

# Subgroup analysis of Brazilian participants of a medical leadership competencies instrument: a cross-sectional survey study of the Latin American Cooperative Oncology Group (LACOG) and the Academy of Leadership Sciences Switzerland (ALSS)

Análise de subgrupo de participantes brasileiros de um instrumento de competências de liderança médica: um estudo de pesquisa transversal do Latin American Cooperative Oncology Group (LACOG) e da Academy of Leadership Sciences Switzerland (ALSS)

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## ABSTRACT

**Introduction:** We previously published the results of a medical leadership (ML) competencies instrument applied to Latin-American (LA) physicians with a leadership position, which disclosed meaningful differences in the valuation of specific ML competencies by LA physicians as compared to a similar survey applied to healthcare professionals from North America and Europe (NA/EU). Because the most pronounced differences in the responses were in terms of country of medical practice, we felt that an analysis focused on the Brazilian participants (a culturally more homogeneous population) could provide further insights into understanding other subgroup differences. **Objectives:** We aimed to: 1) compare the responses from the Brazilian participants with those of the NA/EU survey and 2) perform subgroup analyses within the Brazilian participants. Design and Setting: Cross-sectional survey study applied only once. **Material and Methods:** Between November 13<sup>th</sup> and December 12<sup>th</sup>, 2018, we collected 217 responses. Results: There were (n=135/63%) Brazilian participants. The valuation of a set of ML competencies by Brazilian physician-leaders roughly match those of the main study (task management remaining the most valued set of competencies versus 3<sup>rd</sup> in the NA/EU survey). However, significant differences in the responses were seen in some subgroups, especially in terms of the impact of seniority (which no longer appears to affect the responses) and gender (with women no longer placing a higher value on innovation competencies). **Conclusion:** This analysis reinforces the existence of significant cultural differences within the LA participants, and that these cultural variations can significantly affect the valuation of specific ML competencies.

**Keywords:** Competency-based education; Leadership and governance capacity; Health facility administration.

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**Financial support:** none to declare.


**Conflicts of interest:** The authors declare no conflict of interest relevant to this manuscript.

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**Received on:** October 1, 2022 | **Accepted on:** October 28, 2022 | **Published on:** December 1, 2022

**DOI:** <https://doi.org/10.5935/2526-8732.20220375>

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## RESUMO

**Introdução:** Publicamos anteriormente os resultados de um instrumento de competências de liderança médica (LM) aplicado a médicos latino-americanos (LA) com posição de liderança, que revelou diferenças significativas na avaliação de competências específicas em LM por médicos LA em comparação com uma pesquisa semelhante aplicado a profissionais de saúde da América do Norte e Europa (AN/UE). Como as diferenças mais pronunciadas nas respostas foram em termos de país de prática médica, sentimos que uma análise focada nos participantes brasileiros (uma população culturalmente mais homogênea) poderia fornecer mais informações sobre a compreensão das diferenças de outros subgrupos. **Objetivos:** Nossos objetivos foram: 1) comparar as respostas dos participantes brasileiros com as da pesquisa AN/UE e 2) realizar análises de subgrupos entre os participantes brasileiros. **Desenho e Contexto:** Estudo de levantamento transversal aplicado apenas uma vez. **Material e Métodos:** Entre 13 de novembro e 12 de dezembro de 2018, coletamos 217 respostas. **Resultados:** Houve (n=135/63%) participantes brasileiros. A avaliação de um conjunto de competências de LM pelos líderes médicos brasileiros corresponde aproximadamente às do estudo principal (o gerenciamento de tarefas continua sendo o conjunto de competências mais valorizado versus o 3º na pesquisa AN/UE). No entanto, diferenças significativas nas respostas foram observadas em alguns subgrupos, especialmente em termos de impacto da senioridade (que já não parece afetar as respostas) e gênero (com as mulheres não mais valorizando as competências de inovação). **Conclusão:** Esta análise reforça a existência de diferenças culturais significativas entre os participantes da LA e que essas variações culturais podem afetar significativamente a valorização de competências específicas da LM.

**Descritores:** Educação baseada em competências; Capacidade de liderança e governança; Administração de unidades de saúde.

## INTRODUCTION

Over the centuries, leadership failure has been plaguing humanity's progress across many areas, ranging from politics and geopolitics to business.<sup>1,2</sup> In the healthcare sector – one that has faced growing challenges because of rising costs, competition and high rates of team burnout<sup>3,4</sup> – investing in leadership training has been a recent trend.<sup>5,6</sup> In the past, physicians rose to leadership positions because of seniority and hierarchy, instead of training in the required skills; this phenomenon is still frequent in many institutions and may have tragic consequences to the corporation and the physician himself – as he is faced with the seemingly unavoidable reality of declining success after a brilliant career as a clinician, researcher or educator.<sup>7,8</sup>

The basic concepts of leadership, including modern theories of leadership, required skills and key leadership roles within the context of healthcare education have been recently addressed by Van Diggele et al. (2020).<sup>9</sup> In a meta-analysis of trait and behavioural theories of leadership, Derue et al. (2011)<sup>10</sup> concluded that much of the research evidence fails to provide an integrated framework for understanding what constitutes leadership effectiveness. The authors did though empirically identify some leader traits and behaviours that represent effective leadership.

Other leadership researchers aimed to distinguish between leadership, administration and management, and concluded that leadership is synonymous with 'change', while management and administration are more in line with 'maintenance'. Of note, all three dimensions were identified as critical functions of organisational activity in a study reported by Çitaku et al. (2012).<sup>11</sup> In a Japanese survey addressing leadership competencies in community medicine, six set of competencies have emerged as critically important, namely 1) 'Medical ability' – which means being able to deal with a wide range of different problems; 2) 'Long-term perspective' – which is the ability to develop a long-term, comprehensive vision and to continuously work to achieve it; 3) 'Team building' – which is the ability to drive forward programs that include residents and local government workers, to elucidate a vision, to communicate properly and to accept other medical professionals; 4) 'Ability to negotiate' – which ensures the smooth progress of the programs and visions; 5) 'Management ability' – which is the ability to run a clinic, medical unit or association and 6) 'Enjoying oneself' – which means that doctors need to feel an attraction to community medicine, in terms of it being fun and challenging for them. The authors felt that the study might contribute to the design of a personalised curriculum to develop community medical leaders.<sup>12</sup>

In short, leadership can be construed as a means of shaping the goals, motivations and actions of others to initiate change or maintain stability.<sup>13</sup> Other researchers have adopted a social perspective to conceptualise leadership, arguing that leadership activity is defined or constructed through the interaction of leaders and followers during the execution of leadership tasks.<sup>14</sup>

According to some scholars, the teaching of leadership skills should start as early as in medical school.<sup>15</sup> As predicted, formal education in leadership skills has been increasingly implemented into the curricula of modern medical schools.<sup>16</sup> Several studies have also started to address the effectiveness of leadership training programs in the medical education setting. In one study, for instance, a peer-led structured academic mentoring program was proven a useful tool to improve leadership skills of young mentors.<sup>17</sup> In another project, the development of an unique leadership training approach and subsequent appraisals of the model eventually led to the development of an enterprise-wide leadership institute dedicated to guide leadership development strategies in the healthcare setting.<sup>18</sup> Of note, training in medical leadership skills has been increasingly available 'on demand' from many institutions across the globe – with a growing role of distance learning, which is particularly important for physicians who are often unable to stay away from their medical practices for long periods. Finally, as shown by the number of publications in PubMed with the search terms 'leadership' and 'medical' (which have increased from as few as 5-15 before the late 1960s to more than 2000 in 2019 alone), the scientific interest in the field of leadership development has risen sharply in recent decades.<sup>19</sup>

In the early 2000s, Violato et al. (2009)<sup>15</sup> adapted from a business leadership questionnaire to address the required competencies for academics involved with medical education. This survey was further developed by Çitaku et al. (2012)<sup>11</sup> into a 63-item questionnaire, which was eventually applied to a sample of 229 healthcare professionals who held academic positions in medical education. This survey disclosed interesting findings about the participants' perceptions on the required leadership skills in their field.

However, the valuation of specific leadership competencies is known to be highly dependent on the cultural context, as previously demonstrated by findings of the GLOBE survey performed in the corporative realm.<sup>20</sup> The Çitaku et al. (2012)<sup>11</sup> survey, though a multi-national and multi-institutional work, was restricted to North-American (NA) and European (EU) (i.e. affluent) countries.<sup>11</sup> In 2018, we felt that similar data should be collected from other cultures and world regions and set out to apply a slightly modified version of the survey to a sample of 217 Latin-American (LA) physicians from oncology and related fields who held an active leadership position at their institution.<sup>21</sup>

The choice of a mainly 'oncology setting' had to do with the specialty practiced by the main author and most of the co-authors and their easier access to the contributing medical societies/groups. This survey disclosed interesting findings, in a way confirming the hypothesis that the valuation of the required leadership competencies would not perfectly match the NA/EU study results.

Because of the large number of participants in this survey, several subgroup analyses were performed.<sup>21</sup> Most of the participants were from Brazil (135; 63.0%), followed by Mexico (61; 28.5%). Subgroup analyses of the Brazilian participants versus those from other LA nations disclosed significant differences in physician perceptions, especially in terms of Brazilians placing a higher value on 4 of the 5 sets of competencies: task management, social responsibility, self-management and leading others.<sup>21</sup> Among all subgroup analyses performed, country of medical practice showed the most pronounced differences, which suggested the existence a significant level of cultural heterogeneity in our sample.

Therefore, we decided to perform further analyses specifically focused on the Brazilian subgroup of participants, with the aim to more efficiently analyze other variables from the scope of a single selected nation.

## OBJECTIVES

The objectives of the main study were as follows: 1) to offer the survey to a population of LA physicians from the oncology community and related areas who held an active leadership position; 2) to compare the results with those of the previous NA/EU survey; and 3) to investigate potential interactions between LA physicians' perceptions of leadership competencies and factors such as medical specialty, country, sex, type of medical practice (private versus public), age, years of experience in oncology and in a leadership position.

The objectives of the current study were as follows: 1) to compare the results of the Brazilian subgroup of participants with those of the previous NA/EU survey; and 2) to investigate potential interactions between Brazilian physicians' perceptions of leadership competencies and factors such as medical specialty, sex, type of medical practice (private versus public) and seniority as defined by age, years of experience in oncology and in a leadership position.

## MATERIAL AND METHODS

The methodology of this study, as well as the full details of the study population, have been published elsewhere.<sup>21</sup> Briefly, from November 13, 2018, to December 12, 2018, the survey was sent to close to 8,000 physicians from LA countries who were members of one of the medical societies or groups of specialists who agreed to participate, namely the Brazilian Society of Clinical Oncology; 2) the Brazilian Society of Mastology; 3) the Mexican Society of Mastology; 4) the Latin American Cooperative Oncology Group; 5) the Brazilian Society of Pathology; and 6) the Mexican Society of Oncology.

Of note, the distribution of the survey had to comply with the internal regulations of each contributing institution. For instance, some of the medical societies/groups allowed a single dispatch of the e-mails, while other allowed two or an unlimited number. Furthermore, the Brazilian Society of Radiation Oncology was unable to officially contribute with the project, but the survey was circulated in a WhatsApp group held by the members so that radiation oncologists were eventually properly represented. The survey was filled electronically by the participants using the SurveyMonkey website. The invitation clearly stated that only physicians who actively held a leadership position should take the questionnaire, which probably accounts for the lower number of responses (n=217) eventually collected in the original study.

As previously stated, for only three of the medical societies/groups (the Brazilian and Mexican Societies of Mastology and the Brazilian Society of Pathology) cancer care was not an exclusive activity. The unique characteristics of these medical societies/groups have been previously described in detail.<sup>21</sup>

The survey contained 63 items, which were grouped into 5 major sets of competencies: task management, social responsibility, self-management, leading others, and innovation. The respondents rated questions from 1-5 (less important to most important) and we considered a score of 4 or 5 as a 'positive' response (i.e., the competence was 'highly valued').

The analyses were performed in terms of proportion of participants who responded with 4 or 5 (i.e., 'this competence is important' or 'this competence is very important', respectively). Respondents' characteristics and the responses were summarized using descriptive statistics. Differences between groups were analyzed using contingency tables ( $\chi^2$  test). Internal consistency reliability was computed (Cronbach's  $\alpha = .830294$ ). All analyses were performed using the SAS statistical software (version 9.4; SAS Institute, Cary, NC). A significance level of 5% was applied.

Both the published and current study were waived from obtaining informed consent forms (ICF) by the institutional review board (IRB) of the *Pontifícia Universidade Católica do Rio Grande do Sul* – to whom the LACOG group reports to.

## RESULTS

Characteristics of the Brazilian survey population are depicted in Table 1. A total of 135 responses were available for the analyses. An imbalance in gender was evident in the current sample, with 84 (62.2%) males versus 51 (37.7%) females. Overall, most of the respondents were younger than 45 years of age (71/52.5%), had more than 10 years of experience in oncology (108/80%) and less than 10 years in a leadership position (75/55.5%). Sixty-nine percent defined themselves as primarily working in a private institution, and the majority were clinical oncologists (72/53.3%), followed by surgical oncologists (31/22.9%) and other specialists (24/17.7%).

**Table 1.** Characteristics of the 135 participants from Brazil.

| Information of 135 participants  | Total - n (%) |
|--|---------------|
| <b>Gender</b>  |               |
| Male   | 84 (62.22)    |
| Female   | 51 (37.78)    |
| <b>Age (Median = 44; Range = 25-72)</b>                                      |               |
| <45 years  | 71 (52.59)    |
| ≥45 years  | 64 (47.41)    |
| <b>Years of experience in oncology (Median = 16; Range = 0-43)</b>           |               |
| <10 years  | 27 (20.00)    |
| ≥10 years  | 108 (80.00)   |
| <b>Years of experience in leadership position (Median = 8; Range = 1-51)</b> |               |
| <10 years  | 75 (55.56)    |
| ≥10 years  | 60 (44.44)    |
| <b>Type of institution that best defines your main leadership role</b>       |               |
| Private  | 94 (69.63)    |
| Public   | 41 (30.37)    |
| <b>Main specialty</b>  |               |
| Clinical oncology  | 72 (53.33)    |
| Radiation oncology   | 8 (5.93)      |
| Surgical oncology  | 31 (22.96)    |
| Other  | 24 (17.78)    |

When comparing the Brazilian versus NA/EU participants' responses, a higher proportion of the former group placed a high value on task management competencies (93.3 versus 87.0%,  $p < 0.0001$ ) (Table 2). Social responsibility competencies were rated second in importance by Brazilian physician-leaders, with no differences between the Brazilian and NA/EU participants' scores for this category.

We performed subgroup analyses within the Brazilian respondents (Table 3). In the clinical oncology versus other specialties comparison, considering only the analyses that achieved statistical significance, social responsibility competencies were more highly valued by clinical oncologists as compared to others (90.5% versus 86.6%;  $p = 0.0124$ ), whilst leading others (81.2% versus 88.2%;  $p < 0.0001$ ) and innovation competencies (85.67% versus 89.34%;  $p = 0.0166$ ) were placed a lower value by clinical oncologists.

No statistically significant differences in the responses were observed between physicians working mainly in the private versus public sectors, in the male versus female comparison, and in the analyses that addressed the effect of seniority based on age or years of experience in oncology and in leadership positions (Table 3).

## DISCUSSION

To the best of our knowledge, this LACOG/ALSS survey was the first to address leadership competencies in LA physicians.<sup>21</sup> Our previous analyses disclosed significant differences in terms of how LA physicians value specific leadership competencies as compared with their NA/EU counterparts (though in the NA/EU survey, physicians represented only 40% of the participants).<sup>11</sup>

**Table 2.** Percentage of responses  $\geq 4$  for each group.

|   | Brazil - (%) | European/North American - (%) |                   |
|---|--------------|-------------------------------|-------------------|
| <b>Task management competencies</b>       | 93.33        | 87.00                         | <b>&lt;0.0001</b> |
| <b>Social responsibility competencies</b> | 88.74        | 87.48                         | 0.2178            |
| <b>Self-management competencies</b>       | 88.72        | 87.55                         | 0.2709            |
| <b>Leading others competencies</b>        | 84.53        | 84.71                         | 0.8358            |
| <b>Innovation competencies</b>            | 87.39        | 85.31                         | 0.0397            |

**Table 3.** Subgroup analyses of the Brazilian participants.

| Subgroup                                       | % of respondents who scored competency as 4 (important) or 5 (very important) |                       |                  |                  |                  |
|--|---|-----------------------|------------------|------------------|------------------|
|  | Task Management   | Social Responsibility | Self-Management  | Leading Others   | Innovation       |
| <b>Male</b> (n=84, 62.22%)                     | 92.69   | 88.08                 | 88.52            | 84.05            | 86.55            |
| vs.  | vs.   | vs.                   | vs.              | vs.              | vs.              |
| <b>Female</b> (n=51, 37.78%)                   | 94.38%  | 89.97%                | 89.07%           | 85.32%           | 88.76%           |
|  | ( $p = 0.3119$ )  | ( $p = 0.2450$ )      | ( $p = 0.7447$ ) | ( $p = 0.3890$ ) | ( $p = 0.1609$ ) |
| <b>Age &lt;45</b> (n=71, 52.59%)               | 92.14   | 88.12                 | 88.73            | 84.10            | 86.90            |
| vs.  | vs.   | vs.                   | vs.              | vs.              | vs.              |
| <b>Age <math>\geq 45</math></b> (n=64, 47.41%) | 94.64%  | 89.27%                | 88.71%           | 84.51%           | 87.93%           |
|  | ( $p = 0.1235$ )  | ( $p = 0.4703$ )      | ( $p = 0.9912$ ) | ( $p = 0.7771$ ) | ( $p = 0.4977$ ) |
| <b>Years of experience in oncology:</b>        | 92.06   | 87.65                 | 90.91            | 83.43            | 85.71            |
| <b>&lt;10</b> (n=27, 20%)                      | vs.   | vs.                   | vs.              | vs.              | vs.              |
| vs.  | 93.64%  | 89.01%                | 88.18%           | 84.80%           | 87.81%           |
| <b><math>\geq 10</math></b> (n=108, 80%)       | ( $p = 0.4367$ )  | ( $p = 0.4903$ )      | ( $p = 0.1830$ ) | ( $p = 0.4434$ ) | ( $p = 0.2732$ ) |
| <b>Years of experience in leadership:</b>      | 92.56   | 88.00                 | 89.21            | 83.76            | 87.40            |
| <b>&lt;10</b> (n=75, 55.56%)                   | vs.   | vs.                   | vs.              | vs.              | vs.              |
| vs.  | 94.29%  | 89.66%                | 88.11%           | 85.49%           | 87.37%           |
| <b><math>\geq 10</math></b> (n=60, 44.44%)     | ( $p = 0.2903$ )  | ( $p = 0.2930$ )      | ( $p = 0.5053$ ) | ( $p = 0.2285$ ) | ( $p = 0.9799$ ) |
| <b>Private</b> (n=94, 69.63%)                  | 93.76   | 88.26                 | 87.86            | 84.01            | 86.29            |
| vs.  | vs.   | vs.                   | vs.              | vs.              | vs.              |
| <b>Public</b> (n=41, 30.37%)                   | 92.33%  | 89.84%                | 90.69%           | 85.71%           | 89.90%           |
|  | ( $p = 0.4197$ )  | ( $p = 0.3548$ )      | ( $p = 0.1139$ ) | ( $p = 0.2721$ ) | ( $p = 0.0602$ ) |
| <b>Clinical Oncology</b> (n=72, 53.33%)        | 92.05   | 90.58                 | 87.69            | 81.22            | 85.67            |
| vs.  | vs.   | vs.                   | vs.              | vs.              | vs.              |
| <b>Others</b> (n=63, 46.67%)                   | 94.78   | 86.64%                | 89.90%           | 88.29%           | 89.34%           |
|  | ( $p = 0.0928$ )  | ( $p = 0.0124$ )      | ( $p = 0.1800$ ) | ( $p < 0.0001$ ) | ( $p = 0.0166$ ) |

vs. = Versus.

We performed this additional analysis focused specifically on the Brazilian population because of the significant differences in the content of the responses observed in most domains when Brazilians were compared with physicians from other LA countries (mostly from Mexico).<sup>21</sup> As previously mentioned, significant cultural influence in the valuation of specific leadership competencies has been documented in other domains,<sup>20</sup> and it could be the case that 'being from LA' was not homogeneous enough for an optimal evaluation of the other variables. Apart from language (Portuguese versus Spanish), we found no other factors (such as age or years of experience) that could justify the differences in the responses between the Brazilian and other LA participants so that, most likely, they are attributable to cultural differences.<sup>21</sup>

Our hypothesis was that, by focusing only on participants from a specific country, we would be able to more reliably interpret the other variables. Furthermore, Brazil is the country with the largest population in LA (as of 2018, 209.469.323 – representing 32.6% of the LA population),<sup>22</sup> so that a specific analysis of this culturally and language-homogenous subgroup is justifiable. Our large sample size, with a wide representation of Brazilian participants, provides sufficient statistical power for the current analysis.

For the comparison between Brazilian versus NA/EU respondents, the results mirrored those of the full population analysis, with a higher proportion of Brazilian participants placing a high value on task management competencies as compared to NA/EU (93.33 versus 87.00%,  $p < 0.0001$ ). However, social responsibility rated second in the current analysis, as compared to third in the primary study analysis. The potential reasons for the differences between the LA versus NA/EU survey have been addressed elsewhere,<sup>21</sup> but might include the fact that physicians were underrepresented in the NA/EU survey, in which they tended to place lower value on social responsibility competencies as compared to non-physicians (we previously hypothesized that non-physicians might have a deeper level of emotional involvement with patients and their families, potentially making them more sensitive to the social hurdles associated with the course of their illnesses).<sup>21</sup>

Results from this study show that women were slightly less underrepresented within the Brazilian subgroup, though the differences were small. Of note, in Brazil, as of 2017, 54.4% of the workforce were male, and since 2009, more female than male doctors have been registered – which probably rule out an underrepresentation of female doctors in the country as a whole as the cause for the female underrepresentation found in this survey.<sup>23</sup> In the main study analysis, female physicians from LA placed a higher value on innovation competencies as compared to males,<sup>21</sup> and we provided evidence that this had already been suggested by studies performed in other domains.<sup>24,25</sup> In the current analysis, however, no such differences were observed.

It could be speculated that Brazilian female physician-leaders indeed differ from their LA (mainly Mexican) counterparts in this aspect or, instead, this could be simply due to statistical bias.

One of the most striking differences between the main and the current study analysis was in terms of the effect of seniority on the results of the survey. In the full study population, more senior leaders as assessed by age ( $\geq 45$  years), years of experience in oncology ( $\geq 10$  years), or years of experience in a leadership position ( $\geq 10$  years), consistently placed a higher value on task management and leading others competencies,<sup>21</sup> which we believed could be due to the long time required to acquire these complex skills. However, no such differences were observed in the current analysis, for any of the definitions of seniority. The reasons for these differences between Brazilian and other LA physician-leaders' responses should be further explored but could indeed represent cultural differences reflected in their responses.

In terms of the clinical oncology versus other specialties comparison, the results matched those of the primary analysis, with social responsibility competencies being more highly valued by clinical oncologists as compared to others (90.58% versus 86.64%;  $p = 0.0124$ ), and leading others (81.22% versus 88.29%;  $p < 0.0001$ ), and innovation competencies (85.67% versus 89.34%;  $p = 0.0166$ ) being placed a lower value by clinical oncologists (Table 3). Also consistent with the main study findings, no differences were observed in the responses placed by physicians working mainly in the private versus public sector.<sup>21</sup>

The limitations and strengths of our survey have been addressed elsewhere.<sup>21</sup> The current analysis included 135 participants, which represents 63% of the study population. Although subgroup analyses should always be interpreted with caution, because survey samples are often estimated on a convenience basis and few such studies report on sample sizes larger than 100 participants, we assume the current sample size is sufficient to provide statistical power for the analyses. One strength of the current analysis is the fact that, by focusing on participants from a specific country, we were able to eliminate a significant variable which was country of practice (with the language and all the cultural differences expected between a Brazilian and a [mainly] Mexican sample), potentially allowing for a more reliable analysis of the other variables.

## CONCLUSION

This analysis provides further evidence for the existence of significant cultural differences within the LA participants, and that these cultural variations can significantly affect the valuation of specific ML competencies. Because training physicians and medical students in leadership skills is becoming a common practice, our data might have implications in terms of helping make the content of these programs more suitable to the region of the world in which they are applied.

Finally, future studies addressing ML competencies should consider the impact of culture on the results and enroll a large sample of participants to allow for multiple subgroup analyses.

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