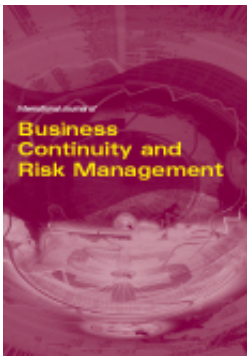

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TQM and hospital performance: a bibliometric analysis

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Abstract: This article aims to use bibliometric analysis to examine existing works and literature on TQM and performance to explore the concepts evolving journey since its conception. This study applies bibliometric approaches such as citation, co-citation, and co-occurrence of author keywords based on a bibliometric analysis of 137 publications extracted from the Scopus database between 2004 and September 2021. This research examines the kind and direction of research on TQM and hospital performance undertaken over the last few decades. It also identifies the most influential writers, journals, institutions, and countries concerning TQM and hospital performance. This study might provide academics and practitioners with detailed insights into the TQM and hospital performance concepts, which can subsequently be used as a reference for strategic efforts.

Keywords: total quality management; TQM; hospital; performance; bibliometric analysis; Scopus.

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1 Introduction

Hospital performance is a prominent concern in every country. Good performance is not only quality but also can control cost behaviour and can improve overall operational performance. However, many factors can affect a hospital's performance consisting of total quality management (TQM) practices. To enhance organisational performance and competitiveness, TQM is an approach widely used in various types of organisations. This includes improving the quality of outcomes and efficiency of healthcare delivery (Sabella et al., 2014).

TQM uses quality as a fundamental measurement metric, continuous improvement as a philosophy and employee engagement as an approach. In contrast to organisations other than healthcare where TQM is widely applied, services in healthcare organisations are intangible and ephemeral. Healthcare organisations must provide the services as early as possible when required that deal with intangibles such as individual preferences, making objective quality assessment difficult.

Only a few empirical studies have analysed the relationship between management accounting systems, controls, and strategies related to service quality and their impact on organisational performance in the hospital industry, particularly patient satisfaction (Pizzini, 2006). Moreover, many studies have found a link between the quality of hospital services and patient satisfaction (Duggirala et al., 2008). Customer (patient) satisfaction has received huge attention (Bitner et al., 1994; Oliver, 1997; Rust and Oliver, 1993).

This research aims to map or explore the possible practices of TQM that affect the performance of hospitals based on bibliometric analysis. Based on a comprehensive review of various researches, the dimensions of TQM in hospitals have been identified that involved physicians, nurses, paramedics and support staff at various levels within the hospital organisation. It is expected that the research findings will be useful for future studies in adopting which variables or factors of TQM are mostly related to the hospital's performance.

2 Literature review

2.1 TQM and hospitals

The TQM is first operationalised by Saraph et al. (1989), which is earlier called critical success factors. There are various factors related to TQM ranging between 4 and 12, despite the fact that these components have a similar core (Claver et al., 2003; Jaeger and Adair, 2016). Leadership commitment, staff involvement, customer focus, supplier connections, performance assessment, and continuous improvement are the most typical criteria being used (Teixeira et al., 2015; Aquilani et al., 2017). Additionally, Mosadeghrad (2013) stated that leadership and management, strategic quality planning,

quality culture, education and training, employee management, customer and supplier management, resource and information management, and management processes are used to achieve excellent results for the organisation, customers, employees, suppliers, and society.

The TQM techniques were used to assess different areas of hospital performance (Oliveira et al., 2019). However, the TQM practices in the manufacturing and services sectors are different significantly, although its implementation in service companies might not be successful (Oliveira et al., 2019). Moreover, the results of the relationship of TQM and performance are not consistent (Psomas et al., 2017); thus, more studies in different contexts should be conducted, particularly in the healthcare sector.

2.2 Hospital's performance measure

Hospital administration and management were shown to have a substantial influence on hospital performance in the study. Eggli and Halfon (2003) presented a simple model for measuring the growth of a quality management system in healthcare centres consisting of four elements (patients, activities, resources, and impacts) and six stages. According to Gibbons and Dhariwal (2003), good auditing procedures may be attained via leadership, structure, direction, and individual motivation.

As a result, the hospital's performance evaluation is an essential component in determining the quality of health treatment. Graham et al. (2005) looked at how to assess performance outcomes in medical centres to be analysed and emphasised efficiency and productivity, comparing patient care based on outcomes and value.

In the hospital sector, both healthcare quality and patient happiness was vital (Naidu, 2009). It is well acknowledged that customer satisfaction is influenced by service quality (Parasuraman et al., 1985, 1988, 1991; McDougall and Levesque, 2000). When the quality of hospital services meets a patient's expectations and demands, the patient is happy; as a consequence, patient satisfaction is higher (Chahal and Kumari, 2010). Furthermore, there is no agreement in the hospital industry on the relationship between service quality and performance (patient satisfaction) (Bell, 2004; Gill and White, 2009), but patient satisfaction is used as a proxy for assessing patient service quality (Turris, 2005).

Despite the extensive research on healthcare quality determinants (Badri et al., 2009), it may be claimed that there are currently insufficient methods to measure and manage healthcare quality (Chow-Chua and Goh, 2002). Although not conclusive, the service quality/satisfaction data is based on customer satisfaction surveys, such as those conducted in health marketing (Brady and Robertson, 2001; Andaleeb, 2001). Distinct notions are used to reflect satisfaction in many types of research (Rosenheck et al., 1997; Ygge and Arnetz, 2001). Meanwhile, they incorporated other satisfactions in their survey instrument by asking participants to indicate their satisfaction for each item that directly represented the quality of healthcare (Badri et al., 2009).

Because of the importance of health evaluation, performance must be assessed, particularly in service delivery and health systems. This may be the most immediate policy worry and sensitivity for most residents and decision makers, especially considering that health services account for substantial healthcare spending, which is impacted and affected by welfare, financing systems, and delivery.

Health is a primary need for most citizens, but facilities and resource requirements must be balanced. Therefore, service quality, effectiveness, use of resources, productivity, and efficiency must be tested and investigated, especially concerning social justice and access to each individual. This has become the focus of academics and is related to performance in the form of hospital services that are very concerned by all parties, which consist of aspects of health management and economics that can influence hospital policies.

3 Data collection

This research employed data from Scopus, a large database that numerous academics have extensively used for bibliometric analysis in various fields. Scopus was chosen mostly because of its size, roughly 60% larger than the Web of Science (WoS) database (Zhao and Strotmann, 2015). As a result, the authors searched the Scopus database for papers with the following titles: 'TQM practices', 'hospital performance' and 'TQM practices'. The study's examination is limited to the disciplines of 'business' and 'management', focusing on TQM and performance. The papers' publication dates vary from 2004 to 2021.

Furthermore, only publications and reviews published in journals written in English have been examined for this study, whereas conference papers were eliminated (see Table 1). A thorough review is done based on 137 selected articles. Moreover, a review or search query is based on the retrieved total of 137 articles that begins with searching for the indicated keywords in the parts of the journals, such as a title.

4 Research methodology

This study used a thorough bibliometric analysis to answer all of the pre-determined research topics. As seen in Table 1, bibliometric analysis reveals links between publications based on the number of times one article is quoted and referred by others.

Table 1 Search syntax on Scopus database

Data source	*Search syntax*
Search syntax on Scopus database	TITLE ('TQM PRACTICES' OR 'HOSPITALS' PERFORMANCE') AND (EXCLUDE (SUBJAREA, 'ENGI')) AND (EXCLUDE (SUBJAREA, 'BIOC')) AND (EXCLUDE (SUBJAREA, 'AGRI')) AND (EXCLUDE (SUBJAREA , 'MEDI')) AND (EXCLUDE (SUBJAREA, 'PSYC')) AND (EXCLUDE (SUBJAREA, 'DECI')) AND (EXCLUDE (SUBJAREA, 'EART')) AND (EXCLUDE (SUBJAREA, 'COMP')) AND (EXCLUDE(DOCTYPE, 'cp'))

Source: Author compilation

5 Results

5.1 General results

Table 2 shows a total of 137 publications published in 107 journals, written by 825 authors connected with 512 institutions in a total of 4,363 references from 55 nations. This summary depicts all of the publications that were examined in the area of TQM and hospital performance.

Table 2 General results

Summary of general results	
Criteria	*Quantity*
Articles	137
Journals	107
Authors	825
Institutions	512
Countries	55
Cited references	4,363

5.2 Number of publications per year

The number of publications on TQM and performance from 2004 to 2021 shows two interesting stages. First, from 2004 to 2014 as the beginning of the concept of TQM and performance in the healthcare or hospitals business. Publications in those years were the highest point in 2014 as well as in 2009. During the 2014–2021 period, there was an increase in the number of publications that were more than twice the initial stage. The year 2020 presents the highest number of publications compared to 2019 and 2015 (see Figure 1). However, up to 2021, the number of publications is on a downward trend.

Figure 1 Number of publications per year

Table 3 Most cited documents in TQM and hospitals' performance literature

Rank	*Title*	*Authors*	*Cited by*
1	Lean thinking to improve emergency department throughput at AORN Cardarelli Hospital	Improta, G., Romano, M., Di Cicco, M.V., Ferraro, A., Borrelli, A., Verdoliva, C., Triassi, M. and Cesarelli, M.	36
2	Effects of a multifaceted medication reconciliation quality improvement intervention on patient safety: final results of the MARQUIS study	Schnipper, J.L., Mixon, A., Stein, J., Wetterneck, T.B., Kaboli, P.J., Mueller, S., Labonville, S., Minahan, J.A., Burdick, E., Orav, E.J., Goldstein, J., Nolido, N.V. and Kripalani, S.	25
3	Standards for neurologic critical care units: a statement for healthcare professionals from the Neurocritical Care Society	Moheet, A.M., Livesay, S.L., Abdelhak, T., Bleck, T.P., Human, T., Karanjia, N., Lamer-Rosen, A., Medow, J., Nyquist, P.A., Rosengart, A., Smith, W., Torbey, M.T. and Chang, C.W.J.	24
4	Voices that matter: end-of-life care in two acute hospitals from the perspective of bereaved relatives 11 medical and health sciences 1117 public health and health services	Donnelly, S., Prizeman, G., Coimín, D.Ó., Korn, B. and Hynes, G.	17
5	Self-care practice and associated factors among diabetes mellitus patients on follow up in Benishangul Gumuz Regional State Public Hospitals, Western Ethiopia: A cross-sectional study.	Chali, S.W., Salih, M.H. and Abate, A.T.	13

5.3 The most cited documents

As depicted in Table 3, eight most cited documents have at least eight citations in the subject of TQM and performance. The documents are ordered by the number of citations they have got. Only five articles received at least ten citations which classified as having quality papers. The article by Improta et al. (2018) is the most cited article with 36 citations. Meanwhile, the papers by Schnipper et al. (2018) and Moheet et al. (2018) received more than 20 citations. Hence, these three articles are the most related to the TQM practices and hospital's performance that considered giving extensive contributions to the literature and practicality.

5.4 Most dominant authors

As depicted in Table 4 shows the most dominant authors in the TQM practices and hospital's performance subject. The writers' influence is determined by the number of publications they have written on TQM and performance and the number of citations they have gotten. In terms of the overall number of citations, Borrelli, A., Cesarelly, M., Di

Cicco, M.V., Ferraro, A., Improta, G., Romano, M. and Triassi, M. are the most dominant authors, with each of them receiving 36 citations.

Table 4 Most dominant authors (in terms of total citations received)

Rank	*Author*	*Document*	*Citation*
1	Borrelli, A.	1	36
2	Cesarelli, M.	1	36
3	Di Cicco, M.V.	1	36
4	Ferraro, A.	1	36
5	Improta, G.	1	36
6	Romano, M.	1	36
7	Triassi, M.	1	36
8	Verdoliva, C.	1	36

Table 5 Most dominant authors (in terms of average citation per document)

Rank	*Author*	*Document*	*Citation*	*Average citation per document*
1	Borrelli, A.	1	36	36
2	Cesarelli, M.	1	36	36
3	Di Cicco, M.V.	1	36	36
4	Ferraro, A.	1	36	36
5	Improta, G.	1	36	36
6	Romano, M.	1	36	36
7	Triassi, M.	1	36	36
8	Verdoliva, C.	1	36	36

As depicted in Table 5, shows that the average of citations per document led by Borrellia, A., Cesarelly, M., Di Cicco, M.V., Ferraro, A., Improta, G., Romano, M., Triassi, M. and Verdoliva, C. as the most dominant authors with 36 citations each per document respectively.

5.5 Most dominant journals

As depicted in Table 6, shows the most dominant journals have narrated about the concept of TQM and performance where the *BMC Health Service Research* has a higher rank with some published articles of 12 and followed by the *International Journal of Health Care Quality Assurance* and *International Journal for Equity in Health* with some published articles of 3, respectively. On the total number of citations received, the *BMC Health Services Research* attests as the most dominant journal with a total of citations of 58, followed by the *BMJ Quality and Safety* with a total citation of 25 and *Neurocritical Care* with a total citation of 24.

As depicted in Table 7 displays, the average number of citations received each paper, with the *BMJ Quality and Safety* journal ranking first with the average number of citations per article is 25, followed by *Neurocritical Care* with 24 average citations per article, and *BMC Palliative Care* with 17.

Table 6 Most dominant journals (in terms of the total article published)

Rank	*Journal*	*Article*	*Citation*
1	*BMC Health Services Research*	12	58
2	*BMJ Quality and Safety*	1	25
3	*Neurocritical Care*	1	24
4	*BMC Palliative Care*	1	17
5	*BMC Research Notes*	1	13
6	*Health Affairs*	1	9
7	*International Journal of Health Care Quality Assurance*	3	9
8	*International Journal for Equity in Health*	3	8
9	*Nurse Education in Practice*	1	8

Table 7 Most dominant journals (in terms of average citation per document)

Rank	*Journal*	*Article*	*Citation*	*Average citation per document*
1	*BMC Health Services Research*	12	58	4.8333
2	*BMJ Quality and Safety*	1	25	25
3	*Neurocritical Care*	1	24	24
4	*BMC Palliative Care*	1	17	17
5	*BMC Research Notes*	1	13	13
6	*Health Affairs*	1	9	9
7	*International Journal of Health Care Quality Assurance*	3	9	3
8	*International Journal for Equity in Health*	3	8	2.6667
9	*Nurse Education in Practice*	1	8	8
10	*American Journal of Medical Quality*	1	7	7

5.6 Most dominant institutions

As depicted in Table 8 shows the most dominant institutions that have published articles on TQM and performance. The institutions are plotted based on the authors who have published articles and received citations and affiliations with those institutions. Five institutions have the same total number of published articles with 36 citations, such as the University of Naples, University Magna Graecia of Catanzaro, Hospital Antonio Cardarelli, Scientific Clinical Institutes Maugeri IRCCS and the rest of institutions have the same number of citations of 25.

As depicted in Table 9, based on average number of citations per document, the University of Naples, University Magna Graecia of Catanzaro, Hospital Antonio Cardarelli, Scientific Clinical Institutes Maugeri IRCCS are the most dominant institution with 36 average citations per article.

Table 8 Most dominant institutions (in total citations received)

Rank	*Institution*	*Country*	*Document*	*Citation*
1	Department of Electrical Engineering and Information Technology (DIETI), University of Naples Federico II	Naples, Italy	1	36
2	Department of Medical and Surgical Sciences, University Magna Graecia of Catanzaro	Catanzaro, Italy	1	36
3	Hospital Antonio Cardarelli	Naples, Italy	1	36
4	Responsible for the Programming and Health Planning Unit, Hospital Antonio Cardarelli	Naples, Italy	1	36
5	Scientific Clinical Institutes Maugeri IRCCS	Telese, Italy	1	36
6	Center for Quality Improvement, Society of Hospital Medicine, Philadelphia	USA	1	25
7	Department of Biostatistics, Harvard School of Public Health, Boston, MA	USA	1	25

Table 9 Most dominant institutions (in average citation per document)

Rank	*Institution*	*Country*	*Document*	*Citation*	*Average citation per document*
1	Department of Electrical Engineering and Information Technology (DIETI), University of Naples Federico II	Naples, Italy	1	36	36
2	Department of Medical and Surgical Sciences, University Magna Graecia of Catanzaro	Catanzaro, Italy	1	36	36
3	Hospital Antonio Cardarelli	Naples, Italy	1	36	36
4	Responsible for the Programming and Health Planning Unit, Hospital Antonio Cardarelli,	Naples, Italy	1	36	36
5	Scientific Clinical Institutes Maugeri IRCCS	Telese, Italy	1	36	36
6	Center for Quality Improvement, Society of Hospital Medicine, Philadelphia	USA	1	25	25
7	Department of biostatistics, Harvard School of Public Health, Boston, MA	USA	1	25	25

5.7 Most dominant countries

Table 10 shows the most dominant countries with the highly cited articles associated with TQM and performance. Based on the overall number of citations, the USA attests to

being the most dominant country with a citation count of 145, followed by Italy with a count of 39, and Australia with a count of 38.

Table 10 Most dominant countries (in total citations received)

Rank	*Institution*	*Country*	*Citation*
1	USA	44	145
2	Italy	6	39
3	Australia	14	38
4	UK	13	21
5	Canada	6	19
6	Ethiopia	5	18
7	Rwanda	2	12

Table 11 Most dominant countries (in average citation per document)

Rank	*Institution*	*Country*	*Citation*	*Citation*
1	USA	44	145	3.2955
2	Italy	6	39	6.5
3	Australia	14	38	2.7143
4	UK	13	21	1.6154
5	Canada	6	19	3.1667
6	Ethiopia	5	18	3.6
7	Rwanda	2	12	6

However, based on the average citation per document, interestingly, the country of Italy is in the top list, as seen in Table 11, where the publication of highly cited articles belongs to the authors from this country. Other dominant countries are Rwanda, Ethiopia, the USA and Canada, with some average citations per document of 6, 3.6, 3.3 and 3.2, respectively.

5.8 Co-citation analysis

This part analyses the most commonly referenced authors, and periodicals are shown below.

5.8.1 Most frequently cited authors

This analysis describes the findings of author co-citation with referred authors. A total of 825 writers have been discovered based on examining the 137 publications' referenced references. The list was then whittled down to writers who had at least ten citations, yielding five papers. In the co-citation analysis, there are six primary authors identified, as shown in Figure 2. This list of frequently mentioned writers demonstrates the enormous contributions to the literature on TQM and hospital performance.

Figure 2 Network of co-cited authors (see online version for colours)

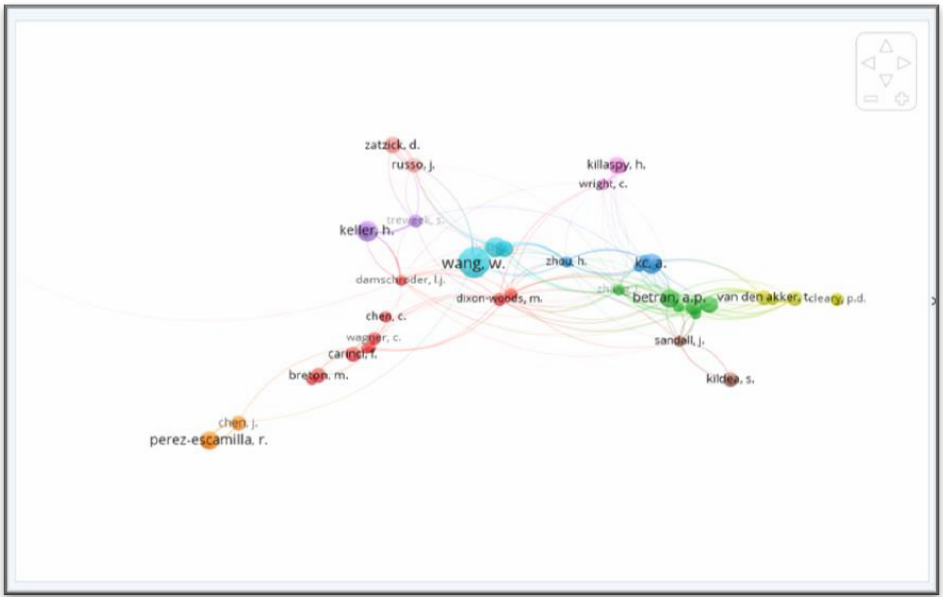
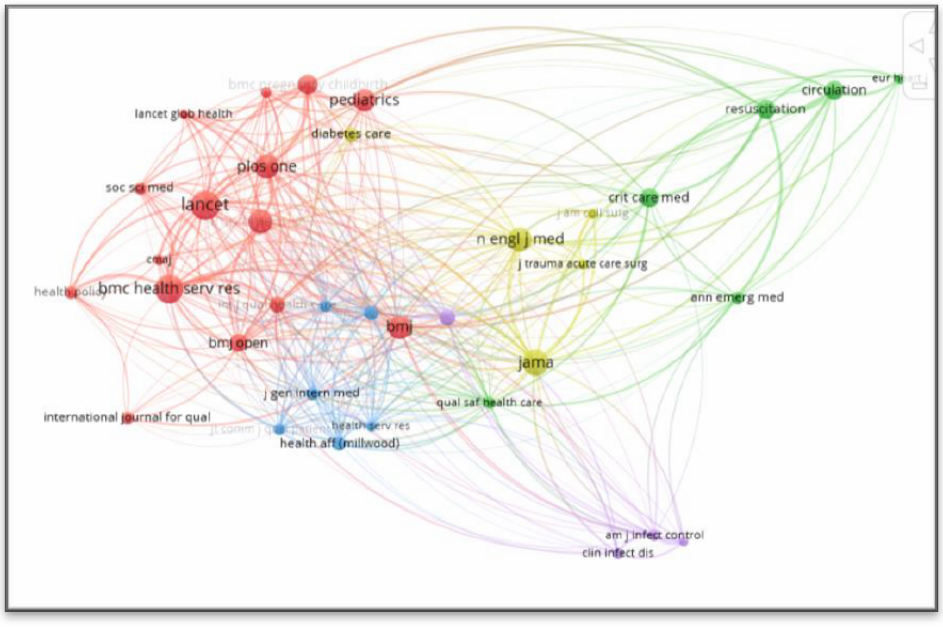


Figure 3 Network of co-cited journals (see online version for colours)

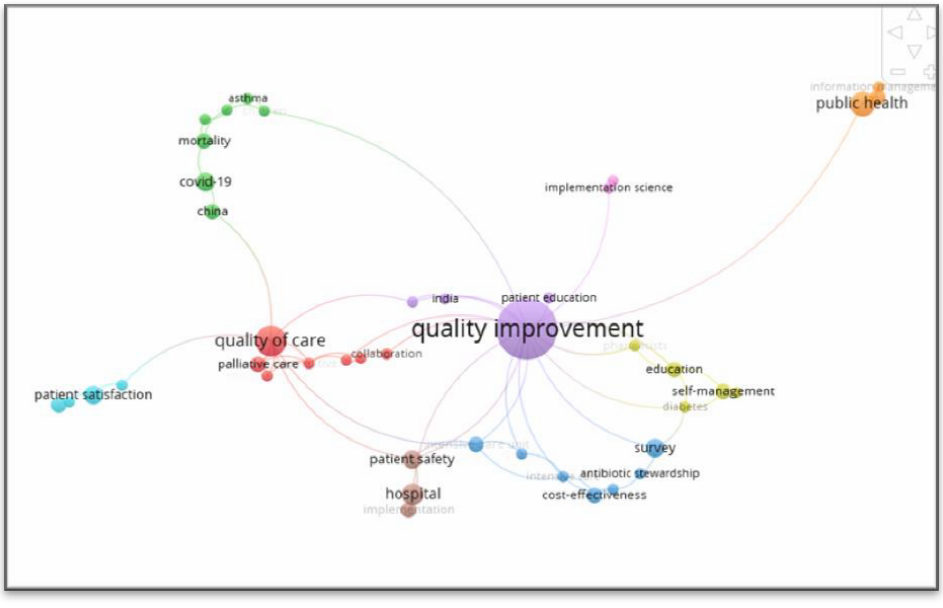


5.8.2 Most frequently cited journals

A co-citation analysis was used to discover the most frequently cited journals. This study examines the results of a co-citation journal with cited publications. *BMC Health*

Services, *BMJ Quality and Safety*, *International Journal of Health Care Quality Assurance* and *International Journal for Equity in Health* are the most frequently referenced journals, as shown in Figure 3. This list of frequently referenced articles demonstrates the importance of these publications for scholars interested in TQM and performance.

Figure 4 Co-occurrence of author keywords (see online version for colours)



5.8.3 Co-occurrence of author keywords

The most often used keywords are described in this study. As depicted in Figure 4, it illustrates the terms of 'quality improvement', 'quality of care', 'patient education', 'patient satisfaction', 'public health', 'hospital', 'patient safety' and 'cost-effectiveness' are considered as the most eminent keywords in the TQM and hospital's performance papers over the past 17 years. Some of the other encouraging keywords to be adopted for future works on TQM and performance include 'self-management', 'implementation science', 'Covid-19' and 'mortality'. These keywords give precious information on the main concepts of TQM and performance literature over the years.

6 Conclusions

This paper aims to explore the subject of TQM and performance by mapping out its development over 17 years with a thorough bibliometric analysis of 137 papers published in journals between 2004 and September 2021.

The analyses in the previous section revealed the number of publications associated with halal tourism that has significantly increased over the years since its conceptualisation. Publications in those years were the highest point in 2014 as well as in

2009. During the 2014–2021 period, there was an increase in the number of publications that were more than twice the initial stage. The year 2020 presents the highest number of publications compared to 2019 and 2015. In terms of the number of cited articles, Improta et al. (2018) is the most cited article with 36 citations. Meanwhile, the papers by Schnipper et al. (2018) and Moheet et al. (2018) received more than 20 citations that discuss TQM and performance.

Additionally, the *BMC Health Service Research* has a higher rank with several published articles of 12, followed by the *International Journal of Health Care Quality Assurance* and *International Journal for Equity in Health* with a number of published articles of 3, respectively. Moreover, seven institutions have the same total number of published articles that discuss TQM and performance; however, four institutions, such as the University of Naples, University Magna Graecia of Catanzaro, Hospital Antonio Cardarelli, Scientific Clinical Institutes Maugeri IRCCS having the same total number of citations received of 36. Finally, based on the overall number of citations received, the USA is the most prominent country, with a total of 145, followed by Italy with 39, and Australia with 38.

The results give a picture of the most dominant contributors that have a great impact on TQM and performance and point out the increasing interest towards the subject of TQM and performance by prominent scholars and institutions globally. A total of 825 writers have been identified from 137 articles based on the findings of a co-citation analysis. The list was then whittled down to writers who had at least ten citations, yielding five papers. The co-citation analysis revealed that there are six key writers. The mentioned writers demonstrate the importance of TQM and hospital performance in the literature.

Meanwhile, the most frequently referenced publications are *BMC Health Services*, *BMJ Quality and Safety*, *International Journal of Health Care Quality Assurance* and *International Journal for Equity in Health*. With regards to the co-occurrence of author keywords, eight keywords were related to TQM and performance. This means the concept of TQM and performance has wider aspects that researchers could explore.

The study has some significant implications. Among others, it gives some important information on the dominant contributors to the subject of TQM and performance, provides information about the most influential research, publications, and institutes that contribute to the TQM and performance subject. The study also reveals the development and progression of the TQM and performance subject over the years as well as disclosing the key research themes that emerge from the literature of TQM and performance, and describes a comprehensive insight on the concept of TQM and performance which can be used as a reference for any strategic initiatives.

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