# Financial Aspects of Elderly Care that Enhances their Quality of Life: A Scientometric Review

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#### **ABSTRACT**

This research paper investigates the citation patterns of financial aspects of elderly care that enhances their life. The study examines the citation patterns in a large corpus of peer-reviewed articles in the Scopus database. A total of 255 articles were included for this review. VOSViewer was employed to analyse citation information from the literature. This study examines the journals that are frequently cited, co-authorship and term occurrence in citations. Overall, our scientometric findings shows that there is exponential growth of literature with expanded international collaborators regarding financial issues toward quality caregiving, and the most term occurrence focused on patient, cost, and service. This study offers valuable insights for researchers in the field of quality aged care and the caregiving industries, enabling them to identify emerging research areas and make informed decisions in relation to the financial aspects of this type of care. By utilizing this approach, researchers can enhance their understanding of highly referenced material, strengthen the impact of their research for funding purposes, explore new and evolving areas in this topic, and identify potential collaborators.

Keywords: Quality care, Financial, Quality of life.

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**Received:** 10-07-2023; **Revised:** 02-08-2023; **Accepted:** 26-09-2023.

#### INTRODUCTION

Quality care is where we ensuring optimal healthcare services for older individuals, and paramount to safeguarding their overall sense of well-being and satisfaction with their quality of life. Health and palliative care providers confront unprecedented hurdles in addressing the growing array of beliefs and practices surrounding end-of-life matters. To counteract these challenges, initiatives like the Acute Care for Elders (ACE) programs have proven instrumental in enhancing outcomes for older adults by reducing associated costs and hospital stays. [1] Similarly, the Geriatric Resources for Assessment and Care of Elders (GRACE) model is used by the primary care providers and patient-centered medical homes for their in-home geriatric care management, with a focus on addressing geriatric syndromes and psychosocial issues prevalent among older adults. [2] GRACE has exhibited positive results by elevating the quality of care while curbing acute care utilization among economically vulnerable, high-risk older individuals. The significance of delivering high-quality medical care to older adults cannot be overstated, as demonstrated by the

**DOI:** 10.5530/jscires.12.3.067



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positive impact of programs such as ACE and GRACE. As an illustration, individuals hailing from disadvantaged backgrounds in the United Kingdom encounter barriers that impede their access to and referral for palliative care, thereby exacerbating their limited understanding of such services. [3] Simultaneously, addressing systemic deficiencies in ensuring timely access to healthcare is imperative, given the potential grave repercussions. It is crucial for health and palliative care providers to proactively address the complexities associated with catering to a diverse and evolving population.

Finance encompasses the management of money, investments, and financial resources, where it plays a crucial role in personal contexts. The well-being of older individuals in medical care can be significantly impacted by financial considerations. However, Purser *et al.* (2019) opined that the existing model of aged care is built upon flawed assumptions perpetuating negative and ageist stereotypes in their study about aging and older Australians. [4] To enhance the quality of care, aged care should prioritize the well-being and autonomy of individuals, focusing on their active participation rather than viewing them as passive recipients. Implementing a culture change within long-term care facilities is a viable approach to empower residents in decision-making and improve their quality of life. [5] Given the limited influence of state intervention on demographic processes through healthcare, optimization and exploration of financial and material resources





become imperative. [6] Moreover, enhancing the performance of hospices is an urgent moral, medical, and financial imperative, driven by the shared objective of fulfilling hospice's fundamental duty to uphold the quality of life until the end. [7]

To the best of the authors' knowledge, no such scientometric review on financial perspective for eldercare has been conducted on both quality care and quality of life. The definition of quality care is the ability of health services to contribute to the intended health outcomes for both individuals and communities. [8] While quality of life is defined as an 'individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. [9] Therefore, the aim of this paper is to examine the financial aspects of quality care that leads to a quality of life for the elderly. We evaluate the patterns of publication by examining leading authors, international collaborations, productive journals, and term occurrence. Additionally, we seek to identify specific research areas that have emerged through analyzing these patterns.

#### **METHODOLOGY**

Bibliometric analysis is a quantitative research method used to analyse and evaluate scientific literature and scholarly publications. This involves creating a citation graph, which represents the connections between different documents such as publication records, citations, and co-authorship networks. Additionally, bibliometrics is utilized to comprehensively examine the influence of a specific field, a group of researchers, or a particular paper within a specific research area. [10] Bibliometric analysis allows to track the development of a research field, and identify emerging trends and gaps in the literature.

## Data sources and selection criteria

A comprehensive search was performed on Scopus Elsevier. To mitigate potential bias resulting from daily updates of the databases, the search was conducted on a single day. Specifically, the literature retrieval from each database was carried out on 19 May 2023. The following search keywords were applied: (financial) AND (quality care) AND (elder\*). Searches were run by 'TITLE-ABS-KEY' string. Similar studies have also used similar count of keywords for optimal search of documents. [11-13] The exported publications subsequently proceed for screening.

The inclusion criteria were applied to conduct a comprehensive evaluation of the articles' content. Those articles that met the criteria were categorized and subjected to independent assessment by two authors for final inclusion or exclusion. Any disparities were resolved through careful re-reading and discussions until a consensus was achieved. Only research and review articles that were pertinent to the topic of interest were retained, while articles that did not meet the inclusion criteria were not taken into

consideration. After concurrent screening, 255 publications were included for analysis and 1459 eliminated due to unrelation and out-of-topic coverage. Beside this, five duplicates, two retracted articles, and 92 non-article type publications were excluded along with it as shown in Figure 1.

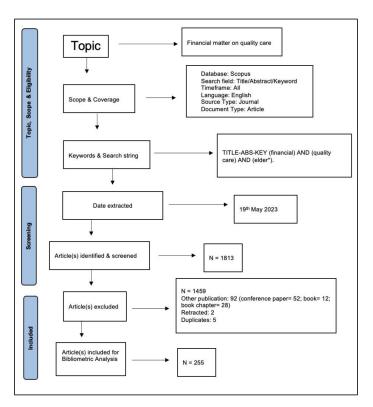
# **Data extraction and analysis process**

Simultaneously, the data extraction and study selection were carried out by two reviewers. Consensus was reached to resolve disagreements or to submit them to a third review author. To conduct bibliometric and visual analysis by exporting complete records and cited references from the Scopus database. This included information such as authors, author's IDs, titles, publication years, source title, volume, issue, article number, page start, page end, page count, number of citation count, doi number, document type, source, and other information. The exported records were then imported into Zotero (v.6.0.26) for screening process. Subsequently, Microsoft Excel (v.16.72), VOSviewer (v.1.6.19), and IBM SPSS Statistics (v.26) were utilized for further analysis and visualization.

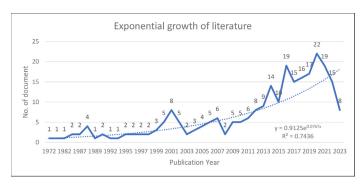
## **RESULTS**

# Price's Law: Exponential growth of science

This section explains the Price's Law analysis based on included articles conducted with Microsoft Excel. Price's law, commonly applied to the growth of scientific literature, suggests that half



**Figure 1:** Flow diagram of search strategy.



**Figure 2:** Publication trend regarding financial aspects of quality care related to quality of life for older people.

of the publications originate from the square root of all authors. According to Price (1986), scientific development adheres to exponential growth, where the rate of growth is proportional to the existing magnitude—an indication that larger entities expand more rapidly. Consequently, as scientific knowledge accumulates, the pace of discovery and innovation accelerates, leading to an exponential growth pattern in scientific literature correlated to the total amassed knowledge. It is evident from the data that the quantity of published articles between 1972 to May 2023 in the field of quality care and quality of life has demonstrated a remarkable exponential growth trend as depicted in Figure 2. The exponential growth pattern is evident with a strong fit of 74.3% (R²) and a notable growth rate of around 0.91 (2 d.p) per year.

## **Bradford's Law of Scattering**

Bradford's Law is a bibliometric principle that characterizes the distribution of scientific journals and articles within a specific field. [17] It establishes that the number of journals within this field can be categorized into three distinct zones: the core zone, the middle zone, and the tail zone. According to this law, the number of journals in the middle zone will be n times greater than the number in the core zone, while the number in the tail zone will be n2 times larger than the core zone. [18] Zone calculation was done by dividing the total cumulative frequency by 3 – see Table 1. [19]

Table 2 shows the journal metrics of core journalsconsisting citation scores and impact factors provided from Scopus and Journal Citation Reports\* (JCR) Clarivate respectively. The most prolific journal is the *Journal of American Geriatrics Society*. The impact factor ranges from 2.9 to 7.8; where the Journal of the American Medical Directors Association has the highest score. Journals with a Journal Citation Impact (JCI) of 1.5 exhibit a citation impact that is 50% higher than the average impact within their respective category. There are only two journals that have JCI more than 1.5 as shown. This metric can be employed in conjunction with other measures to assess and gauge the performance of journals. Surprisingly, *Journal of Oncology Practice* was discontinued (as shown in Scopus) thus the journal

Table 1: Journal distribution by Zone.

Bradford's Zone	No. of Journals	% Journals	No. of articles
1	23	12.8	84
2	70	39.1	85
3	86	48.1	86
Total	179	100	255

Table 2: Top 10 Zone 1 journals.

Journal	No. of papers <sup>1</sup>	2021 JIF <sup>2</sup>	2021 JCl <sup>3</sup>	SJR⁴	SNIP 2021 <sup>5</sup>	CiteScore 2021 <sup>6</sup>
Journal of the American Geriatrics Society	7	7.538	1.62	2.05	2.24	8.8
Journal of Aging and Social Policy	6	7.084	1.51	1.72	2.18	6.5
PLoS ONE	6	3.752	0.88	0.89	1.37	5.6
International Journal of Environmental Research and Public Health	6	4.614	0.93	0.83	1.44	4.5
Journal of the American Medical Directors Association	5	7.802	1.35	1.79	2.26	8.0
BMC Health Services Research	5	2.908	0.83	0.96	1.52	3.9
BMJ Open	4	3.007	0.73	1.06	2.29	3.9
International Journal for Equity in Health	4	4.673	1.09	1.55	1.91	5.4
Journal of Oncology Practice	3	3.714	0.57	0	N/A	N/A
Health Policy	3	3.255	1.01	1.06	1.74	5.2

Note: ¹amount of articles per included journal; ²2021 impact factor from Journal Citation Reports\*; ³2021 Journal Citation Indicator from Journal Citation Reports\*; ⁴SCImago Journal Rank 2022; ⁵Source Normalized Impact per Paper 2021; ⁶CiteScore 2021 from Scopus.

does not contain the 2021 citation score due to journal title changed in year 2020; but 2021 IF score can still be found via JCR. The graph plotted in Figure 3 shows that almost all of the

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Table 3: Most cited journal (>100 citation count).

Journal	No. article published	Total citation count
Controlled Clinical Trials	1	306
Journal of Rural Health	2	288
Health Affairs	3	284
Journal of Oncology Practice	3	283
Medical Care	2	228
Oncologist	3	225
Journal of Clinical Oncology	1	220
PLoS Medicine	3	200
Health Policy	3	177
Canadian Medical Association Journal	2	158
Age and Ageing	3	148
Journal of American Geriatrics Society	7	141
PLoS One	6	107
Journal of the American Medical Directors Association	5	106
Archives of Gerontology and Geriatrics	3	105

journals formed a U-shaped graph. Likewise, Table 3 list the 15 most cited journal with more than 100 citation counts. Based on the list, *Controlled Clinical Trials* has the highest, and the *Archives of Gerontology and Geriatrics* has the lowest.

## **Authorship analysis**

VOS viewer (v.16.19) software is employed for conducting bibliometric mapping analysis, aids in the generation and presentation of knowledge structures, providing a valuable means of visually representing extensive datasets in an intuitive manner. [20] Utilizing this tool, we constructed visual networks showcasing author co-authorship and keyword co-occurrence. In these visual maps, the magnitude of nodes corresponds to the frequency of item occurrences, while the connections between nodes depict the relationships of co-occurrence or co-authorship. Diverse colours of nodes and lines indicate either the average appearance years or distinct clusters within the network.

Co-authorship analysis indicates the collaboration between authors. This analysis helps on identifying patterns of collaboration between authors by visualizing a network where authors are represented as nodes and links indicating collaboration.

Figure 4 illustrates the co-authorship analysis on "authors" unit; where there are only four different cluster that show relationship – total link strength = 1, while the other does not display joint publication. The following authors are identified in Figure 4b.

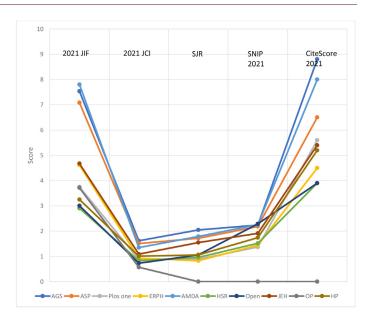
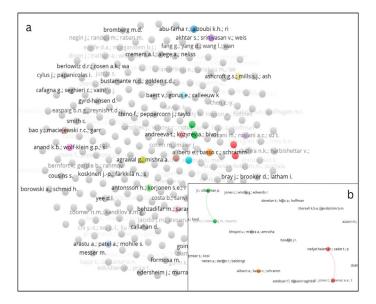


Figure 3: Zone 1 Plot by Top 10 Zone 1 journal arrangement.



**Figure 4:** Author's connection by a) network visualization, b) connection observed.

Note: Setting used are Authors; Full counting; Min. no. docs/author= 1; Min. no. citation/author= 0.

Table 4 below is correlated to Figure 4 delineating the author's connection of two coloured-cluster observed in Figure 4b. This table state the relating authorship in cited articles.

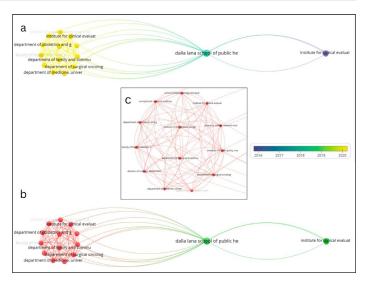
Figure 5 only show the largest set of connected items consists of 17 items due to absence of link among the remaining. The network visualization in Figure 5b depicts the clusters of author's organization according to the total link strength; where we can observe that red cluster in Figure 5c are more closely interlinked and contemporary per Figure 5a. It can be deduced that the focus on quality care particularly around year 2020 mostly by authors from the Western countries.

Table 4: h-index and Affiliation based on Scopus database and the most recent publication respectively.

recent publication respectively.							
Colour cluster	Author(s)	<i>h</i> -index	Affiliation				
Green	Pam Silberman	11	University of North Carolina Gillings School of Global Public Health.				
	Rachel Dolin	3	David A. Winston Health Policy Fellowship.				
	Mark G. Holmes	31	The University of North Carolina at Chapel Hill.				
	Sally C. Stearns	40	The University of North Carolina at Chapel Hill.				
	Denise A. Kirk	2	The University of North Carolina at Chapel Hill.				
	Laura C. Hanson	50	The University of North Carolina at Chapel Hill.				
	Donald H. Taylor	38	Duke University.				
Red	Frances R. Nedjat-Haiem	13	San Diego State University.				
	Tamara J. Cadet	13	Harvard School of Dental Medicine.				
	Humberto Parada	20	Moores Cancer Center.				
	Tessa M. Jones	3	Silver School of Social Work, New York University.				
	Elvira E. Jimenez	17	VA Greater Los Angeles Healthcare System.				
	Beti Thompson	43	Fred Hutchinson Cancer Research Center.				
	Kristen J. Wells	28	San Diego State University.				
	Shiraz I. Mishra	32	Comprehensive Cancer Center, University of New Mexico.				

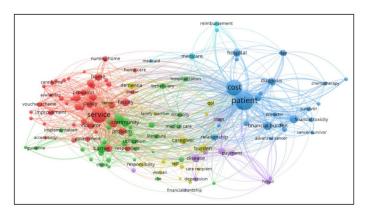
## **Term co-occurrence**

According to Figure 6a, words such as 'cost', 'patient', 'service', 'financial burden', and 'caregiver' are some of the terms that can be observed on first hand. This is due to they have higher occurrence rate: often mentioned in the title and abstract of 225 publications. Figure 6a show the network visualization of the terms. The red area is associated with healthcare services and policies related to providing aged care, whether in nursing homes or residential care. The green area is associated with access to care and barriers, particularly regarding hospitalization costs. The yellow area focuses on caregivers and their role in providing care services to improve the quality of life, connecting to other areas, mostly red and blue. The blue area represents the patient's



**Figure 5:** Organization's connection by a) overlay visualization, b) network visualization, c) most connection observed.

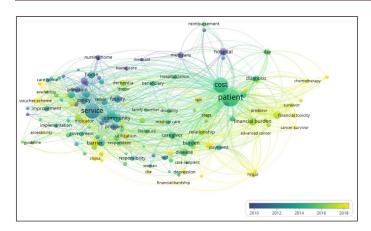
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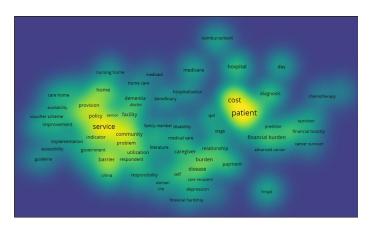
**Figure 6a:** Network visualization of term occurrence based on title and abstract.

perspective, encompassing factors such as care services, financial aspects, and hospitalization treatments. It stands out as the most prominent term linking to all coloured areas. The turquoise area relates to reimbursement and Medicare concerning healthcare services for patients. Finally, the purple area is associated with the health-related quality of life of patients. The overlay visualization in Figure 6b shows that authorship toward financial aspect of quality care for aged care were raised since year 2010. This is due to doubling of aging population and increment of aged care service demand. Such factors lead to unsustainable cost and proper financial planning would be essential. Figure 6c is the density visualization on co-occurrence of term mentioned, where cost, patient, and service are mentioned more often.

Table 5 presents the top 20 terms (from 131 terms in total) that appeared most in title and abstract of the 255 articles. The table also shows that these top 20 terms are mostly appear in 2009 or later. The list of the keywords also contains generic keywords such



**Figure 6b:** Overlay visualization of term occurrence based on title and abstract.



**Figure 6c:** Density visualization of term occurrence based on title and abstract.

Note: The setting was followed by default, for which the minimum number of occurrences of a term is 10 and 60% of most relevant terms in full counting will be illustrated.

as "problem" – which could indicate medical issue on older adult, or issue raise in caregiving, and "home" – which may indicate homecare settings, in-house caregiving, and/or home caregivers. The number of occurrences and relevance does not seem to corelate. We, therefore, explore the further total 131 terms that examine whether selected terms very connected to older people and financial aspects were affected by occurrence or relevance, this is shown in Table 5.

From Table 6, we found 35 terms that were really exemplifies this topic. Examples of these terms are cost, elderly care, financial burden and insurance. The term occurrence related to topic of interest was not significant due to difference in scores for occurrence (M= 31.29, SD= 41.33, t= 0.49, p= 0.627, two-tailed) but was significant to relevance (M= 1.22, SD= 0.60, t= -2.65, p< 0.01, two-tailed). The magnitude of the differences, for occurrence, in the means (mean difference= 4.037) was very small (eta squared= 0.002) while for relevance (mean difference= -0.31) was also very small (eta squared= -0.06).

Table 5: Top 20 terms that appeared the most in title and abstract.

Term	Occurrences	Relevance	Average published year
Patient	356	0.66	2014
Cost	252	0.58	2014
Service	241	0.40	2012
Access	88	0.38	2013
Barrier	75	1.07	2017
Financial Burden	72	1.33	2016
Community	72	0.45	2013
Cancer	69	1.54	2017
Country	67	0.48	2011
Disease	63	0.33	2015
Hospital	62	0.64	2009
Caregiver	61	0.68	2014
Burden	61	0.50	2014
Policy	60	0.72	2011
Facility	59	0.73	2012
Older person	56	0.64	2012
Elderly person	55	0.97	2013
Approach	55	0.49	2013
Home	54	0.69	2012
Problem	52	0.62	2011

Note: The terms are presented in descending order based on occurrences.

## DISCUSSION

Quality care for elders is a crucial aspect of healthcare, particularly considering the increasing elderly population and their unique healthcare needs. [21] Quality care that emphasises on the quality of life is even more pertinent. However, financial constraints often pose significant barriers to accessing and providing quality care that enhances the quality of life for the elderly. Our study found several insights into the literature that focuses on these three areas.

First, multiple studies have identified various barriers to accessing quality care for older adults, with financial constraints being a prominent factor. Rural elders, in particular, face limited access to healthcare due to transportation difficulties, limited healthcare supply, and lack of quality healthcare services. [22] A qualitative study conducted in rural West Virginia communities revealed that financial constraints were one of the key barriers reported by older adults when accessing needed healthcare. These financial constraints not only affect their ability to afford healthcare services but also contribute to social isolation and limited healthcare supply. [22]

Table 6: t-test on term occurrence related to topic of interest.

		N	Mean	Std deviation	Std error	t	р
Occurrence	Unrelated to topic	96	35.32	43.19	4.41	0.49	0.627
	Related to topic	35	31.29	41.33	6.98		
Relevance	Unrelated to topic	96	0.92	0.58	0.06	-2.65	0.01
	Related to topic	35	1.22	0.60	0.10		

Second, a substantial correlation was found between a lack of financial means and more discomfort, a heavier load of symptoms, and a lower quality of life. [23] The negative effects of financial load on patient well-being was constant across several well-being variables and persisted even after accounting for other clinical considerations. These findings highlight the importance of managing financial stress in order to improve the quality of treatment and overall outcomes for older persons living with cancer. [24,25]

Third, financial strain has an impact on patient satisfaction with healthcare services in addition to its effect on patient well-being. [26] According to research, an increased financial load has a negative impact on overall satisfaction, contentment with the technical quality of care, and satisfaction with the financial elements of care. By addressing the financial burden that patients endure, there is the possibility for greater satisfaction, adherence to treatment, and overall quality of life. Patients have shown a significant desire for open talks about the expenses of their care, emphasising the need of addressing this aspect in clinical settings. [27]

Finally, informal carers make a significant contribution to meeting the quality care that enhances the quality of life for the elderly. Nonetheless, financial restrictions typically limit their ability to hire hired specialists or assistants, limiting the degree of care they can give. [28] Carers often have challenges related with sophisticated medical obligations, such as medication administration, which can lead to mistakes owing to a lack of expert help. Giving carers more help and direction has the potential to reduce their financial burdens while also encouraging the delivery of great care in the home setting. [29]

## **Implications**

Understanding financial barriers can inform policy and healthcare delivery systems to improve access to quality care for rural elders. [30] Future research can focus on developing targeted interventions to address transportation difficulties, limited healthcare supply, and social isolation in rural areas. Other than that, patients with inadequate financial resources reported more pain, more symptom load, and a lower quality of life. These findings emphasise the importance of supporting treatments that address the financial obstacles that cancer patients confront in order to improve their overall well-being.

Additionally, high-cost consumers of health-care resources reveals information about the concentration and characteristics of persons who use a considerable part of healthcare costs. This data may be used to build targeted interventions and resource allocation methods to enhance healthcare service management and efficiency. To satisfy their individual demands and lower healthcare expenses, different high-cost groups may require specialised methods.

Moreover, the influence of financial load on patient satisfaction in cancer care emphasise the need of taking financial elements into account in the entire care experience. Patient satisfaction with several elements of treatment, including overall contentment and satisfaction with technical quality of care, is severely impacted by high financial load. Integrating cost conversations and executing initiatives to reduce financial stress can help enhance patient satisfaction and overall cancer treatment quality.

## **Limitation and Future Research**

There are several limitations identified. Firstly, exclusion of certain variables during screening stage. For instance, exclusion of non-English articles. Secondly, there may be potential author bias as well such as in screening stage and interpretation. As this review aimed to focus on the financial aspects toward quality care, other paradox or specific items were not covered. Third, this review does not review the content analysis and hotspot studies on the elderly care at large. Our scope is much narrower: it examines the finance aspects of quality elderly care that enhances quality of life. Future research could focus on a full content analysis to locate the key research fronts in this area of research.

#### CONCLUSION

Overall, our scientometric findings shows that there is exponential growth of literature with expanded international collaborators regarding financial issues toward quality caregiving, and the most term occurrence focused on patient, cost, and service. Accessing healthcare treatments is significantly hampered by financial issues, which can increase the burden of symptoms, impair quality of life, and decrease patient satisfaction. Improving the financial burden older people and their carers is crucial for raising the standard of care as a whole. Improved elder care may be achieved through methods including patient-provider cost conversations, financial literacy interventions, and carer support programmes. Future

studies and policy initiatives should concentrate on creating all-encompassing strategies to reduce financial obstacles and support quality care that enhances the quality of life for elderly.

#### **ACKNOWLEDGEMENT**

This research is funded by Universiti Malaya's Impact-Oriented Interdisciplinary Research Grant (IIRG) IIRG003C-2022SAH.

## **FUNDING**

This work was funded by Universiti Malaya's Impact-Oriented Interdisciplinary Research Grant (IIRG); Grant number: IIRG003C-2022SAH.

## **CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest.

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Cite this article: Che Azmi A, Ooi KH, Ab Aziz N, Shahimi S, Lee WL. Financial Aspects of Elderly Care that Enhances their Quality of Life: A Scientometric Review. J Scientometric Res. 2023;12(3):691-8.