Al-Shammari SA [12]	The Burden Perceived by Informal Caregivers of the Elderly in Saudi Arabia	King Saud University, Riyadh, Saudi Arabia	0
Al-Shehri SA [13]	Oral Health Status of Older People in Residential Homes in Saudi Arabia	King Saud University, Riyadh, Saudi Arabia	12
Al-Sinaidi AA [14]	Periodontal health and oral hygiene practice of elderly Saudis living at Riyadh Nursing Home	King Saud University, Riyadh, Saudi Arabia.	3
Alamri BH [15]	Health Professionals' Knowledge and Attitudes Toward Older People in Primary Care in Saudi Arabia	Flinders University, Adelaide, South Australia	0
Alamri SH [16]	Depression and associated factors in hospitalized elderly: a cross-sectional study in a Saudi teaching hospital Sultan.	King Abdulaziz University, Jeddah, Saudi Arabia	7
Alamri SH [17]	Delirium and correlates of delirium among newly admitted elderly patients: a cross-sectional study in a Saudi general hospital Sultan	King Abdulaziz University, Jeddah, Saudi Arabia	0
Alamri SH [18]	A low dose of risperidone resolved Charles Bonnet syndrome after an unsuccessful trial of quetiapine: a case report	King Abdulaziz University, Jeddah, Saudi Arabia	1
Alanazi AM [19]	Musculoskeletal Diseases in Elderly Population of Arar City, Kingdom of	Northern Border University, Arar, Saudi Arabia	0

	Saudi Arabia: A Cross-Sectional Study		
Alkhunizan M [20]	Prevalence of Mild Cognitive Impairment and Dementia in Saudi Arabia: A Community-Based Stud	King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia	0
Almegbel FY [21]	Period Prevalence, Risk Factors and Consequent Injuries of Falling Among the Saudi Elderly Living in Riyadh, Saudi Arabia: A Cross-Sectional Study	King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia	0
Alsaif A [22]	The Prediction of Falls Among Older People in Saudi Arabia.	King Abdulaziz University, Jeddah, Saudi Arabia	9
Alsaif A [23]	Balance and Prevention of Fall Among Elderly	King Abdulaziz University, Jeddah, Saudi Arabia	0
Alsenany S [24]	Assessment of Physical Health Status and Quality of Life Among Saudi Older Adults	King Abdulaziz University, Jeddah, Saudi Arabia	7
Alsufiani H [25]	Dietary Patterns, Nutrient Intake and Nutritional and Physical Activity Status of Saudi Older Adults: A Narrative Review	Newcastle University, UK	3
Altamimi T [26]	Healthy Aging Conceptualizations in Saudi Arabia: A Systematic Review	University of Hail, Hail, Saudi Arabia	2
Alzahrani SH [27]	Prevalence of Malnutrition and Associated Factors Among Hospitalized Elderly Patients in King Abdulaziz University Hospital, Jeddah, Saudi Arabia	King Abdulaziz University, Jeddah, Saudi Arabia	14
Alzahrani SH [28]	Prevalence and factors associated with geriatric malnutrition in an outpatient clinic of a teaching hospital in Jeddah, Saudi Arabia	King Abdulaziz University, Jeddah, Saudi Arabia	6
AlZarea BK [29]	Prevalence and Pattern of The Elongated Styloid Process Among Geriatric Patients in Saudi Arabia	AlJouf University, Sakaka, Kingdom of Saudi Arabia	0
El-Desouki MI	Osteoporosis in Postmenopausal	King Khalid University, Abha,	87

[30]	Saudi Women Using Dual X-Ray Bone Densitometry	Saudi Arabia	
El-Fetoh N [31]	Psychiatric Problems Among Geriatric Population of Arar City, Kingdom of Saudi	Northern Border University, KSA	0
Ghazwani EY [32]	Depression Among Elderly Subjects Attending Primary Health Care Centers in Abha City, Kingdom of Saudi Arabia	King Khalid University, Abha, Saudi Arabia	0
Jarallah JS [33]	Factors Associated with Health Perception of Saudi Elderly	King Saud University, Riyadh, Saudi Arabia	13
Karlin NJ [34]	Aging in Saudi Arabia: An Exploratory Study of Contemporary Older Persons' Views About Daily Life, Health, and the Experience of Aging. 2016;	University of Northern Colorado, Greeley, USA	10
Khoja AT [5]	The Health of Saudi Older Adults; Results from the Saudi National Survey for Elderly Health	Al Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia	0
Mansour A [35]	Research Concerns. Aging as Perceived by Saudi Elders.	University of Saskatchewan, Saskatoon, Saskatchewan, Canada	4
Rasheed A [36]	Alzheimer's Disease from The Perspectives of Saudi Elderly People	Security Forces Hospital Program, Riyadh, Saudi Arabia	0
Saquib N [37]	Chronic Disease Prevalence Among Elderly Saudi Men.	Qassim University, Buraydah, Saudi Arabia	0
Vennu V [38]	Cross-Cultural Adaptation and Validation of The Arabic Version of The Physical Activity Scale for The Elderly Among Community-Dwelling Older Adults in Saudi Arabia	King Saud University, Riyadh, Saudi Arabia	0

Majority of the reviewed publications (n=13; 38.2%) were cross-sectional studies with sample sizes below 200. Only 6 studies included a sample size of 1000 or more patients as illustrated in **Table 5**.

Table 5. Illustrating distribution of sample sizes in the published literature.

Sample Size	%(N)
0-200	38.2 (13)
201-400	20.6 (7)
401-600	2.9 (1)
601-800	0
801-1000	11.8 (4)
Over 1000	17.6 (6)
N/A	8.8 (3)

Discussion

In summary, this paper used bibliometric analysis to describe the research productivity from Saudi Arabia in the field of geriatric medicine. it showed a small number of articles have been published in this field. About 75% of these articles evaluated sociological, musculoskeletal, and mental health issues and did not address the major diseases that involve the elderly. The publications occurred in a diverse group of journals with a diverse group of authors. Three clinical centers contributed to about half the publications. The impact factor of these articles was generally low and the most cited papers were on depression [11], psychosocial analysis [7] and osteoporosis [30]. Most studies contained less than 400 patients and there have been no

randomized controlled trials of geriatric patients performed in Saudi Arabia. Most publication on geriatrics from Saudi Arabia have been contributed by researchers in Saudi Arabia, highlighting the contribution of local institutions and research bodies. Some research articles have been contributed by researchers in the US as well as the WHO.

This is the first paper to evaluate geriatric research in Saudi Arabia using bibliometric analysis. This could not find any studies that specifically focused on the concepts of healthy or successful aging in Saudi society as seen in other published studies in the field. The articles analyzed over the past 30 year period either deal with demographic and epidemiological outcomes or examine attitudes to care, or social integration [26]. Very few studies investigated chronic diseases such as diabetes among elderly population. Studies investigating the nutritional status of the elderly were also limited, as were investigations into other diseases such as cancer and cardiovascular diseases. This is probably due to limited funding and insufficient research capacity and capabilities [39]. Even though research articles on dementia and delirium were conducted, very little of the data were cited in other research. The opportunity to expand research in these areas should be considered a major focus in the future as well.

One of the key limitations of the manuscript includes the small number of manuscripts published from Saudi Arabia. Future research should use additional document types to construct a data set. It should also increase the number of most cited references for author network analysis to more profoundly understand this topic.

Conclusions

Despite the slight increase in geriatric research in Saudi Arabia over the last decade, the research output and quality of publications were low and did not address commonly seen geriatrics health conditions such as dementia, delirium and polypharmacy. More high quality research directed to address those conditions is needed to better inform decision making. **Building research capacities, enhancement of infrastructure, and provision of adequate support from funding bodies are required interventions to enable geriatric research in Saudi Arabia to operate at a maximum efficiency.**

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