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Geriatric and gerontological physiotherapy in focus: a cross-sectional survey of education, clinical practice, and service availability across world physiotherapy member nations

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Abstract

Background The ageing global population necessitates specialised geriatric/gerontological physiotherapy services (GPTS) to address age-related conditions. We explored the current state of geriatric/gerontological physiotherapy (GPT) academic programmes and clinical practice among World Physiotherapy member nations (WPMNs) and identified factors, including socioeconomic indicators, that predicted the GPTS globally.

Methods We conducted an online cross-sectional survey between April 1 and September 19, 2024, inviting official representatives of the 128 WPMNs to answer questions relating to GPT academic programmes and clinical services and practices. We also extracted the Human Development Index (HDI), life expectancy, and Gross National Income (GNI) per capita for each WPMN from the United Nations Development and World Bank databases. Data was analysed using descriptive statistics, a map, bubble charts, and logistic regression models.

Results Sixty-seven countries (67/128, 52.3% response rate) completed the survey. Among them, 34 (50.7%) and 19 (28.4%) reported having geriatric/gerontology modules in their entry-level and graduate-level physiotherapy programmes, respectively. Additionally, 20 (29.9%) and 13 (19.4%) reported having entry-level geriatric/gerontology clinical placement and graduate-level clinical training, respectively. Physiotherapists were members of interdisciplinary geriatric/gerontological teams in Africa (9/11, 81.8%), Asia Western Pacific (10/16, 62.5%), Europe (15/27, 55.6%), North America Caribbean (4/7, 57.1%), and South America (5/6, 83.3%), but they can only lead the teams in few countries: Africa (1/11, 9.1%), Asia Western Pacific (4/16, 25.0%), Europe (5/27, 18.5%), North America Caribbean (2/7, 28.6%), and South America (2/6, 33.3%). GPTS were more common in countries with graduate-level geriatric physiotherapy academic programmes ($OR = 33.47$, 95% CI: 1.36, 822.39, $p = 0.032$) GPT Availability in Practice Act ($OR = 41.93$, 95% CI: 1.66, 1059.78, $p = 0.023$), and higher HDI ($OR = 5.32e+07$, 95% CI: 49.78, $5.67e+12$, $p = 0.003$). Europe and North America Caribbean regions had lower older-adult-to-physiotherapist ratios and a higher life expectancy, HDI, and GPTS availability than other World Physiotherapy regions.

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Conclusion Geriatric/gerontological PT education and clinical practice are evolving, especially at the entry-level training across WPMNs; however, extra effort is required to enhance graduate specialization to cater to the emerging ageing population.

Keywords Ageing population, Health care, Older adult, Practice scope, World

Introduction

Ageing is a globally relevant phenomenon [1] characterised by a gradual decline in physical, physiological, cognitive, and social functioning [2]. It affects people of all racial backgrounds, cultures, social classes, and geographical locations [3]. The global population of individuals aged 65 years and older will increase from 800 million (10%) to approximately 2 billion people, constituting 22% of the world's population in 2030 [4, 5]. The anticipated increase in the ageing population would come with a higher prevalence of age-related conditions and a concomitant demand for health and social services [5–7]. Geriatric syndromes, such as falls, fragility fractures, and frailty, are amenable to physiotherapy, leading to increasing demand for geriatric physiotherapists globally [8]. However, the rate of specialisation in geriatric and gerontological physiotherapy, development of programmes and infrastructures is low, creating a predictable deficit in specialist geriatric services in the near future [9–11].

A geriatric physiotherapist is a board-certified physiotherapist with a well-defined core competency who has received specialist training to provide a person-centred, evidence-based, non-ageist, holistic assessment and care to older adults, including prevention, treatment, and rehabilitation within an interdisciplinary team [12, 13]. The terms gerontological and geriatric physiotherapist are often used interchangeably, and the definition of a gerontological physiotherapist is yet to be universally conceptualised. However, building on the definition of a gerontologist [14], a gerontological physiotherapist can be seen as a physiotherapist with an advanced degree in gerontology, often not board certified, who focuses on understanding the ageing process, ageing impact on physical function, and prevention of age-related impairments, considering the social, psychological, financial, environmental, and cognitive aspects of older adults' well-being. Simply put, a geriatric physiotherapist is a clinician specialised in treating older adults with ageing-related medical conditions, while a gerontological physiotherapist focuses on health promotion, research, and policy advocacy related to the well-being of older adults.

Discrepancies in geriatric/gerontological physiotherapy (GPT) education and practice have hindered a global consensus on the core competency profile of physiotherapists who specialise in providing care to older adults [15]. There exist variations in geriatric/gerontological contents in the entry-level and graduate programmes curricula and the availability of residency training [10].

These variations have led to some implicit definitions of who a geriatric/gerontological physiotherapist is, highlighting differences in practice across the globe. These differences include the role of physiotherapists as first-contact practitioners with direct access privileges [16], their membership and responsibilities within the geriatric interdisciplinary teams, and the status of the Physiotherapy Practice Act relating to older adult care [12]. The Physiotherapy Practice Act is a legal framework that regulates the practice, standards, and professional conduct of physiotherapists within a specific jurisdiction (country, state, or province) [17]. Additionally, variations exist in the proportion of public hospitals equipped for geriatric physiotherapy and the extent of insurance coverage for older adult care [10, 18, 19]. Assessing the scope of geriatric and gerontological physiotherapy practices in different parts of the world is essential for promoting global standards of care for older adults [8, 10, 20], in preparation for an increase in the ageing population and age-related conditions.

Life expectancy, the Human Development Index (HDI), the ageing population rate, and Gross National Income (GNI) per capita are critical indicators of inequality that significantly influence community programs aimed at promoting healthy ageing [21, 22]. These factors play a vital role in the education and training of specialised healthcare professionals, including physiotherapists. Countries with higher HDI and GNI tend to allocate more resources toward the education and training of healthcare professionals [23]. This investment facilitates advancements in specialised care, particularly in GPT practices. Increased government expenditure on physiotherapy services for older adults could foster expanded and specialised roles for physiotherapists, highlighting the necessity for comprehensive education and training programs in GPT at both the entry and graduate levels, including residency programs. The ageing population rate could also influence a nation's ratio of older adults to physiotherapists, impacting insurance and reimbursement policies for geriatric/gerontological physiotherapy services (GPTS). However, no evidence supports this in the current literature— a gap our study aims to fill.

The study was anchored on the World Health Organization (WHO) Decade of Healthy Ageing 2021–2030 initiative [24]. Anticipating the WHO's 2025 rollout of Integrated Care for Older People (ICOPE) within global primary healthcare [24], this paper strategically informs on the situation of geriatric physiotherapy training,

specialisation, and service availability, emphasising the relevance of GPTS to the ICOPE initiative [25]. Integrated care models are essential for managing chronic diseases and complex health conditions often associated with ageing [24, 25]. By mapping the global landscape of geriatric physiotherapy, we aim to stimulate dialogue on best practices and develop strategies to improve the health and well-being of older adults worldwide. Therefore, this study aimed to explore the current state (availability, scope, descriptions) of GPT academic programmes and clinical practice among World Physiotherapy member nations (WPMNs) while identifying the factors, including socioeconomic indicators, that influence GPTS globally.

Methods

Study design

The study was a cross-sectional multilingual online survey. York University Research Ethics Board granted us an ethical waiver, citing that the survey questions are informative rather than opinionated. The representatives (president, secretary, or designate) of each WPMN were given detailed information about the study objectives, participants' anonymity, and data confidentiality through their official email addresses [26]. They also signed informed consent before participating. The study was reported following the Consensus-Based Checklist for Reporting of Survey Studies (CROSS) [27].

Sample characteristics

The absence of comprehensive information, lists, or data regarding the number of countries with well-established or emerging GPT education, training, and practice prompted our decision to consult official representatives from the WPMNs. Of the 195 countries of the world, 128 are registered member nations of the World Physiotherapy [26], as of 15 September 2024. The complete list of the associations can be found at <https://world.physio/our-members>. Only the official representatives of the WPMNs, as listed on the website, were invited to complete the survey. The inclusion criteria were the willingness of the physiotherapy association representatives to sign the informed consent form and complete the questionnaire. There were no exclusion criteria; hence, the sample was conveniently selected.

Survey

A five-member committee comprising faculty members and doctoral students knowledgeable in survey design developed a bespoke questionnaire checklist (Supplementary file 1). The drafted survey, alongside the study objectives, was face and content validated by three geriatric and three gerontological physiotherapy experts through an E-Delphi approach [28]. Panelists were

considered experts if they had at least 10 years of clinical experience in geriatric physiotherapy or postgraduate training in gerontological physiotherapy with a minimum of 10 years of university teaching experience. The experts were asked to evaluate the questionnaire's relevance, comprehensiveness, and comprehensibility, including the recall period and response options. Three E-Delphi rounds were completed until at least 85% of the panelists rated the questionnaire as adequate on a three-point scale (1– inadequate, 2– moderate, and 3– adequate).

The questionnaire has 23 items grouped into demographics ($n=2$), geriatric/gerontology definition and concept ($n=5$), educational programme/training ($n=6$), physiotherapy practice ($n=4$), geriatric/gerontological physiotherapy services (GPTS) availability and insurance ($n=2$), remuneration and cost ($n=2$), and national/regional geriatric/gerontological physiotherapy (GPT) interest group ($n=2$). The demographics section included information on the country and designation of the representative. The geriatric/gerontology definition and concept comprised open-ended questions on the term used in the country (geriatric/ gerontological/ both), country-specific definitions, differences between both concepts and a description of the roles. The educational programme/training category collected information about the availability of geriatric content in the entry-level, graduate clinical, and graduate academic curricula, geriatric-focused clinical internship, specialisation opportunities and processes. The physiotherapy practice items collected information on interdisciplinary team membership and leadership, first contact provider, and availability of GPT in the Practice Act. All the questions were optional, and none was a prerequisite to complete the survey. The English version of the questionnaire was translated into Spanish, French, Portuguese, and Arabic (Supplementary file 1) by bilingual native speakers. The process included forward translation into the target language, back-translation into English by the same translator after one week, and a subsequent accuracy review.

Procedure for data collection

An inquiry email was sent to the representatives of each of the 128 national associations through the email addresses provided in their profile on the World Physiotherapy (WP) website. Sending the custom invite to the specific email addresses of national associations ensured no multiple responses. The email contained an informed consent and a survey link hosted in Qualtrics®. In the email, we recommended that the representative engage with any other association members who could provide the most precise and relevant information concerning GPT education, training, and clinical practice. For instance, if applicable within their country, they might consider contacting the presidents of specialised

sub-groups focused on GPT. Participants who provided consent proceeded to the survey, while those who declined consent exited. Each member nation that did not respond to the survey after one week of the initial contact received three personalised email reminders: two weeks, a week, and three days before the end of the survey. Data was collected between April 1 and September 19, 2024.

Each country's HDI and life expectancy as of 2022 were obtained from the United Nations Development Programme [11] database. Similarly, the GNI per capita older adult population data for each country were obtained from the World Bank [29] database. The number of practising physiotherapists in each country was obtained from the World Physiotherapy [26].

Variables

The dependent variable was the percentage availability of GPTS in public hospitals, categorised as an ordinal variable (no response, less than 25%, 25–50%, 71–75%, above 75%) and nominal variable (no = 0, yes = 1). The independent variables included nominal and continuous variables. Nominal variables (all categorised as no = 0, yes = 1) were physiotherapy Practice Act availability, health insurance coverage of GPTS, national policy on ageing availability, availability of geriatric/gerontological content in entry-level, graduate clinical, graduate academic curricula, and availability of national/ regional GPT interest group. The continuous variables were entry-level physiotherapy remuneration (USD), average cost of GPT appointment (USD), older adults to physiotherapists population ratio, life expectancy at birth (years), HDI, and GNI per capita (USD).

Data analysis

Data was analysed using Statistical Package for Social Sciences Version 28 (SPSS IBM, Armonk, NY). The data was prepared by recoding variables and tested for multivariate outliers using Cook's distance. Descriptive statistics of frequency, percentages, mean, and standard deviation were used to summarise the data. The bivariate association between GPTS availability and educational programme/training, physiotherapy practice factor, and socioeconomic factors was analysed using bivariate binary logistic regression. Multivariate binary logistic regression was used to obtain the set of factors that could significantly predict GPTS availability through the forward-Wald-entry stepwise approach. Visualisation was completed using R version 4.4.1 (using tidyverse, ggplot2, dplyr, sf, and rnatualearth packages).

The open-ended questions were analysed using conventional content analysis because there was no prior framework for coding the subject matter [30]. Two authors (OKO and ACO) with expertise in qualitative studies

independently coded the verbatim responses, identifying the obvious and latent meanings of geriatric and gerontological physiotherapy. They also examined attributes that qualify each construct, including level of training, scope of practice, need for certification, and specific jurisdictional contexts. Each coder independently defined geriatric and gerontological physiotherapy, and the rest of the team met to harmonise the definition.

Results

Of the 128 WPMNs, 67 completed the survey, accounting for a 52.3% response rate. Among the 67 respondents, 55 provided complete responses, while 12 submitted partial responses. The 67 nations cut across the five WP regions: South America ($n=6$), North America Caribbean ($n=7$), Africa ($n=11$), Asia Western Pacific ($n=16$), and Europe ($n=27$). The survey was mostly filled out by the President/Chairperson (28/67, 41.8%) or Secretary (11/67, 16.4%) of the national physiotherapy associations or a delegate, such as the chair of the national geriatric physiotherapy interest group (28/67, 41.8%). The mean $\pm$ SD life expectancy, HDI, and GNI per capita of the surveyed WPMNs were 75.20 ± 7.60 years, 0.79 ± 0.15 , and USD $25,277.19 \pm 26,598.57$ respectively. The mean (range) cost for a GPT consultation session was USD 45.56 (USD 5.00– USD 150.00), while the entry-level physiotherapist's monthly salary was USD 1,773.27 (USD 150.00– USD 6,700.00).

Myanmar (Asia Western Pacific, 1:10562) and Niger (Africa, 1:6148) were the countries with the largest older-adult-to-physiotherapist population ratios (Fig. 1). Conversely, two countries in the European region, Macedonia (1:18) and Luxembourg (1:53), had the smallest ratio. Figure 2 is a world map showing the percentage availability of GPTS among surveyed nations. Most WPMN reported that less than 25% of their public hospitals offer GPTS.

Physiotherapy care terminologies

Among the 67 WPMNs, the common terminology for physiotherapy care for older adults was geriatric physiotherapy (42/67, 62.7%); other countries used various synonyms terms such as physiotherapy for the elderly, older adult physiotherapy, and physiotherapy with older people. In 41 (61.2%) of the 67 responding WPMNs, geriatric physiotherapy was described as specialised physiotherapy care for older adults, five (7.5%) described it as healthcare for older adults, one (1.5%) physiotherapy services in a geriatric ward, one (1.5%) screening programme that includes acute care, balance, and gait, one (1.5%) terminology used in medicine and rehabilitation, one (1.5%) complementary but essential services when treating various diseases associated with ageing, but 17 (25.3%) did not respond.

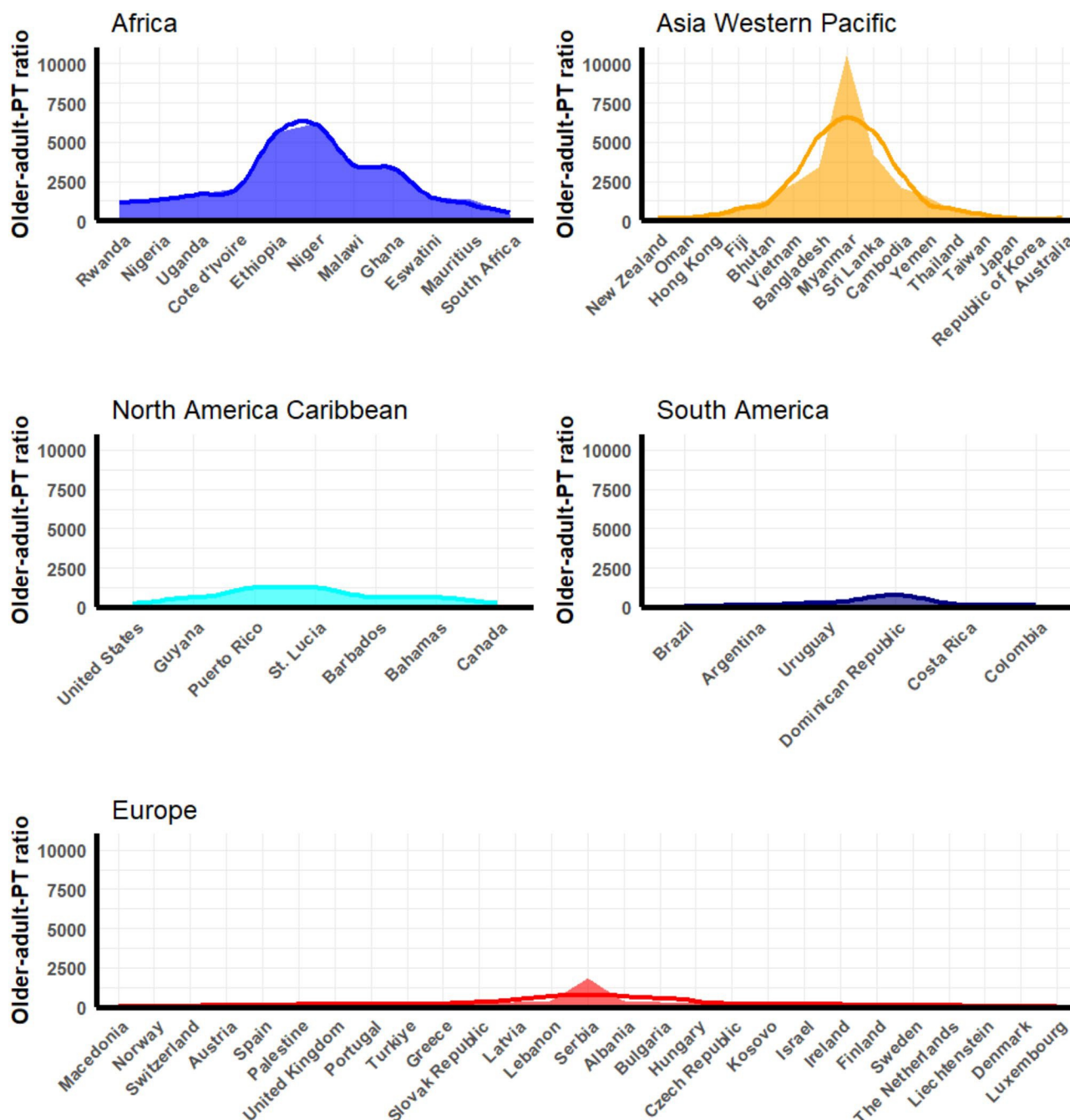


Fig. 1 Older adults to physiotherapist population ratio across WPMNs and regions

When asked how gerontological physiotherapy is described in their countries, 28/67 (41.8%) defined the term as follows: same as geriatric physiotherapy (12/67, 17.9%), the study of the ageing process (9/67, 13.4%), the academic/clinical study of the specialisation in geriatric physiotherapy (1/67, 1.5%), fall prevention (1/59, 1.5%), health care for older adults (1/59, 1.5%), health condition for older adults that require physiotherapy intervention (1/59, 1.5%), physiotherapy and personal care for older adults (1/59, 1.5%), physiotherapy care for stable

older adults but with chronic conditions (1/59, 1.5%), and working in a home for the aged (1/59, 1.5%).

Geriatric/gerontological content in physiotherapy education and clinical training

Table 1 shows that 34 (50.7%) and 19 (28.4%) of the 67 surveyed WPMNs had geriatric/gerontology modules/course content in their entry-level and graduate-level physiotherapy programmes, respectively. Also, 20/67 (29.9%) and 13/67 (19.4%) reported having entry-level

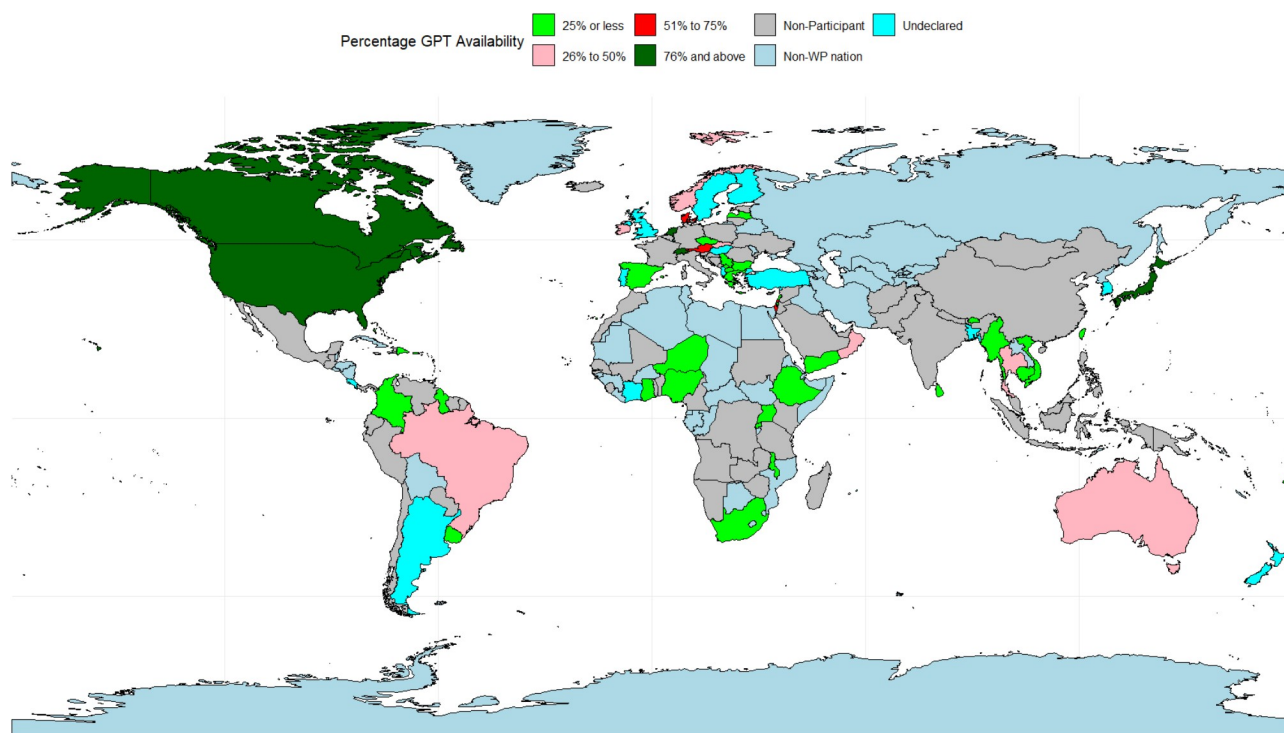


Fig. 2 Geriatric physiotherapy availability in public hospitals across WPMNs

Table 1 Summary of geriatric and gerontological physiotherapy academic programmes, clinical practices, and service availability across surveyed WPMNs (N = 67)

Variable	Yes n (%)	No n (%)	Unsure n (%)	Undeclared n (%)
Entry-level geriatric/gerontology module	34 (50.7)	17 (25.5)	8 (11.9)	8 (11.9)
Entry-level geriatric/gerontological-focused clinical placement	20 (29.9)	28 (41.8)	9 (13.4)	10 (14.9)
Graduate-level GPT academic training	19 (28.4)	35 (52.2)	5 (7.5)	8 (11.9)
Graduate-level GPT clinical training	13 (19.4)	40 (59.7)	4 (6.0)	10 (14.9)
Specialisation in GPT	20 (29.9)	27 (40.3)	8 (11.9)	12 (7.9)
Physiotherapists participate in interdisciplinary geriatric/gerontological team	43 (64.2)	8 (11.9)	7 (10.5)	9 (13.4)
Physiotherapists lead interdisciplinary geriatric/gerontological team	15 (22.4)	22 (32.8)	20 (29.9)	10 (14.9)
Older adults' access to geriatric/gerontological physiotherapists	36 (53.7)	26 (38.8)	4 (6.0)	1 (1.5)
GPT Practice Act	24 (38.5)	37 (55.2)	5 (7.5)	1 (1.5)
Health insurance coverage for GPT care	30 (44.8)	14 (20.9)	13 (19.4)	10 (14.9)
National GPT special interest group	31 (46.3)	32 (47.7)	2 (3.0)	2 (3.0)
Regional GPT special interest group	12 (17.9)	17 (25.4)	33 (49.3)	5 (7.5)

GPT: Geriatric/gerontological physiotherapy

geriatric/gerontology clinical placement and graduate-level clinical training, respectively. Thirty-one of the 67 WPMNs (46.3%) had a geriatric/gerontological special interest group within their national physiotherapy association. Moreover, 12/67 (17.9%) reported having a regional GPT special interest group.

A WP regional comparison of the availability of geriatric/gerontology modules or course content in entry-level physiotherapy programmes across 67 WPMN revealed that 7/11 (63.6%) of programmes in Africa, 7/16 (43.8%) in Asia Western Pacific, 13/27 (48.1%) in Europe, 3/7

(42.9%) in North America Caribbean, and 4/6 (66.7%) in South America included such modules. At the graduate level, only 1/11 (9.1%) of African programmes, 6/16 (37.5%) in Asia Western Pacific, 9/27 (33.3%) in Europe, 2/7 (28.6%) in North America Caribbean, and 1/6 (16.7%) in South America offered specialised geriatric/gerontological physiotherapy courses. Graduate-level clinical (residency) training in geriatric/gerontological physiotherapy was also limited, with 1/11 (9.1%) in Africa, 3/16 (18.8%) in Asia Western Pacific, 7/27 (25.9%) in Europe, 1/7 (14.3%) in North America Caribbean, and 1/6 (16.7%)

in South America offering such training. Supplementary file 2 summarises the data on geriatric/gerontological physiotherapy training.

Physiotherapist role in geriatric/gerontological care

The responses to whether physiotherapists are part of the interdisciplinary geriatric/gerontological team showed that physiotherapists are recognised as key members of the teams in Africa (9/11, 81.8%), Asia Western Pacific (10/16, 62.5%), Europe (15/27, 55.6%), North America Caribbean (4/7, 57.1%), and South America (5/6, 83.3%). They are also eligible to lead these teams in Africa (1/11, 9.1%), Asia Western Pacific (4/16, 25.0%), Europe (5/27, 18.5%), and North America Caribbean (2/7, 28.6%), South American nations (2/6, 33.3%).

In terms of first-contact access to geriatric/gerontological physiotherapists, the rates were similar across regions: Africa (6/11, 54.5%), Asia Western Pacific (8/16, 50.0%), Europe (15/27, 55.6%), North America Caribbean (3/7, 42.9%), and South America (4/6, 66.7%). The Physiotherapy Practice Act in some countries incorporated affirmative languages governing geriatric/gerontological practice, with 2/11 (18.2%) of African, 5/16 (31.3%) of Asia Western Pacific, 13/27 (48.1%) of European, 1/7 (14.3%) of North American and Caribbean nations, and 3/6 (50%) of South American having such regulations. Lastly, health insurance coverage for geriatric/gerontological physiotherapy care was reported in 6/11 (54.5%) of Africa, 8/16 (50.0%) of Asia Western Pacific, 10/27 (37.0%) of Europe, 4/7 (57.1%) of North America Caribbean, and 2/6 (33.3%) of South America WP regions. Supplementary file 2 summarises the data on service delivery and policy and organisation among the 67 WPMNs.

Geriatric/gerontological physiotherapy services

Figure 3 shows the relationship between HDI, life expectancy, older-adult-physiotherapist ratio, and percentage availability of GPTS in public hospitals across the five WP regions. Overall, Europe and North America/Caribbean regions with smaller bubbles located at the upper left quadrant of the chart had a higher HDI, life expectancy, GPTS availability, and lesser older adult-physiotherapist ratio. On the other hand, the African region with larger red bubbles located at the lower right quadrant of the chart had lower HDI, life expectancy, GPTS availability, and higher older-adult-physiotherapist ratio. Asia Western Pacific and South America regions had large to moderate multicolour bubbles spread from the centre of the chart to the upper left quadrant, showing better HDI, life expectancy, GPTS availability, and older-adults-physiotherapist ratio than African member nations. Supplementary file 3 shows the enlarged individual regional charts.

Bivariate binary logistic regression models (Table 2) showed that member countries with graduate-level GPT academic ($OR=11.67$, 95% $CI=1.37$, 99.29, $p=0.025$) and clinical programmes ($OR=22.50$, 95% $CI=4.39$, 115.37, $p<0.001$), GPT availability in Practice Act ($OR=22.00$, 95% $CI=4.52$, 107.17, $p<0.001$), national GPT special interest group ($OR=21.94$, 95% $CI=5.89$, 81.75, $p<0.001$), regional GPT special interest group ($OR=6.36$, 95% $CI=1.26$, 32.08, $p=0.025$), lower older-adults to physiotherapists population ratio ($OR=0.99$, 95% $CI=0.99$, 0.99, $p=0.001$), and a higher cost of one GPT session ($OR=1.07$, 95% $CI=1.03$, 1.10, $p<0.001$), geriatric physiotherapists entry-level monthly salary ($OR=1.00$, 95% $CI=1.00$, 1.00, $p<0.001$), life expectancy ($OR=1.26$, 95% $CI=1.12$, 1.41, $p<0.001$), HDI ($OR=1.06e+08$, 95% $CI=5.84e+04$, $3.70e+12$, $p<0.001$), and GNI per capita ($OR=1.00$, 95% $CI=1.00$, 1.00, $p=0.001$) had significantly higher odds of offering GPTS in public hospitals. The model fit indices (χ^2), total variances explained in the GPTS availability (Nagelkerke R^2), and the overall classification success was presented in Table 2.

A multivariate binary logistic regression analysis was conducted using a forward Wald stepwise entry approach to identify the key factors from Table 2 that significantly predicted the availability of GPTS. Due to high multicollinearity among the socioeconomic factors, only HDI was included in the multivariate model. Table 3 shows that three significant factors remained in the model at the third step. Graduate-level GPT academic programme ($OR=33.47$, 95% $CI=1.36$, 822.39, $p=0.032$), GPT Availability in Practice Act ($OR=41.93$, 95% $CI=1.66$, 1059.78, $p=0.023$), and higher HDI ($OR=5.32e+07$, 95% $CI=49.78$, $5.67e+12$, $p=0.003$) were significant predictors and accounted for a 78% variance in GPTS availability. The model was robust: $\chi^2(3)=47.76$, $p<0.001$, Nagelkerke $R^2=0.78$, with an overall classification success rate of 90.7%.

Discussion

Exploring the current state of GPT educational programmes and clinical practices across WPMNs, as well as factors that influence the availability of GPTS, is timely given the emerging ageing population, especially in Africa, Asia, and South America [4, 5], and the WHO's Decade of Healthy Ageing and ICOPE initiatives [24, 25]. The integration of geriatric physiotherapy content in academic programmes, availability of the services in the public healthcare systems, involvement of physiotherapists in geriatric interdisciplinary teams, and the level of insurance coverage of GPTS differ across the WPMNs. These differences highlighted notable disparities in the development and access to GPTS across World Physiotherapy regions and socioeconomic contexts. Access to person-centred healthcare is vital for older adults, with

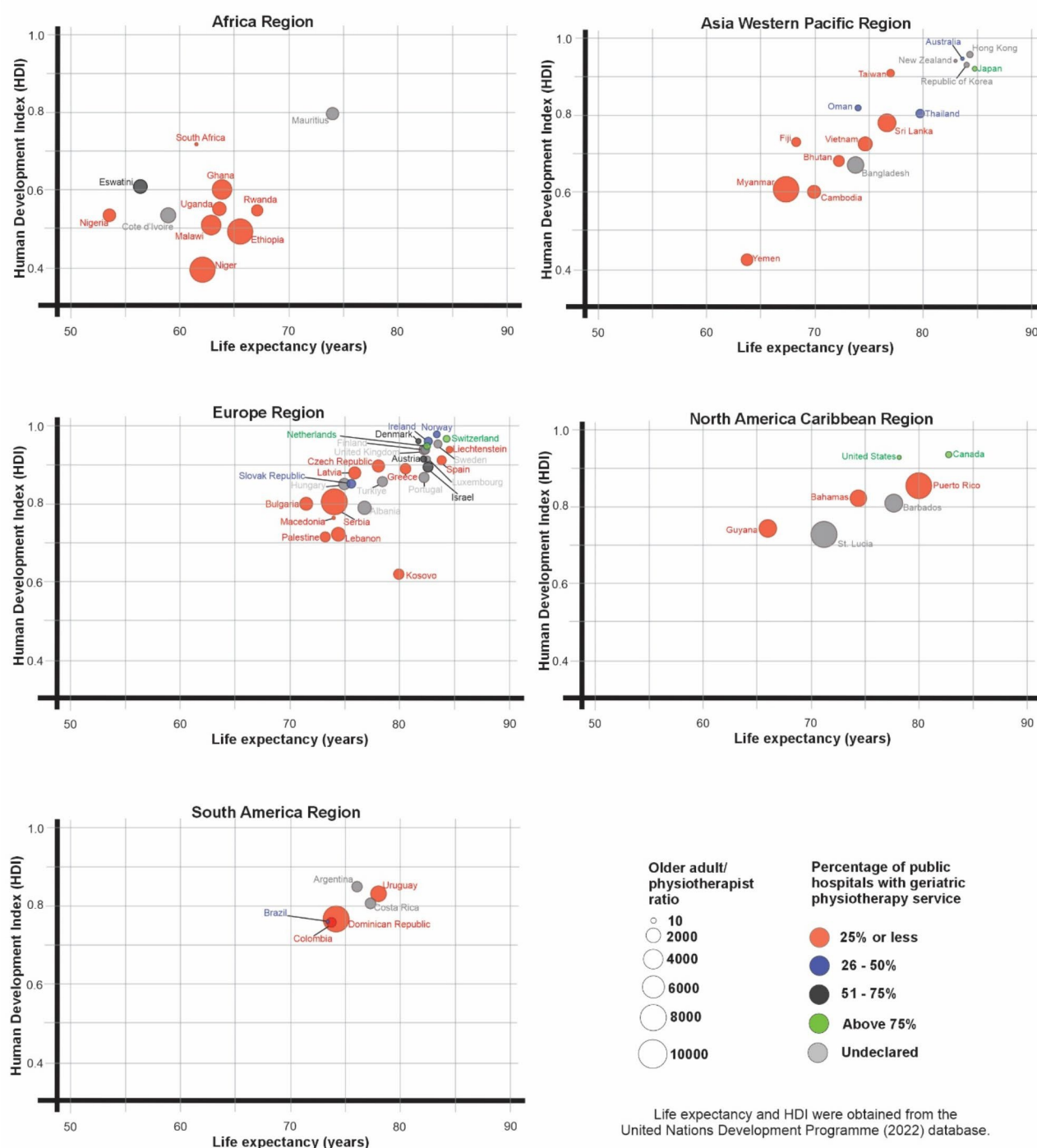


Fig. 3 Geriatric physiotherapy availability in public hospitals and its relationship with HDI, life expectancy, and older adults/physiotherapist ratio across WPMNs and regions

the WHO advocating for health systems that cater to their unique needs, focusing on preventative and long-term care rather than episodic treatments [24].

Geriatric and gerontological physiotherapy are often used interchangeably to describe physiotherapy specialised care for older adults. This overlapping terminology

may explain why the subspecialty group at the World Physiotherapy Congress adopted “Physiotherapist Working with Older People” [31] as their preferred term for physiotherapists interested in this field. A geriatric physiotherapist— a board-certified physiotherapist providing specialist care to older adults, has a well-established

Table 2 Bivariate binary logistic regression showing predictors of geriatric physiotherapy availability in public hospitals in some WPMNs

Variable	Model χ^2	Nagelkerke R^2	Odds Ratio	95% CI	p-value	Overall CS (%)
Educational programme and training						
GPT content in entry-level curriculum	0.46	0.01	0.70	0.25, 2.00	0.498	54.2
Entry-level GPT-focused clinical placement or internship	0.16	0.01	1.30	0.36, 4.68	0.688	68.8
GPT content in the graduate academic programme	8.28†	0.22	11.67	1.37, 99.29	0.025*	68.8
GPT graduate clinical specialisation/residency	21.35†	0.43	22.50	4.39, 115.37	< 0.001*	72.2
Physiotherapy practice factor						
GPT availability in Practice Act	23.71	0.40	22.00	4.52, 107.17	< 0.001*	75.8
GPT direct access/first contact status	1.38	0.03	1.80	0.67, 4.79	0.242	57.6
Cost of one GPT session	33.17†	0.52	1.07	1.03, 1.10	< 0.001*	79.1
Geriatric physiotherapists' entry-level monthly salary	24.66†	0.41	1.00	1.00, 1.00	< 0.001*	82.1
Health insurance coverage of GPT services	1.45	0.03	1.90	0.66, 5.46	0.232	57.9
Availability of national GPT special interest group	28.78	0.48	21.94	5.89, 81.75	< 0.001*	81.5
GPT regional (continent) special interest group	6.48†	0.13	6.36	1.26, 32.08	0.025*	61.3
Older-adults-physiotherapists population ratio	30.64†	0.49	0.99	0.99, 0.99	0.001*	79.1
Socioeconomic factors						
Life expectancy	27.22†	0.45	1.26	1.12, 1.41	< 0.001*	80.6
Human Development Index	45.55†	0.63	1.06e + 08	5.84e + 04, 3.70e + 12	< 0.001*	86.6
Gross National Income per Capita	40.02†	0.62	1.00	1.00, 1.00	0.001*	79.7

† = χ^2 was significant at $p < 0.05$. * = Odds Ratio was significant at $p < 0.05$. CS = classification success. GPT = Geriatric/gerontological Physiotherapy

Table 3 Multivariate binary logistic regression showing predictors of geriatric/gerontological physiotherapy availability in public hospitals in some WPMN

Variable	Odds Ratio	95% CI	p-value
GPT content in the graduate academic programme	33.47	1.36, 822.39	0.032*
GPT Availability in Practice Act	41.93	1.66, 1059.78	0.023*
Human Development Index	5.32e + 07	49.78, 5.67e + 12	0.003*
Constant	0.00	-	0.002*

* = Odds Ratio was significant at $p < 0.05$

process of attainment in certain countries, such as the USA [13,14]. The concept of a gerontological physiotherapist varies significantly across countries and is frequently perceived as primarily academic, as noted from our study findings. Some respondents view gerontological physiotherapists as holding an academic qualification rather than being recognised as a clinical program or specialist. Consequently, we define a gerontological physiotherapist as “a physiotherapist with an advanced degree in gerontology who may or may not hold board certification yet possesses specialised knowledge of the ageing process and the various sociocultural, economic, geographical, psychological, and biological factors that influence ageing.” Therefore, in regions without formal geriatric certification, promoting the role of gerontological physiotherapists could provide a foundation for advancing education and expertise in ageing-related issues.

A key finding of this study is the limited integration of geriatric/gerontological content in physiotherapy academic and clinical programmes, especially at the graduate levels, and the paucity of a specialisation programme in this area. This limitation implies a reduced number of

specialists in GPT, as well as limited geriatric skills and competencies among postgraduate physiotherapists, potentially impacting their practice quality and ability to deliver evidence-based geriatric care [32]. Another study discussed the benefits of introducing standalone courses in competence-desiring areas, beginning with the entry-level physiotherapy curriculum [33]. The present study found that regions and countries with GPT Practice Act and graduate-level academic or clinical residency programmes are more likely to offer GPTS in public hospitals. This highlights the importance of regulation and advanced clinical and academic training in providing specialised care for older adults. Improving the global geriatric physiotherapy capacity aligns with the WHO's ICOPE initiative [25].

Establishing guidelines and best practices for physiotherapy ensures that high-quality care is tailored to the needs of older adults while also setting educational standards for practitioners [17]. The intentional exposure of students to geriatric content at pre-clinical and clinical levels increases their knowledge and, consequently, their interest in specialising as geriatric physiotherapists [34, 35]. This exposure ensures they have role models to

emulate, fostering mentorship and professional development [35]. In turn, this has the potential to address workforce shortages and expand the availability of geriatric services in public healthcare institutions. Including geriatric and gerontological content in physiotherapy education programs at all levels—entry-level, graduate, or postgraduate—in academic or clinical settings provides students with the foundational skills and confidence to engage with older adult populations, regardless of whether they go on to specialise in the care of older people [36]. Thus, integrating geriatric-focused training among WPMNs will be critical in enhancing the quality of care for older adults and meeting the growing demands of geriatric and gerontological physiotherapy globally.

Economic factors such as HDI and insurance coverage of physiotherapy services were also associated with the availability of GPTS in public health institutions. Carvalho et al. [37] identified limited insurance coverage as a major barrier to physiotherapy and rehabilitation services, as it substantially increases out-of-pocket costs for patients. In regions like Africa, where the older-adult-to-physiotherapist ratio is significantly higher, the combination of low HDI and limited insurance coverage [38] creates a double burden. This is consistent with findings by Hu et al. [39], who showed that the lack of a comprehensive insurance system and limited funding affect individual patients and the entire healthcare system as it often results in the underutilisation of healthcare [39]. On the other hand, countries with higher HDI, like those in Europe and North America, have more favourable ratios, better GPTS availability, and broader insurance coverage, which are ideal conditions for the delivery of quality care for older adults [37]. To increase the availability and utilisation of geriatric physiotherapy, particularly in Africa, Asia Western Pacific, and South America, there is a need for new approaches to financing, organising, and delivering healthcare services, particularly for the growing population of older adults [40]. This might require international collaborations, knowledge mobilisation and resource redistribution, as acknowledged in the WHO's Decade of Healthy Ageing report [24]. Moreover, increasing investments in physiotherapy education and funding of physiotherapy services by the public and private sectors could improve access to GPTS.

The practice of geriatric physiotherapy was organised differently across various regions of the world. Concurring with the ICOPE recommendations [25], this study highlighted the critical role of physiotherapy in geriatric interdisciplinary care collaboration. While physiotherapists were identified as important members of geriatric teams in most WPMNs, they are less frequently recognised as leaders, particularly in Africa and South America. This limited leadership opportunity may reflect

broader systemic issues as this study also showed that in regions where physiotherapists were less likely to hold leadership positions in interdisciplinary healthcare teams, there is often a corresponding lack of formal recognition of geriatric physiotherapy in national Physiotherapy Practice Acts, as well as fewer opportunities for advanced training. These barriers limit the development of geriatric and gerontological specialities and reduce the ability of physiotherapists to advocate for and lead improvements in care delivery for older adults.

Limitations

While there are several strengths, including its global scope offering a comprehensive overview of the readiness of physiotherapy programmes for the emerging ageing population, this study is not without limitation. The 48.4% response rate, while reasonable, introduces selection bias and limits the generalisability of the findings, particularly in underrepresented regions, such as North America/Caribbean and South America. Though the data was from official sources, relying on self-reported data may also introduce reporting bias, as respondents could overestimate or underestimate facts for personal or organisational advocacy. Furthermore, the focus on national-level data may overlook regional variations within countries, as administrative statistics may not exist, and respondents rely on anecdotal knowledge of the situation. Regional data may differ significantly from national aggregates in nations with autonomous states or provinces. Relying on national-level data may lead to over-generalisation. Finally, the study's cross-sectional design prevents an assessment of how GPTS has evolved over time, limiting the ability to detect trends or changes.

Conclusion

This study highlights significant gaps in the availability of GPTS and academic programmes across WPMNs. Despite the growing global need for geriatric care, only a minority of countries offer structured geriatric content in entry-level and graduate physiotherapy programmes. Furthermore, clinical residency programmes for geriatric physiotherapy and affirmative clauses in Practice Acts remain scarce, especially in low and middle-income countries. We found more GPTS availability in countries with graduate-level geriatric academic programmes, GPT Availability in Practice Act, and higher HDI. This suggests that socioeconomic factors, regulation, and the presence of specialised education significantly impact the development and accessibility of geriatric services.

Addressing the global shortfall in geriatric physiotherapy through targeted policy interventions, investment in specialised training, and increased international collaboration is crucial for meeting the expected outcomes of global initiatives such as the WHO's integrated care

for older people. The insights from this study can support advocacy for GPTS in regions where it is under-represented, promote advancements in research and innovation, and foster interprofessional collaborations to enhance the quality and accessibility of geriatric and gerontological physiotherapy services.

Abbreviations

GNI	Gross national income
GPT	Geriatric/gerontological Physiotherapy
GPTS	Geriatric physiotherapy services
HDI	Human development index
ICOPE	Integrated care for older people
OR	Odds ratio
WHO	World health organization
WP	World physiotherapy
WPMNs	World physiotherapy member nations

Supplementary Information

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Supplementary Material 1

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Author contributions

OKO and MEK contributed to the conception of this study. OKO, CJA, ACO, ME, and MEK made substantial contributions to the design. OKO, CJA, SS, and MEK participated in data acquisition. OKO, CJA, ACO and SS performed the statistical analysis. OKO, CJA, ACO, ME, SS, and MEK drafted the article. OKO, CJA, ACO, ME, SS, and MEK contributed to its critical revision. All authors approved the final manuscript for publication and agreed to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Data availability

The data supporting this study's findings can be found in Supplementary File 2. Disaggregate microdata are available from the corresponding author upon reasonable request. The data are located in controlled access storage at the School of Kinesiology and Health Sciences, Faculty of Health, York University, Toronto, Ontario, Canada.

Declarations

Ethics approval and consent to participate

York University Research Ethics Board granted us an ethical waiver, citing that the survey questions are informative rather than opinionated. The study's objectives, procedures, and benefits were clearly explained to the representatives of each participating WP member nation. Each representative signed a written informed consent before participating in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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