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Barriers in Access to Care for Patients With Head and Neck Cancer in Resource-Limited Settings

A Systematic Review

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Supplemental content

IMPORTANCE The identification of the barriers to care for patients with head and neck cancer in low-income and lower-middle-income countries is a crucial first step toward the identification of targets for developing and implementing cost-effective programs to increase awareness, prevention, and treatment of head and neck cancer in this setting.

OBJECTIVE To identify the barriers to care for patients presenting with head and neck cancer in low-income and lower-middle-income countries.

EVIDENCE REVIEW Nine databases were searched from their inception to December 21, 2017: Africa-Wide Information, the Cochrane Library, Embase, Global Health, LILACS, MEDLINE, BIOSIS Previews, and Web of Science. Search terms referred to head and neck cancer, barriers to care, and low- and lower-middle-income countries, and no temporal and linguistic restrictions were imposed. Articles were reviewed by 2 independent investigators, and differences in inclusion were resolved by discussion. Bibliographies of all included articles were screened, and all relevant articles were reviewed using the same procedure. Quantitative articles were assessed using the Methodological Index for Non-Randomized Studies tool, and articles with qualitative data used the Critical Appraisal Skills Programme qualitative checklist. This systematic review was registered in PROSPERO (registration No. CRD42018092448) and followed the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols.

FINDINGS Of the 44 articles selected for review, 18 (41%) met the selection criteria. All articles reported quantitative results, and 3 (17%) added some qualitative material to the study design. Most (11 [61%]) of the studies originated from India. A total of 41 different barriers to care were identified, with low level of education (cited in 8 articles [44%]), low socioeconomic status (in 4 articles [22%]), and lack of knowledge about head and neck cancer (in 3 articles [17%]) being statistically associated with a delayed presentation. Misunderstanding of signs and symptoms, use of alternative medicine, and inability to access health care were other barriers discussed in the qualitative articles.

CONCLUSIONS AND RELEVANCE This systematic review highlighted the lack of both qualitative and quantitative information for patients with head and neck cancer in low-income and lower-middle-income countries. The findings suggest that integrating the barriers to care with information from patient lives may identify the clinical and social relevance of these barriers and guide future research.

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Cancer represents a growing threat in low-income and lower-middle-income countries. In 2010, cancer cases in these countries represented more than 50% of newly diagnosed cancer worldwide but accounted for only 5% of total cancer-related expenditures.[1] Head and neck cancer is known to contribute substantially to this burden, with 630 000 new cases identified every year, two-thirds of which are from low-income and lower-middle-income countries.[2,3] In some endemic countries, such as Sri Lanka and India, oral cavity cancer is the most common cancer type in male populations.[4]

Early recognition of the symptoms and prompt referral are key to improving the prognosis after treatment of patients with head and neck cancer.[5] However, the literature shows that patients living in low-income and lower-middle-income countries often present with late-stage diseases requiring complex surgical resections and multimodal treatments.[6-11] In India, 71% to 80% of patients with head and neck cancer present with stage III or IV disease.[6,7] On the African continent, studies show that 83% to 96% of patients present with stage III or IV disease and more than 50% present with distant metastasis.[8-11] However, the current literature lacks articles that describe the factors associated with limiting access to and increasing the delays in receiving care for this specific population.

The aim of this systematic review was to identify the barriers to care for patients presenting with head and neck cancer in low- and lower-middle-income countries. We explored and synthesized both the quantitative and qualitative results found in the literature.

Methods

The protocol of this mixed-methods systematic review was registered in PROSPERO (registration No. CRD42018092448). The mixed-method systematic review of the literature was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines.

Search Strategy

A complete search strategy was developed with the help of a senior librarian on our team (E.G.) from the medical center (McGill University Health Centre, Montreal, Québec, Canada). The search strategy used variations in text words found in the title, abstract or keyword fields, and relevant subject headings to retrieve articles referring to head and neck cancer; barriers to care; and low-income and lower-middle-income countries, as defined by the World Bank.[12] A total of 9 databases were searched from their inception to December 21, 2017, including the Africa-Wide Information (Ebsco), the Cochrane Library (Wiley), Embase (Ovid), Global Health (Ovid), LILACS (Latin American & Caribbean Health Sciences Literature), MEDLINE (PubMed), BIOSIS Previews, and Web of Science.

To be included in the systematic review, studies had to involve patients with head and neck cancer and identify barriers to care and/or motives for late presentation as a primary objective. Studies that only treated thyroid cancer as a head and neck cancer were not eligible for inclusion. We excluded articles dealing solely with pediatric cases. All qualitative and quantitative research articles fitting the above criteria were eligible for inclusion without temporal and linguistic restrictions. All articles from South America were excluded from this review because they were published in upper-middle-income countries, as defined by the World Bank.[12] The bibliographies of all included articles were screened, and all relevant articles were reviewed using the same procedure. EndNote, version 8 (Clarivate Analytics), was used to facilitate the search process.

Key Points

Question What are the barriers to care for patients presenting with head and neck cancer in low-income and lower-middle-income countries?

Findings In this mixed-methods systematic review of 18 studies that originated from Asia and Africa, a low level of literacy was statistically associated with a delayed presentation in 8 articles (44%), and lower socioeconomic status was statistically associated in 4 articles (22%). Qualitative articles identified misunderstanding of symptoms, use of alternative medicine, and inability to access health care as factors associated with a delayed presentation.

Meaning Findings of this study may help identify the clinical and social validity of a given barrier to care in low-income and lower-middle-income countries and may guide future work in this understudied area.

Data Extraction

Two of us (S.A., R.G.) screened all the titles and abstracts from selected articles. Disagreements were resolved by discussion and settled by our principal investigator (D.P.). The full content of preselected articles was then analyzed by 2 of us (P.-L.B., S.A.) for final article inclusion.

The following information was extracted using a predefined data extraction sheet including study location, year of publication, period of data collection, study design, tool used for data collection, patient population, number of patients included in the study, type of data collected (qualitative or quantitative), and barriers to care identified. Data from articles containing qualitative material were treated with a different data extraction sheet that also included the patient's quotes as part of the extraction. Two of us reviewed the collected data (P.-L.B., S.A.) and settled our disagreements with discussion.

Risk-of-Bias (Quality) Assessment

The quality of the articles was assessed with 2 different tools, depending on the type of data collected. For articles presenting solely quantitative data, the Methodological Index for Non-Randomized Studies instrument was used when applicable. For articles presenting qualitative data, the Critical Appraisal Skills Programme qualitative checklist was used. All disagreements regarding both tools were resolved by discussion.

Data Analysis

Identified barriers to care were extracted from articles and classified into 2 general categories: (1) barriers that have been statistically associated with a delayed presentation and (2) barriers that have been identified but not statistically associated with a delayed presentation. Descriptive statistics for each of the barriers were not collected because the patient populations and the definitions of delayed presentation varied greatly between each article. In this context, a meta-analysis was not possible.

The barriers to care identified in qualitative studies were also collected along with associated quotations from the original articles. Inclusion of the original quotations ensured the meanings were not altered during data analysis. The different barriers were then combined

Table 1. Characteristics of the Studies Included in the Systematic Review

No.	Source	Study Location	Period of Data Collection	Study Design	Tool for Data Collection	Patient Population	No. of Participants	Type of Data Collected
1	Agarwal et al,[14] 2011	India	January 2006 to December 2007	Cross-sectional	Survey	Head and neck SCC	153	Quantitative
2	Ahmed et al,[15] 2012	India	January 2009 to June 2010	Cross-sectional	Survey	Head and neck malignant neoplasm	88	Quantitative
3	Akram et al,[16] 2014	India	December 2010 to June 2012	Cross-sectional	Structured questionnaire	SCC oral cavity/oropharynx	259	Quantitative
4	Alahapperuma et al,[17] 2017	Sri Lanka	2017	Cross-sectional	Interviewer-administered questionnaire	Oral and pharyngeal malignant neoplasm	351	Quantitative
5	Baishya et al,[18] 2015	India	June 2014 to November 2014	Cross-sectional	Interviewer-administered questionnaire	Head and neck malignant neoplasm	311	Quantitative
6	Edwards et al,[19] 2016	India	2014	Cross-sectional	Structured questionnaire	Oral cavity malignant neoplasm	400	Quantitative
7	Fasunla and Ogunkeyede,[20] 2013	Nigeria	March 2006 to February 2011	Cross-sectional	Structured questionnaire	Sinonasal malignant neoplasm	61	Quantitative
8	Fles et al,[21] 2017	Indonesia	March 2014 to June 2014	Qualitative research method	Semistructured interview/ questionnaire	Nasopharyngeal carcinoma	12	Qualitative/ Quantitative
9	Joshi et al,[22] 2013	India	2011-2012	Cross-sectional	Structured questionnaire	T3 and T4 oral SCC	201	Quantitative
10	Krishnatreya et al,[23] 2014	India	January 2010 to December 2012	Retrospective	Medical record review	Head and neck malignant neoplasm	3080	Quantitative
11	Kumar et al,[7] 2001	India	NA	Cross-sectional	Structured questionnaire	Oral cavity malignant neoplasm	79	Quantitative
12	Masiiwa et al,[24] 2016	Zimbabwe	April 2014 to March 2015	Cross-sectional	Structured questionnaire	Orofacial tumors	65	Quantitative
13	Onyango and Macharia,[25] 2006	Kenya	January 2014 to December 2014	Cross-sectional	Interviewer-administered questionnaire	Head and neck malignant neoplasm	44	Quantitative
14	Pokharel et al,[26] 2016	Nepal	January 2015-January 2016	Prospective analytical study	Structured questionnaire	Head and neck malignant neoplasm	69	Quantitative
15	Pramitasri et al,[27] 2016	India	August 2013-March 2014	Cross-sectional	Questionnaire	Oral cavity malignant neoplasm	441	Quantitative
16	Rath et al,[28] 2018	India	May 2016-July 2016	Qualitative research method	Semistructured interview/ questionnaire	Head and neck malignant neoplasm	70	Qualitative/ Quantitative
17	Subramanian et al,[29] 2014	India	NA	Qualitative research method	Open-ended questions/ focus group	Oral cavity malignant neoplasm	400	Qualitative/ Quantitative
18	Tariq et al,[30] 2014	Pakistan	2011-2012	Cross-sectional	Questionnaire	Oral cavity malignant neoplasm	190	Quantitative

Abbreviations: NA, not applicable; SCC, squamous cell carcinoma.

to form a meta-aggregation, which generated independent synthesized statements for presentation.[13] Courses of action and conclusions were drawn from those specific statements. Computer-assisted data coding and analysis were performed using NVivo, version 12 Mac (QSR International), to complete the synthesized statements.

Results

Literature Review

A total of 8872 articles were found by the search, of which 6564 (74%) were identified after duplicate removal and screened for the systematic review. Forty-four articles were selected on the basis of their abstracts for a review of their full content. A total of 18 (41%) of the 44 articles met the selection criteria as outlined in the PRISMA flowchart (eFigure in the Supplement).

Eleven of the 18 studies (61%) originated from India. Four studies (22%) came from other Asian countries (Sri Lanka, Indonesia, Nepal, and Pakistan). Three studies (17%) were from African countries (Nigeria, Zimbabwe, and Kenya). Although we included articles without temporal limitation, all of the studies were conducted between January 1, 2001, and December 31, 2018. The patient populations studied were heterogenous, as outlined in **Table 1**.

All articles reported quantitative results, and 3 studies added some qualitative material to their design (Table 1).

Quality Assessment

All studies included in this systematic review were shown to have low quality, with a Methodological Index for Non-Randomized Studies median score of 6.5 out of 16. Most studies lost points owing to the lack of prospective data collection, lack of prospective calculation of the study size, and inappropriate follow-up. Detailed information on these bias assessments is presented in **Table 2**. The studies containing qualitative material were also analyzed using the Critical Appraisal Skills Programme tool. Our evaluation showed these studies had poor research design, lacked transparent recruitment strategies, and lacked consideration of ethical issues. The complete assessment is presented in **Table 3**.

Barriers to Care

A total of 49 different barriers to care were identified from the 18 articles reviewed. Duplicate barriers were merged and grouped into 41 different barriers (eTable 1 in the Supplement).

Table 2. Risk-of-Bias Assessment Using the Methodological Index for Non-Randomized Studies[a]

Source	Clearly Stated Aim	Inclusion of Consecutive Patients	Prospective Data Collection	Appropriate End Points	Unbiased Assessment of End Points	Appropriate Follow-up	Loss of Follow-up <5%	Prospective Calculation of Study Size
1. Agarwal et al,[14] 2011	1	0	2	1	1	0	0	0
2. Ahmed and Sheikh,[15] 2012	2	1	0	1	1	0	0	0
3. Akram et al,[16] 2014	1	1	0	1	2	0	0	1
4. Alahapperuma and Fernando,[17] 2017	2	2	0	2	2	0	0	2
5. Baishya et al,[18] 2015	1	2	0	1	1	0	0	2
6. Edwards et al,[19] 2016	2	1	2	1	1	0	0	0
7. Fasunla et al,[20] 2013	1	0	0	1	1	1	0	0
8. Fles et al,[21] 2017	1	1	1	2	2	0	0	0
9. Joshi and Nair,[22] 2013	1	2	2	1	1	0	0	0
10. Krishnatreya et al,[23] 2014	2	0	0	2	1	0	0	0
11. Kumar et al,[7] 2001	1	2	0	2	2	0	0	2
12. Masiiwa et al,[24] 2016	2	0	0	2	1	0	0	0
13. Onyango and Macharia,[25] 2006	1	2	2	2	1	0	0	0
14. Pokharel et al,[26] 2016	2	0	2	2	1	0	0	0
15. Pramitasri et al,[27] 2016	1	0	0	1	1	0	0	2
16. Rath et al,[28] 2018	1	0	0	2	2	0	0	0
17. Subramanian et al,[29] 2014	1	0	0	1	1	0	0	0
18. Tariq et al,[30] 2014	1	2	0	2	2	0	0	0

[a] See Slim et al[31] for more information on the Methodological Index for Non-Randomized Studies (MINORS) instrument.

Table 3. Critical Appraisal Skills Programme Qualitative Checklist

CASP Item	Fles et al,[21] 2017	Rath et al,[28] 2018	Subramanian et al,[29] 2014
1. Clear statement of the aim	Yes	Yes	Yes
2. Appropriate qualitative method	Yes	Yes	Yes
3. Appropriate research design	No	No	No
4. Appropriate recruitment strategy	No	No	NA
5. Adequate data collection	Yes	Yes	NA
6. Consideration of researcher-participants relationship	No	No	No
7. Consideration of ethical issues	No	No	No
8. Rigorous data collection	Yes	Yes	No
9. Clear statement of finding	Yes	Yes	Yes
10. How valuable is the research	NA	NA	NA

Abbreviations: CASP, Critical Appraisal Skills Programme; NA, not applicable.

A low level of literacy and low socioeconomic status were the barriers to care most commonly associated with a delayed presentation, with level of literacy judged statistically significant in 8 articles (44%) and socioeconomic status considered statistically significant in 4 articles (22%). Insufficient knowledge about head and neck cancer was described as a barrier in 7 articles (39%) but found to be statistically significant in only 3 articles (17%). The health seeking behavior, including toward a wide variety of alternative medicine, was described and studied in 5 articles (28%) and found to be associated with a delayed presentation in 2 articles (11%). Other barriers, such as fate of the patient, cost of treatment, and educational status of caretakers, were also studied (eTable 1 in the Supplement).

Kumar et al[7] created a multiple linear regression analysis model to analyze the primary delay in presentation among patients with oral cancer. The authors found that being escorted by someone, knowing that cancer can develop from the use of tobacco, visiting a physician regularly for the past 12 years, and having available transportation were protective factors (eTable 1 in the Supplement).

Masiiwa et al[24] identified household income, the distance from a health care center, and the number of visits with a primary care physician before referrals as being statistically associated with a delayed presentation in Zimbabwe.[24] All of these barriers were also described in articles from Asia. The lack of confidence in orthodox therapy and the attitude of hospital staff were described only in the African literature as limiting access to care.

Meta-Aggregation of Qualitative Data

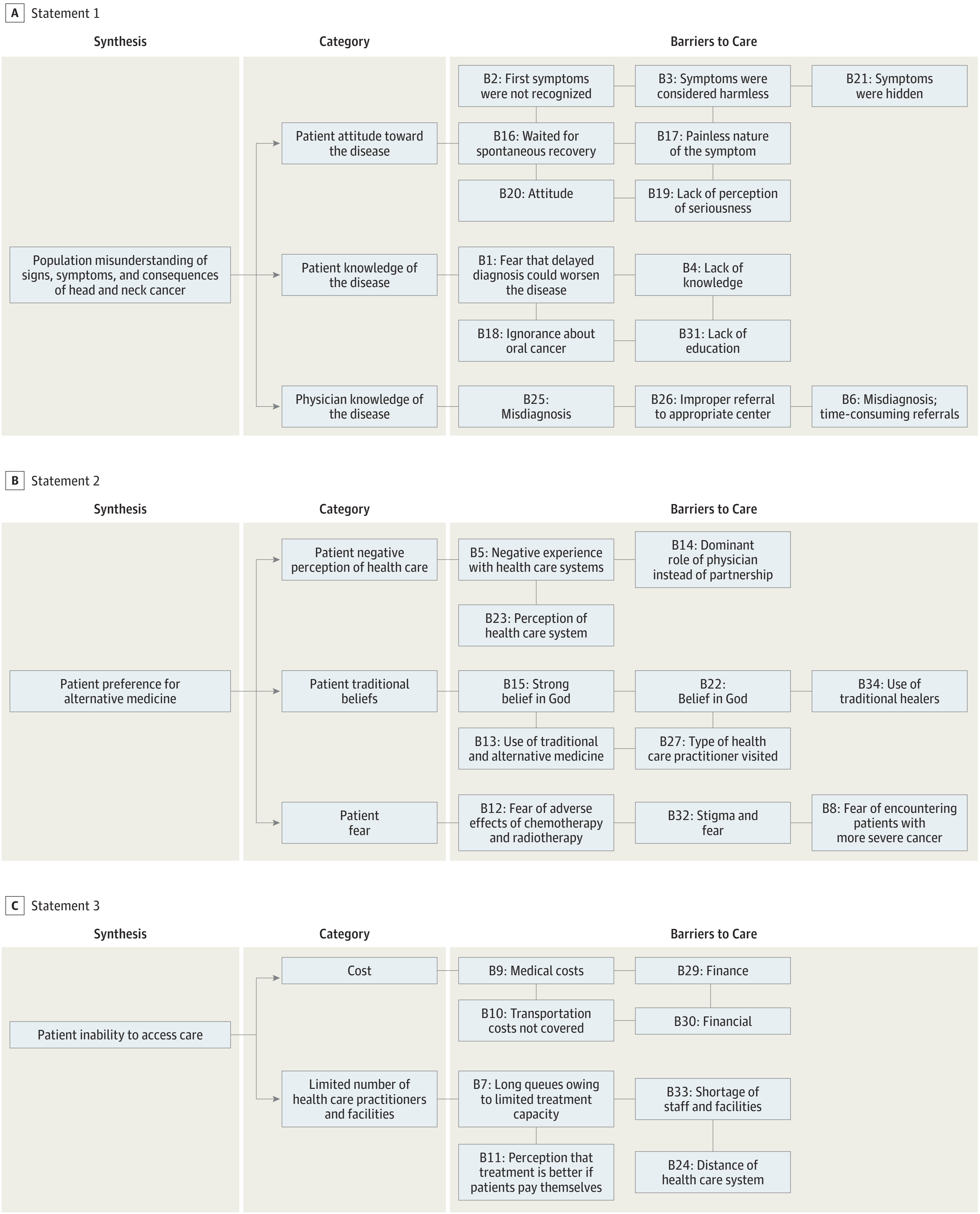
Thirty-four different barriers to care were identified in the 3 articles containing qualitative data; 2 articles were from India, and 1 was from Indonesia. All barriers identified are listed in eTable 2 in the Supplement along with the original quotations from the patients. The 34 barriers were grouped into categories and were then synthesized to create statements. This process continued until all barriers were combined and resulted in 3 synthesized statements that represented all barriers, as depicted in the **Figure**.

Discussion

Treatment of head and neck cancer represents a vast challenge in low- and lower-middle-income countries. Optimal management of the disease requires potential complex surgical treatments, costly technologies, a multidisciplinary team approach, and a long rehabilitation process. Early recognition of the symptoms and prompt treatment are keys to improving patient prognosis and reducing the social and economic burden of the disease.[13] In this context, identifying alterable factors that delay access to care for patients with head and neck cancer in low- and lower-middle-income countries is of utmost importance. This systematic review noted all of the barriers to care reported in the literature for this specific patient population and organized the information to highlight the barriers most clinically and socially valid.

Our first observation was the paucity of the results. Fifteen of the 18 studies were from Asia, with 11 being from India. Thus, the

Figure. Synthesis of Qualitative Data



B indicates barrier.

results presented here are more representative of the Indian patient population than any other on the globe. The sub-Saharan African population is known to have a substantial burden of head and neck cancer but was barely represented, with only 3 articles identified in the literature. Furthermore, all articles with qualitative material came from Indonesia and India.

Three synthesized statements were generated by the meta-aggregation of the qualitative information collected (Figure). Even though the synthesized statements represent qualitative information, they corroborate the many barriers associated with a delayed presentation in the quantitative analysis. We highlighted the level of education, insufficient knowledge of head and neck cancer, use of alternative medicine, cost of traveling, and availability of transportation, which were all statistically associated with a delayed presentation in at least 2 articles and were represented in the 3 synthesized statements from patients (eTable 1 in the Supplement). The ability to support the quantitative results with the patients' experience brought an additional sense of social validity and confirmed that the barriers were the most clinically and socially important. This finding also corroborated the results from a qualitative study by Raykar et al[32] of 148 surgical practitioners from low- and lower-middle-income countries. Even though their study was not limited to head and neck cancer surgical procedures, Raykar et al[32] described the general challenges of performing surgical procedures in low- and lower-middle-income countries. The patients' incapacity to afford the long trips to the closest health care center as well as their cultural beliefs and general mistrust toward health care were highlighted.

The 3 articles from sub-Saharan Africa originated from Nigeria, Zimbabwe, and Kenya. The study from Zimbabwe was the sole article from Africa to have identified barriers that were statistically associated with a delayed presentation. Those barriers were household income, distance from a health care center, and the number of visits with a primary care physician before referrals. These barriers were also described in articles from India. The lack of confidence in orthodox therapy and the attitude of hospital staff were described in the article from Nigeria as limiting access to care, but these 2 factors were not described in the literature from India and might play a bigger role in sub-Saharan Africa than in Asia. The absence of qualitative material contributed to the paucity of the results in the African literature. Without patients' input, the data were restricted to the institutional understanding of access to care, thus limiting the clinical and social validity of the information. Further research in the field is needed to describe the situation on the African continent.

Local and global initiatives are discussed in the literature to address these different challenges. From the local point of view, health care practitioners from low-income and lower-middle-income countries have described their involvement in medical education in institutions or with the community through seminars in villages or meetings with traditional healers to educate the population about the signs and symptoms of surgical emergencies.[32] Although this involvement has been described mostly in the global literature for surgical emergencies, such practices have also been documented in the otolaryngology community. For example, according to a team of global leaders in head and neck surgical procedures, a sustainable approach to improving the delivery of care to patients with head and neck cancer is the establishment of fellowship programs that train surgeons in accordance to local challenges.[33] Such a program is offered at the University of Cape Town and has had successful results, given that the fellows are now practicing in teaching hospitals across Africa.[34] Fagan et al[34] have also described how international collaborations can be organized to provide short educational workshops that support the local surgical community.

From the global point of view, in 2015, the Lancet Commission on Global Surgery published a series of recommendations with the intent of creating a framework for research in global surgical procedures.[35] Among those recommendations, 1 was highlighted: the necessity for the surgical community to better understand the factors associated with limiting access to surgical care for specific pathological conditions. Moreover, the first step of the National Cancer Control Programme developed by the World Health Organization was to describe the current situation for cancer patients in low-income and lower-middle-income countries.[36] The identification of the barriers to care for patients with head and neck cancer was in line with the objectives of both the National Cancer Control Programme and the Lancet Commission on Global Surgery and was a first step toward the creation of a cancer control plan that is integrated with the sociocultural aspects of patients' lives and provides cues for the development of cost-effective programs.

Limitations

The main limitation of this systematic review was the attempt to synthesize the information coming from studies with a low level of evidence. Quality or risk-of-bias assessment showed overall poor quality for both the quantitative and qualitative articles. In this context, a meta-analysis was impossible owing to the heterogeneity of the populations studied and the outcomes measured. Some articles included all patients with head and neck cancer, whereas others studied specific populations such as patients suffering from sinonasal or nasopharyngeal malignant neoplasms. Furthermore, although the primary objective of most studies was to identify statistical associations between a specific barrier and a delayed presentation, the definitions used differed greatly between the studies. The articles commonly defined a delayed presentation as being either the time between first symptoms and presentation at 3 or more months or the size of the tumor being T3 or T4. The optimal definition of delayed presentation is still debated in the literature, and some authors have argued that most definitions are not clinically relevant and that a continuous variable may be more appropriate.[5] This point of view was not applied in any of the articles included in this systematic review.

Conclusions

To our knowledge, this mixed-methods systematic review is the first to focus on the barriers to care for patients presenting with head and neck cancer in low-income and lower-middle-income countries. The study was conducted to integrate the barriers associated with a delayed presentation with information from patients' lives. We believe this integration helps identify the clinical and social validity of a given barrier and may guide future work in this understudied area. Furthermore, this study highlighted the paucity of data and the lack of both qualitative and quantitative information for patients with head and neck cancer living in low-income and lower-middle-income countries.

ARTICLE INFORMATION

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