


A bibliometric analysis of nursing and midwifery research in the Caribbean

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Abstract

Purpose: To determine the research output of Caribbean nurses and midwives.

Methods: We searched the Scopus database to identify publications by Caribbean nurses and midwives during the period 2000–2020. Publications were included in the analysis if they had at least one author who was either a nurse or midwife and affiliated with a Caribbean geographic location. All publication types and languages were included in the analysis. Organization analysis and collaboration networks were created using the VOS Viewer application.

Findings: The number of Scopus publications by Caribbean nurses and midwives progressively grew from 22 in 2000 to 584 in 2020. Cuba recorded the highest number of nursing research publications (319) followed by Jamaica (92), and Puerto Rico (59). Most publishing institutions were universities. The University of the West Indies (Jamaica) ranked highest with 15.2% of publications, followed by Universidad de Ciencias Médicas de La Habana with 14.4% of publications, Universidad de Puerto Rico ranked third with 9.8% of publications. The majority of publications (83.6%) were peer reviewed research articles, while review articles accounted for 9.8% of publications. Six out of the ten journals that published most research done by Caribbean nurse researchers were Cuban journals which published a total of $n = 250$ (75.8%) articles. All six journals had no impact factor and had low cite scores.

Conclusions: Our analysis of bibliometric indicators suggest that recent and steady growth in nursing and midwifery research in the Caribbean has had low visibility. Equipping nurses and midwives with the necessary knowledge and skills to lead, teach, and conduct high quality research through doctorate level education is an imperative for increasing research productivity among Caribbean nurses and midwives.

Clinical relevance: Nursing and midwifery research is critical for evidence-based nursing and midwifery practice. High quality and context specific research evidence will enable Caribbean nurses and midwives to provide quality and culturally sensitive nursing and midwifery care and contribute to evidence informed policy decisions.

KEYWORDS

bibliometric analysis, Caribbean, midwifery research, nursing research, Scopus

INTRODUCTION

Nurses and midwives are the backbone of health care systems accounting for nearly 59% of the health workforce globally and 89% of the health care workforce in low- and middle-income countries (World Health Organization [WHO], 2020). Nurses play a pivotal role in improving healthcare systems efficacy and efficiency (Klopper & Gasanganwa, 2015).

Nursing science is fundamental to evidence-based nursing practices that ensure cost-effective care, better patient outcomes, patient satisfaction and the well-being of healthcare professionals (Feeley, 2017). Developing nursing and midwifery research evidence to facilitate evidence-based nursing and midwifery practice is a key priority of WHO Global Strategic Directions for strengthening nursing and midwifery 2016–2020 (WHO, 2016). Strategic Directions for Nursing in the Region of the Americas by Pan American Health Organization (PAHO) (2019), also emphasize research studies in health-related problems to inform decision making and evaluation of outcomes. Nursing professionals are required to generate new knowledge through research and apply knowledge generated to nursing practice. However, there are wide variations in the generation and utilization of nursing knowledge globally. Developing equitable levels of nursing knowledge generation through research is critical to strengthening nursing science and practice internationally (Uys et al., 2013).

Current evidence suggests low levels of nursing research in low and middle countries compared to high income countries (Fain, 2017). The state of the world nursing report by Klopper and Gasanganwa (2015), suggested low levels of scientific research output in lower and middle-income countries compared to high income countries based on scientific papers published and the number of PhDs produced per year. A scoping review by Sun and Larson (2015), using traditional methods of searching peer reviewed and indexed literature to determine nursing and midwifery research conducted in 54 African countries, suggested low levels of clinical nursing and midwifery research in African countries. Most nurse-led research was being done in South Africa. Low levels of nursing and midwifery research in African countries were attributed to technological challenges, nursing shortages and a shortage of PhD prepared nurse scientists (Klopper & Gasanganwa, 2015).

Many of these challenges exist in Latin America and the Caribbean. A scoping review of peer reviewed published and indexed nursing and midwifery clinical research articles by Iribarren et al. (2018), identified many nurse-led clinical research publications and limited research in midwifery in Latin America and the Caribbean. However, findings revealed an uneven geographical distribution of nurse-led research with the majority of studies (90.6%) done in Brazil. Similarly, in a cross-sectional survey of health

literature authored by nurses in Latin America and the Caribbean by Parmar et al. (2015), the majority of nursing studies were conducted in Brazil while a limited amount of research was carried out in other Latin American countries. In both studies, only a very small proportion (<1%) of nursing studies identified in the Caribbean were done in Jamaica. No published peer reviewed and indexed clinical and midwifery research studies were identified in most Caribbean countries.

This study applied bibliometric analysis methods to determine the research output of Caribbean nurses and midwives. Assessing research productivity of nurses and midwives is critical to identifying gaps and nursing research priorities. Bibliometric analysis is a quantitative method of analyzing written publications (Ellegard & Wallin, 2015). It facilitates the assessment of research capacity of researchers and organizations (Yu & Hayes, 2018). Bibliometric indicators provide information on research patterns of individual researchers, countries and institutions, quantity, and quality of published research (Jia et al., 2014), and identify gaps in research (Wang et al., 2014).

This bibliometric analysis aimed to determine research output levels, research focus, collaboration networks and visibility of nursing and midwifery research in the Caribbean.

METHODS

Information sources and search strategy

The team searched the Scopus database to identify publications by Caribbean nurses and midwives between 2000 and 2020. Prior research suggests that Scopus contains more nursing literature than other databases, such as Web of Science (Powell & Peterson, 2017). Two expert research librarian/data analysts developed a search strategy that included nursing concepts and Caribbean locations. Key terms for nursing concepts included nursing, nurse, nurses, midwife, midwives and midwifery in Dutch, English, French, Portuguese, and Spanish.

The search focused on 34 Caribbean locations: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bonaire, British Virgin Islands, Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Guyana, Honduras, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saba, Saint Barthelemy, Saint Kitts and Nevis, Saint Lucia, Saint Martin, Saint Vincent and the Grenadines, Saint Eustatius, Saint Maarten, Suriname, Trinidad and Tobago, Turks and Caicos Islands and United States Virgin Islands. Search experts ran two search queries on January 8, 2021. The first and more targeted approach searched for nursing concepts and countries within the affiliation fields (Table S1), while the second

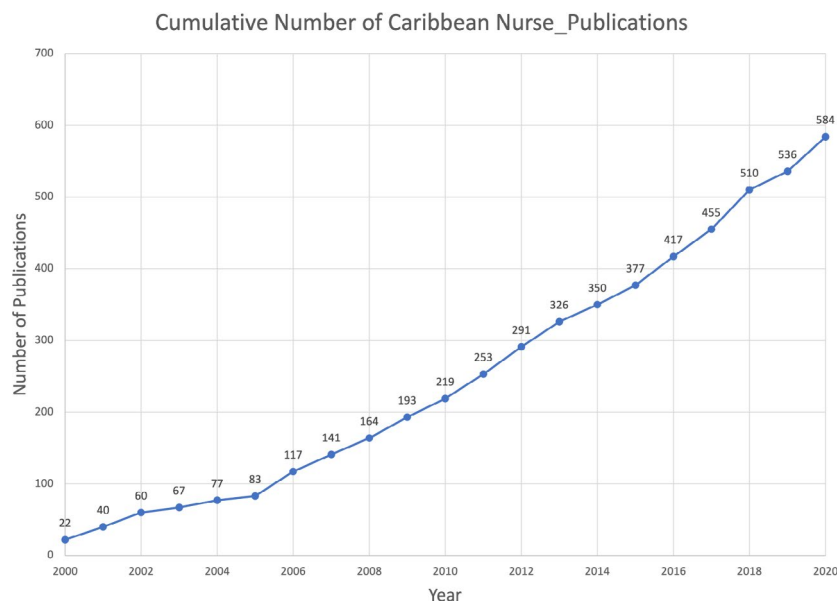


FIGURE 1 Cumulative number of nursing research publications 2000–2020

search focused on nursing concepts within titles and abstracts and countries within affiliation fields (Table S2).

Inclusion and exclusion criteria

Publications were included in the analysis if they were published between 2000 and 2020, had at least one author who was either a nurse or a midwife and affiliated with a Caribbean geographic location. We analyzed all publication types and languages. We retrieved 1768 publications from two queries. After screening all publications using the inclusion criteria, 584 articles were included in the analysis.

Data analysis/visualization

We used the VOSviewer application (van Eck & Waltman, 2016) to construct country/territory and organization co-authorship networks based on data provided in the Scopus affiliation field. We included all countries/territories with one or more publications. A total of 64 countries or territories were represented within the network, with 21 locations representing the Caribbean. Node proximity reflects the relational connectivity of any two geographical locations. Network clusters are based on co-authorship links and are assigned by application algorithms.

We constructed organizational networks based on organization data in the Scopus affiliation field. Prior to organization network generation, data provided within the affiliation field were normalized; entities were consolidated to the highest organizational level (university, hospital, health system, administrative body). We used full counting method to determine the number of publications for each organization. We included all organizations with one or more publications resulting in a total of 62 Caribbean organizations and

108 collaborating institutions worldwide. Each node in the network map represents a research organization, as indicated by Scopus affiliation data. The size of each node represents the number of articles for a given organization.

We constructed topic networks based on terms found in the article title and abstract fields. We normalized terms to address variation in singular/plural forms as well as acronyms/full-term equivalence. We removed commonly occurring terms related to study methods based on input received from group discussions. Once all terms were compiled, a term threshold of 6 or more occurrences was applied to restrict the number of terms included in the visualization. We included the top 700 terms in the visualization, based on a calculated relevance score provided by VOSviewer. We generated visualizations to present term occurrence, interconnection, and recency. We also generated a time overlay visualization using VOS Viewer. Each node represents a term or phrase found in the title or abstract field, while size and proximity reflect term co-occurrence. Color delineates recency of occurrence for a given node, based on average publication date of associated articles; blue-to-grey items indicate an early publication date range, while orange-to-red items denote recent publication.

RESULTS

The level of nursing research and publication output in the Caribbean

The number of Scopus publications by Caribbean nurses and midwives progressively grew from 22 in 2000 to 584 in 2020 (Figure 1). Overall, the number of publications authored by Caribbean nurses and midwives remained low compared to nursing research publications worldwide during the same period (Figure S1). The number of

publications by country is presented in Figure 2. Cuba recorded the highest number of nursing research publications (319) followed by Jamaica (92) and Puerto Rico (59). Countries with the lowest number of publications were Saint Lucia (1), Martinique (1), Dominica (1), Cayman Islands (1), Antigua and Barbuda (1). Fourteen Caribbean countries had no publications in Scopus between 2000 and 2020.

Overall, most publishing institutions were universities (Table 1). The University of the West Indies (Jamaica) ranked highest with 15.2% of publications, followed by Universidad de Ciencias Medicas de La Habana in Cuba with 14.4%. Universidad de Puerto Rico ranked third with 9.8% of publications.

Types of publications

The majority of Scopus publications authored by Caribbean nurses and midwives (83.6%) were peer reviewed research articles, while review articles accounted for 9.8% of publications. Conference papers and book chapters accounted for 1.03% and 0.7% of all publications, respectively. None of the publications by nurse researchers in the Caribbean were in the form of books (Figure S2).

Topic analysis of nursing and midwifery research in the Caribbean'

Terms in abstracts and titles of publications were analyzed to determine the focus of nursing research in the Caribbean (Figure S3). The most common terms were "woman", "student", "nursing", "development", and "process". Terms were organized into ten clusters

using VOS clustering. Cluster 1 presents terms associated with nurse training and process improvement. Clusters 2, 7, and 10 indicate terms associated with patient adherence, health literacy, and health outcomes. Cluster 3 presents terms pertaining to pregnancy and mother/child health indicators. Cluster 4 terms are associated with adolescent health and substance use. Clusters 5, 6, and 9 present terms related to perceptions of nurses and midwives in practice and occupational culture. Cluster 8 terms are associated with women's health risk and domestic violence.

Country and institutional collaboration networks for nurse researchers in the Caribbean

Nurse researchers from Cuba collaborated mainly with researchers from Spain and Latin American countries such as Mexico, Peru, Argentina, Venezuela, Colombia, and Brazil. Other collaborating countries include Belgium, Philippines, Italy, India, Angola, and the United States of America (USA) (Figure S4). Nurse researchers in Jamaica collaborated mainly with researchers in the USA, Canada, Nigeria, and a few other Caribbean countries such as Barbados, Guyana, Bahamas, Puerto Rico, and US Virgin Islands. Nurse researchers in other Caribbean countries such as the Dominican Republic, Barbados, Trinidad and Tobago, Haiti, and Bahamas collaborated mainly with researchers in the USA and Canada. Overall, there was limited collaboration between nurse researchers within Caribbean countries. Researchers in Puerto Rico collaborated mainly with researchers in the USA, Canada, Norway, South Africa, and Barbados. Compared to other Caribbean countries, collaboration networks with Cuban nurse researchers seem to have been

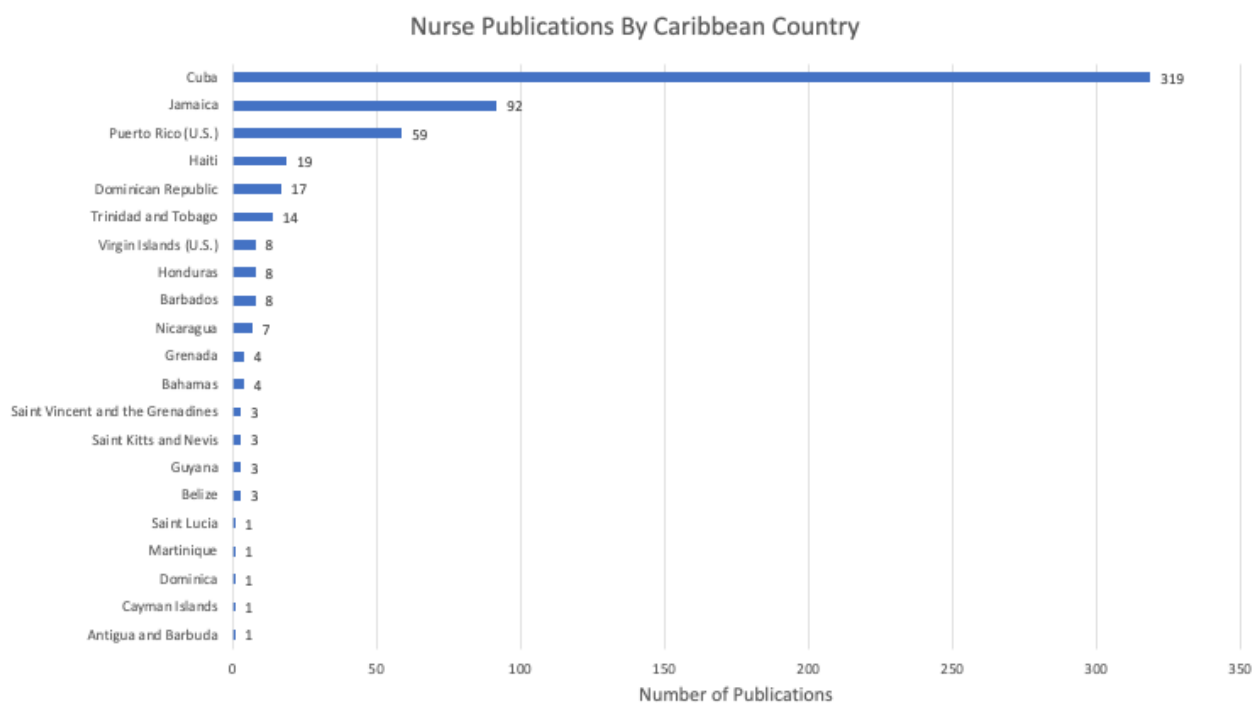


FIGURE 2 Nursing research publications by country 2000–2020

TABLE 1 Caribbean institutions with the most publications 2000–2020

Organization	Country	Publication count	Percentage of publications
The University of the West Indies	Jamaica	89	15.2%
Universidad de Ciencias Médicas de La Habana	Cuba	84	14.4%
Universidad de Puerto Rico	United States	57	9.8%
Sociedad Cubana de Enfermería	Cuba	26	4.5%
University of the Commonwealth Caribbean	Jamaica	13	2.2%
The University of the West Indies, St. Augustine Campus	Trinidad and Tobago	12	2.1%
Hospital Clinico Quirurgico Hermanos Ameijeiras	Cuba	10	1.7%
University of the Virgin Islands	United States	9	1.5%
Universidad de Ciencias Médicas de Cienfuegos	Cuba	6	1%
University of Technology, Kingston	Jamaica	6	1%

established much earlier while collaboration networks in most Caribbean countries seem to be more recent (Figure S4).

In Cuba, research collaborations were mainly among Cuban institutions (Figure S5). On the other hand, nurse researchers from the University of the West Indies collaborated mainly with researchers from University of Ottawa, University of Alberta, and University of Lethbridge in Canada and University of Nigeria. In the USA, nurse researchers from the University of the West Indies collaborated mainly with researchers from John Hopkins University. Nurse researchers from University of Puerto Rico collaborated mainly with researchers from US and Canadian institutions. It is important to note that most international institutional collaborations with University of the West Indies were recent within the past ten years, while collaborative relationships with University of Puerto Rico and some Cuban institution were established earlier.

The visibility of Caribbean nursing research

To determine the visibility of nursing research, we analyzed journals and citation patterns of Scopus publications authored by Caribbean nurse researchers. Characteristics of the top 10 ranking journals publishing Caribbean nursing research include the number of nursing research articles published by each journal, citation score, SCImago journal rank (SJR) and journal impact factor (Table S3). The top 10 high ranked journals published a total of 322 articles. Several journals had the same number of publications therefore, 13 journals made the top 10 ranking. Six out of the ten high ranked journals that published a total of 250 (77.6%) of articles authored by Caribbean nurse researchers were Cuban journals. The top three journals were *Revista Cubana de Enfermería Journal* which published the highest number of articles (150), followed by *Revista Habanera de Ciencias Medicus* (48) and *Revista Cubana de Educacion Medica Superior* (23). *The West Indian Medical Journal* ranked fourth with 20 publications. Ten (10) of the 13 high ranked journals were open access journals but only 7 of the 10 high ranked journals had an impact factor. The *International Nursing Review* had the highest impact factor of 2.034 followed by *AIDS Care Psychological and Socio-Medical Aspects of*

AIDS/HIV with an impact factor of 1.894. However, both journals were among journals which published the lowest number of articles by Caribbean nursing and midwifery researchers.

Citation patterns

Seven (7) out of the ten (70%) most frequently cited publications were authored by nurse researchers from University of Puerto Rico. (Table S4). The review article titled "Sleep and delirium in ICU patients: A review of mechanisms and manifestations" published by an author from University of Puerto Rico was the most frequently cited publication with 144 citations. The article titled "Linear growth increased in young children in an urban slum of Haiti: A randomized controlled trial of a lipid-based nutrient supplement" authored by nurse researchers from Haiti was the second most cited article with 76 citations. Only two (2) publications authored by nurse researchers from the University of the West Indies were among the top ten most cited publications.

DISCUSSION

We conducted a bibliometric analysis to determine the research output of Caribbean nurses and midwives. While findings suggest overall growth in nursing research in the past ten years, the number of publications by Caribbean nurse researchers is still low compared to publications by nurse researchers worldwide. Fourteen (14) of the 34 Caribbean countries analyzed had no nursing research publications recorded in Scopus based on our inclusion criteria. Several factors may account for Caribbean nurses' and midwives' limited research productivity. The lack of graduate level education particularly in low-and middle-income countries is one of the major barriers. A doctoral degree is necessary to facilitate independent research and prepare faculty to teach nursing research (Klopper & Gasanganwa, 2015). According to PAHO (2019), there is a general lack of graduate level programs in Latin America and Caribbean Countries. The only countries with nursing doctoral programs in the Caribbean are Cuba

(1), Jamaica (1) and Puerto Rico (1). These are the three Caribbean countries with the highest number of research publications. Nursing doctoral programs in most Latin America and the Caribbean started in the past fifteen years (PAHO, 2019). For example, the M.S.N and PhD Programs in Jamaica which serve nurses in most non-Latin Caribbean countries started in 2002 and 2013, respectively. This could explain the recent growth in research productivity among Caribbean nurses and midwives. The increase in research productivity could also be due to the establishment of collaborative research networks with international nurse researchers. A collaborative six-year program of research involving a multidisciplinary team of expert researchers and decision makers from Canada and five countries in sub Saharan Africa and the Caribbean facilitated research capacity building among novice nurse researchers through mentoring, role modeling, and enhancing institutional support (Mill et al., 2014). It has been suggested that research collaboration and co-authorship facilitates sharing of knowledge and expertise as well as enhancing productivity and the quality of publications (Franceschet & Constantini, 2010).

Another major challenge impacting Caribbean nursing and midwifery research is the shortage of nurses due to migration to high income countries which contributes to heavy workloads both in clinical and academic settings (Salmon et al., 2007; World Bank, 2009). According to Etowa et al. (2010), most nurses involved in research in Sub-Saharan Africa and the Caribbean were primarily data collectors. Nurses identified the lack of knowledge in research and time constraints due to heavy workloads as key barriers to developing and leading robust programs of research.

While the results indicate recent and steady growth in nursing research in the Caribbean, most publishing institutions are universities. This finding is consistent with a literature review by Parmar et al. (2015), which showed that the majority of articles (67%) authored by nurses in Latin America and the Caribbean were from academic institutions. Dardas et al. (2019), reported similar findings among Arabian nurse researchers. This could be due to the requirement for individuals employed in academic institutions to “publish or perish” since academic institutions evaluate faculty members based on their research productivity (Wilson et al., 2013).

Most publications authored by Caribbean nurses and midwives were peer reviewed journal articles (83.4%), while none of the publications were in the form of books. This finding is similar to findings of an analysis of Arabian nursing research by Dardas et al. (2019) in which 85.4% of publications were journal articles. The authors suggested that the focus on peer reviewed journal articles could be due to the tendency of nurse researchers in the Arab region to focus on understanding health problems rather than developing methods (Dardas et al., 2019). A similar trend was evident in the focus of nursing and midwifery research in the Caribbean. While some of the studies focused on nurse training process improvement and perceptions of nurses and midwives in practice and occupational culture, most of the studies focused on health problems and outcomes.

Another key finding of this analysis relates to the visibility of Caribbean nursing and midwifery research. Six out of the fourteen

high ranked journals which published the majority of research articles authored by Caribbean nursing and midwifery researchers were Cuban journals. While most of those journals are open access, because these journals are published in Spanish, articles published in those journals represent only research done by nursing and midwifery researchers in Latin-Caribbean countries and their networks. Additionally, all six journals do not have an impact factor and have a low cite score ranging from (0.1–0.5) which suggests that articles published in most of those journals are not being cited. Only a small proportion (21.8%) of articles published by Caribbean nursing and midwifery researchers were published in top ranked journals with an impact factor. Taken altogether, this suggests low visibility of nursing and midwifery research done in the Caribbean. Parmar et al. (2015), attributed the lack of visibility of nursing research published by nurse researchers in Spanish speaking countries to the lack of writing skills in English. All top ten most frequently cited research articles published by Caribbean nurses and midwives were in journals published in English.

Strengths and limitations

Scopus is one of the leading databases of journal coverage and scholarly impact. According to Powell and Peterson (2017), nursing publications and scholarly impact is well represented in Scopus. However, it is possible that some publications authored by Caribbean nurse researchers may have been published in journals that are not indexed in Scopus. For example, the Caribbean Journal of Nursing and Midwifery which was established in 2006 and Caribbean Journal of Nursing established in 2013 to facilitate research publications by nurses in the Caribbean are not indexed journals, therefore, articles published in these, and other journals not indexed in Scopus were excluded from the analysis.

Another limitation of this analysis is the use of search terms “nurse” or “midwife” incorporated into the organization name or credentials of authors. Given the fact that some journals do not include author affiliation information, articles published in those journals were excluded from the analysis. Additionally, the lack of graduate programs in nursing in the Caribbean resulted in a limited number of nurses who pursued graduate studies locally enrolling in graduate programs in other disciplines such as psychology, education, or epidemiology. While those nurses are doing research and publishing, the focus of their research might not be specifically on nursing or midwifery. Those publications were excluded from the analysis since they did not meet the inclusion criteria.

CONCLUSIONS

Bibliometric indicators in this analysis suggest low but recent and steady growth in nursing and midwifery research in the Caribbean. However, most of the publications were from Caribbean countries with doctoral level nursing programs. Equipping nurses and midwives

with the necessary knowledge and skills to lead and teach research through doctorate level education is an imperative for increasing research productivity among Caribbean nurses and midwives. High quality and context specific research evidence will enable nurses in the Caribbean to provide quality and culturally sensitive nursing and midwifery care and contribute to evidence informed policy decisions. The limited number of publications by Caribbean nursing and midwifery researchers reflected in this analysis could also be due to the lack of writing skills and financial resources required to publish in indexed journals leading them to disseminate their scholarly works in non-indexed journals, conference proceedings and governmental reports. To gain a complete understanding of research done by nurses in the Caribbean, an analysis of the grey literature is recommended. A clear understanding of nursing research trends and dissemination patterns is necessary to guide targeted interventions to increase research productivity and visibility of nursing and midwifery research in the Caribbean.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

Supplementary Material

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