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Authors

MacKechnie, Madeline C
Miclau, Theodore A
Cordero, Daniella M
[et al.](#)

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1 **Abstract**

2 **Background:** Leadership development programs are integral to the future success of public
3 health and healthcare organizations. Despite low-and middle-income countries (LMICs) bearing
4 a greater burden of unmet medical needs, fewer professional development opportunities exist in
5 these settings. This study aims to provide a comprehensive understanding of available leadership
6 development programs for healthcare professionals in LMICs.

7 **Methods:** This study conforms to the PRISMA-P systematic review and traditional meta-
8 analyses guidelines. Articles were identified through five academic databases: Embase, PubMed,
9 Web of Science, ERIC, and Business Source Complete. Eligibility criteria included original
10 research published in peer-reviewed journals on non-clinical, leadership development programs
11 offered to healthcare professionals in LMICs worldwide.

12 **Results:** 41 peer-reviewed articles met inclusion criteria, of which physicians, nurses, and public
13 health professionals were the most common types of providers to attend leadership development
14 programs; no programs exclusively targeted surgeons. The greatest proportion of programs were
15 short-term interventions (ranging from 1 day to 12 weeks). Communication, organizational
16 structure and leadership, and personal development were identified as the three most common
17 leadership topics in the review. Regionally, leadership programs were reported most commonly
18 in Africa, specifically in Anglophone countries. Other regions worldwide, including Latin
19 America and the Caribbean, were underrepresented in the review.

20 **Conclusions:** The findings from this review identify gaps in leadership development programs
21 for certain groups of healthcare professionals from certain geographical regions, supporting the
22 need for further provision of and participation in these opportunities in LMICs.

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26 **Keywords:** leadership development, leadership training, healthcare professionals, low-and
27 middle-income countries, LMICs

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29

30 **Highlights (80 characters including spaces)**

31

32 1. Despite LMICs bearing a greater burden of unmet medical needs, fewer professional
33 development opportunities exist in these settings.

34

35 2. Physicians were the most common group to attend leadership programs. No programs
36 exclusively targeted surgeons.

37

38 3. Communication, organizational structure and leadership, and personal development were
39 the three most commonly identified topics in the review.

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41 4. Regionally, leadership programs were reported most commonly in Africa, specifically in
42 Anglophone countries.

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49 **1. Introduction**

50 Developing and facilitating leadership training programs for healthcare professionals is critical to
51 improving the delivery of high-quality healthcare.^{1,2} Effective leadership, communication,
52 collaboration, and strategic planning are increasingly vital to the future success of public health
53 and healthcare organizations.³⁻⁵ In the medical field, the concept of leadership has evolved from
54 a top-down, hierarchical model where advancement was based on academic or clinical
55 accomplishments, to a model where more emphasis is put on leadership as a multifaceted, non-
56 linear process.^{2,6,7} The ability to mentor, motivate, and collaborate on developing a common
57 vision are valued skills for effective leaders.^{6,8} These non-clinical behavioral characteristics are
58 paramount for success in the medical field and are foundational to healthcare professionals'
59 skillsets and clinical expertise.⁹⁻¹¹

60
61 There is a growing interest in teaching and supporting non-technical leadership training for
62 medical professionals, and over the last two decades, participation in leadership programs has
63 increasingly become recognized as a scholarly activity.⁶ While literature in the field of medical
64 education leadership has increased substantially, the majority of research on the efficacy of
65 leadership education for healthcare professionals is concentrated on high-income countries
66 (HICs);⁴ limited literature exists on the availability of such programs in low-and middle-income
67 countries (LMICs). With only 2% of health expenditures worldwide being spent on training
68 healthcare professionals,¹ the Lancet Commission has endorsed competency-based leadership
69 education and training for healthcare professionals to address and improve the delivery of patient
70 care.¹² Yet, there remains an overall lack of information on leadership development programs for
71 healthcare professionals in low-resource environments, highlighting an important field for
72 examination. Thus, the aim of this systematic review is to provide a comprehensive
73 understanding of the available leadership development programs for healthcare professionals in
74 LMICs.

75 76 **2. Materials and Methods**

77 *2.1. Search Strategy*

78 This systematic literature review conforms to the systematic review and traditional meta-analysis
79 guidelines outlined in the 2015 PRISMA-P (Preferred Reporting Items for Systematic Reviews

80 and Meta-Analysis) Statement.¹³ The objective was to identify original research articles that
81 described programs and courses on leadership skills that were offered to healthcare professionals
82 and trainees. Literature inclusion criteria to identify eligible articles were established a priori to
83 include the following: a full-text, peer-reviewed publication, and a primary source of original
84 data with no excluded articles based on language; description of a program or course curriculum
85 with a primary focus on developing leadership development skills; and description of a course in
86 which at least 50% of the participants are healthcare professionals from countries that are
87 classified as low-income countries (LICs), lower-middle-income countries (LMICs), and upper-
88 middle-income countries (UMICs) according to the 2020 World Bank Country and Lending
89 Groups data.¹⁴ All HICs were excluded from the search, with the exception of two Latin
90 American countries: Chile and Uruguay. The latter countries were included to better understand
91 the opportunities in the Latin American region, which have high levels of healthcare inequities
92 across countries and similar limitations in their public health systems.

93

94 *2.2. Data Sources*

95 A comprehensive search was conducted from 1985 to March 2020 in five academic databases:
96 EMBASE (<https://www.elsevier.com/solutions>); PubMed (<https://pubmed.ncbi.nlm.nih.gov>);
97 Web of Science (<https://clarivate.libguides.com/webofscienceplatform>); Education Resources
98 Information Center (ERIC; <https://eric.ed.gov/>); and Business Source Complete
99 (<https://www.ebsco.com/products/research-databases/business-source-complete>). With the aid of
100 a research librarian, a standardized search algorithm was developed using search terms in
101 English and modified for each database. Both index terms (Mesh and Emtree) and keywords
102 were used when formulating the searches. The searches were divided into three main concepts: 1.
103 leadership training and education, 2. physician and clinician groups, and 3. low-and middle-
104 income countries. The search strings included numerous synonyms and related terms within
105 these three concepts to develop the final search for each database (Appendix A).

106

107 *2.3. Study Selection*

108 A systematic review software program, DistillerSR (Evidence Partners, Ottawa, Canada),
109 was used to facilitate article selection and data extraction. Following duplicate detection in both
110 EndNote and DistillerSR, two rounds of screening were conducted to identify eligible articles: a

111 title and abstract screening, followed by full-text screening. Three researchers (M.C.M., T.A.M.,
112 and D.M.C.) independently evaluated the titles and abstracts of articles, which were reviewed in
113 duplicate to identify possible eligibility (Appendix B). Remaining articles from this group
114 underwent a full-text screening, which were also reviewed in duplicate to determine eligibility
115 for inclusion (Appendix C). Any inclusion conflicts during the title and abstract screening phase
116 and the full-text screening phase were subsequently resolved by consensus amongst all authors.
117 Any publications that were not peer-reviewed publications and did not appropriately detail the
118 content of a course curriculum were excluded. No publications were excluded based on
119 language, with articles in English and Spanish included in the final review.

120

121 *2.4. Data Extraction and Synthesis*

122 Two researchers (M.C.M. and T.A.M.) independently conducted data extraction in eligible
123 articles using a structured data entry form (Appendix D). Extracted information from the data
124 entry form included: 1. course participants: age, healthcare profession, country of origin, medical
125 or surgical specialty, and participant selection process; 2. course setting and design: host country,
126 host organization, type of course, length of course, number of participants, teaching and learning
127 methods employed, and educational content; and 3. evaluation design, method, and outcome:
128 quantitative and qualitative methods and course impact.

129

130 **3. Results**

131 *3.1 Literature Search Yield*

132 The literature search yielded 4,283 citations: 460 from PubMed, 2,680 from EMBASE, 566 from
133 Web of Science, 453 from ERIC, and 124 from Business Source Complete. After duplicate
134 detection, there were 2,823 unique articles that met the eligibility criteria. After title and abstract
135 screening, 146 articles were included for full-text screening, 41 of which were selected for final
136 data extraction (Figure 1). Table 1 presents an overview of the articles reviewed.¹⁵⁻⁵⁵

137

138 *3.2 Setting and Target Group*

139 Among the 41 included articles, leadership development programs were conducted in 44 distinct
140 countries across six continents, 7 of which were LICs, 12 were LMICs, and 10 were UMICs.
141 Fifteen of these programs were hosted in partnerships with HICs. Regionally, the highest

142 proportion of leadership programs in the review (n=20) were held in Africa and represented
143 participants from African countries most frequently (n=23). By contrast, only 6 programs were
144 held in Latin American and the Caribbean, identifying this region as the most underrepresented
145 in the review.

146

147 A wide range of health providers participated in the leadership development programs, including
148 attending physicians, fellows, residents, medical students, nurses, healthcare students, and public
149 health professionals. Of the 41 articles, 20 programs targeted physicians as course participants,
150 with another third (n=13) targeting nurses, followed by public health professionals (n=8), and
151 medical students (n=4). Four of these leadership programs were interdisciplinary and included
152 physicians, nurses, and healthcare staff.^{31,33,41,44} Of the 20 programs that targeted physicians,
153 nine were specific to certain specialties, including psychiatry, internal medicine, emergency
154 medicine, palliative care, and infectious disease. Notably, no programs included in this study
155 exclusively targeted surgeons.

156

157 While more than half (n=23) of the programs did not specify participant ages, those that did,
158 indicated that leadership programs were commonly geared towards individuals 30 years and
159 older (n=16).

160

161 *3.3 Program Design*

162 Academic institutions most commonly hosted leadership development programs (n=25).

163 Approximately half of the programs (n=18) were short-term interventions, ranging from one day
164 to 12 weeks, and comprised plenary sessions, workshops, and conferences. Fewer programs
165 (n=10) were delivered at a mid-term length, ranging from six months to one year. Long-term,
166 programs, ranging from one to five years, were the least common in this review (n=7). Both the
167 mid- and long-term courses included experiential learning elements, such as participating in
168 international mentored projects and experiences that supplemented didactic work. Six articles did
169 not specify the program duration.

170

171 *3.4 Curricula and Learning Methods*

172 The educational leadership course curricula were multidisciplinary and included diverse content
173 on leadership development and management themes. The three most common topics across
174 leadership programs were communication (n=21), organizational structure and leadership
175 (n=18), and personal development (n=15). Similarly, multiple learning methods were reported,
176 with the most common being workshops (n=24) and lectures (n=20), followed by problem-based
177 learning activities (n=11), groupwork (n=10), and experiential learning and fieldwork (n=10).
178 Case-based discussions (n=4), didactics (n=4), coaching sessions (n=4), and seminars (n=3) were
179 employed less frequently. Journaling and note-taking were the least reported (n=2) learning
180 methods in the review.

181
182 Qualitative, quantitative, and mixed methods were used to assess course impact, including
183 validated assessment tools, such as the WK Kellogg logic model of program evaluation,
184 Kirkpatrick four-level training evaluation of impact model, and the Birkman Method assessment.
185 Quantitative methods such as the Likert scale (n=14) and pre-and post-intervention measures
186 including self-reported questionnaires and surveys (n=22) were employed. Qualitative data from
187 in-depth unstructured, semi-structured, and structured interviews (n=8) and feedback methods
188 (n=8) enriched the evaluations, with only a minority of programs applying focus groups, note-
189 taking, and participant observations.

190 191 *3.5 Outcomes and Impact*

192 Personal leadership skills (n=27) and organizational impact (n=14) were reported across
193 leadership development programs. Personal impact was measured by self-reported improvements
194 in behavior or application of course knowledge, long-term practice changes, or accomplishments.
195 Improved awareness of personal behavior when in a leadership or managerial position and
196 greater opportunities for peer-reviewed publications and presentations, were cited in the articles.
197 In addition, organizational impact was determined by the implementation of policy changes or
198 improved workplace culture and delivery of services. The establishment of formal governance
199 boards, coalitions, and non-governmental organizations were reported in the review.

200 201 **4. Discussion**

202 A systematic review of the literature was conducted, describing available leadership
203 development programs for healthcare professionals in LMICs worldwide. While these programs
204 appear to be evenly distributed across income groups (LICs, LMICs, and UMICs), the literature
205 on leadership training in resource-limited settings remains scarce. Despite the fact that LMICs
206 bear a greater burden of unmet medical needs relative to resource-rich countries,^{9,28,56} there are
207 fewer professional development opportunities in these countries for frontline healthcare
208 providers that could benefit patient care;⁵⁷ building leadership capacity and equipping healthcare
209 professionals with leadership skills could help to transform and improve patient outcomes and
210 health systems.³

211
212 While resource-limited countries are seen in regions throughout the world, there appeared to be
213 more international sponsorship (governmental, institutional, or foundation support) for
214 leadership programs based in Africa, particularly in countries with higher percentages of English
215 speakers (Botswana, Uganda, Kenya, and Tanzania). Other regions worldwide, many of which
216 are comprised by non-English speaking countries, were underrepresented in the review. Indeed,
217 programs in Latin America were only represented in six of the 41 articles, of which only one was
218 written in Spanish. In addition to there being few leadership programs identified in this
219 geographic region, only two Latin American leadership programs had international sponsors or
220 partnerships. While language barriers may be one reason for the paucity of programs in this
221 region, the lack of political support and chronic under-funding may also contribute as
222 obstacles.⁵² Moreover, misrepresentation of the economic status of many Latin American
223 countries may be a reason for lack of international sponsors or partnerships; though many of
224 these countries are classified as UMICs, the large disparity in the distribution of wealth and
225 diversity of resources causes a majority of these populations to face challenges typically found in
226 countries with a lower gross domestic product (GDP).^{28,45,58} Consistent with many LMICs,
227 healthcare challenges such as lack of access to resources and affordable care, shortages of skilled
228 healthcare professionals, and overburdened health systems remain an issue in many regions of
229 these countries.^{59,60}

230
231 Though physicians were the most common group of healthcare professionals to attend leadership
232 programs, this only pertained to physicians practicing in a medical, non-surgical specialty. No

233 programs exclusively targeted surgeons, highlighting a lack of leadership opportunities for
234 surgeons in LMICs. Recent literature shows that the majority of leadership programs designed
235 for surgeons are predominantly based in HICs and may tend to concentrate on clinical skills
236 rather than non-technical skills.^{57,61–63} Along with physicians, public health professionals also
237 attended leadership programs more frequently than other healthcare professions. One explanation
238 for this may be that because health systems often have both provider and system-level
239 challenges, training these public health professionals may be viewed as more effective in making
240 system-based changes, by changing policies and increasing awareness at the national level.^{64,65} A
241 partnership with healthcare professionals from all sectors can be an effective way forward.^{66,67}

242

243 Since team building and interdisciplinary collaboration are some of the greatest challenges in
244 healthcare, an integrated leadership curriculum that facilitates the coordination of diverse ideas
245 and needs, while creating a shared vision, may be the solution to unifying a team.^{18,68} Frich et al.
246 reported on a lack of integrated leadership programs between physicians and non-physicians in
247 their 2013 review on leadership development programs for physicians.⁴ Research has moved
248 forward from that time, and this study identified four integrated programs between physicians
249 and non-physicians, from articles published between 2015 and 2017. Although it is only a
250 minority of articles, the presence of such programs suggests an increasing appreciation of the
251 value of interprofessional networking in leadership training. In addition, the findings from this
252 review showed that the majority of leadership development programs targeted participants of
253 ages 30 years and older. Consistent with recent literature, there is an increased understanding of
254 the value of cultivating leadership at a younger age to provide a foundation for further
255 development.^{2,11,69}

256

257 The review has several potential limitations. First, the substantial heterogeneity among the study
258 designs, the wide scope of participants, and the assortment of metrics used to identify impact
259 precluded quantitative synthesis or meta-analysis of the data. Though these various factors may
260 have limited the ability to draw more generalizable conclusions, this investigation provided the
261 basis for a better understanding of the current state of global leadership programs in LMICs.
262 Second, there is a possibility that limiting the search strategy to peer-reviewed literature may
263 have introduced selection bias. Although selection bias was minimized in the study by

264 conducting a comprehensive search in five large academic databases and not excluding articles
265 based on language, it is expected that not all leadership programs are taught as formal, structured
266 courses, or are published in the literature. Therefore, this review likely underrepresents the subset
267 of programs available. However, because the work was based on searchable publications in peer-
268 reviewed journals, the stringency of the review process better ensures reliable data. Indeed, other
269 databases, such as the Scientific Electronic Library Online (Scielo), which often cite Spanish and
270 Portuguese publications, could reveal additional relevant articles.

271
272 In summary, a commitment to developing healthcare professionals' leadership capacity is critical
273 for future success in the medical field. Leadership development programs for healthcare
274 professionals can promote interprofessional networking, develop personal and professional
275 skills, and ultimately improve the delivery of high-quality healthcare. The findings from this
276 review identify gaps in leadership programs for certain groups of healthcare professionals from
277 certain geographical regions, supporting the need for further provision of and participation in
278 these opportunities in LMICs.

279

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491 **Figure Legend**

492 Figure 1. PRISMA Flow Diagram

493 Table 1. Overview of the 41 included articles