Physiotherapy in Belize I. A Descriptive Analysis of the Belize Physiotherapy Workforce

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Abstract
The purpose of this study is to describe the current Physiotherapy workforce accessible to the public. Although small, the 2020 cohort of physiotherapists in Belize brings great diversity in ethnicity and training. Collectively, few are educated at the masters or doctorate level, but most have many years of clinical experience and additional education and training. While 16 consider physiotherapy their primary occupation, fewer than half are formally licensed by the Belize Ministry of Health to practice. They are entrepreneurial and active in direct patient care, typically working Monday through Friday in private outpatient and home health settings within the densely populated regions of Belize. Most physiotherapists in Belize believe more awareness and governmental investment is needed so that more people can have access to physiotherapy services for the betterment of society.

Key Words
Physiotherapy, human resources, rehabilitation

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■ INTRODUCTION

Within the Caribbean, 1.3 million people live with some type of disability and around 250,000 persons have a significant disability.(1) While some believe these numbers to be conservative, most agree that they will rise over the coming decades due to an aging population and the epidemiologic transition to a higher incidence of chronic, non-communicable diseases.(2) A global estimate of the need for rehabilitation demonstrated at least one in every three people in the world needs rehabilitation at some point in their course of illness or injury.(3) At present, the need for rehabilitation services around the world is largely unmet with less than 10 skilled rehabilitation practitioners per 1 million population.(4–6)

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In 2017, the World Health Organization (WHO) convened a meeting of over 200 rehabilitation experts from 46 different countries to discuss the state of rehabilitation in the world. This meeting highlighted the global unmet need for rehabilitation and called for coordinated action and commitment amongst all stakeholders to raise the profile of rehabilitation as a health strategy by 2030. This "Rehabilitation 2030" call set forth several key actions, one of which was ensuring a high-quality rehabilitation workforce and services around the world.(7)

Investing in a rehabilitation workforce requires complex human resource planning and a thorough understanding of one's current workforce and needs.(8,9) Even if rehabilitation professionals are available, the supply is often unevenly distributed across global regions, countries, and subregions within countries, even within high-income countries.(10) Before setting targets for optimal numbers of rehabilitation professionals, it is important to establish a complete count and description of the workforce.(11,12)

Belize is a small Caribbean country (population 408,487), located on the northeastern coast of Central America.(13) In 2000–2001, the Belize government dismantled the Ministry of Human Development's Disability Services

Division which had been responsible for developing and monitoring programs and services for people living with disabilities. The International Disability Rights Monitor's regional report of the Americas in 2004 concluded that Belize was one of the least inclusive nations in the Americas with regard to disability and lacked the basic elements necessary for the social inclusion of people with disabilities. While progress has been made since 2004, including the signing and ratification of the United Nation's Convention on the Rights of Persons with Disabilities in 2011,(14) there is still no uniform definition or classification of disability in Belize,(15) and high-quality statistics related to disability and rehabilitation-specific human resources are lacking. (16) Belize's 2017 Voluntary National Review of the Sustainable Development Goals (SDG) by the United Nations (UN) identifies a serious shortage of certain specialties such as physiotherapists, which severely restricts the quality and quantity of services being provided.(17) To what extent is unknown.

The purpose of this study is to describe the Belize physiotherapy workforce accessible to the public during the first quarter of 2020 with regards to prevalence, demographics, education and training, and practice patterns.

■ METHODS

Institutional oversight

This study was performed as part of the United States Fulbright Scholar program(18) with support of the United States Embassy in Belize and at the invitation and approval of the University of Belize. The study was formally reviewed by the University of Wisconsin School of Medicine and the Health Sciences Institutional Review Board of Public Health on November 27, 2019 and deemed exempt (ID 2019-1412).

Participants

All persons licensed by the Belize Ministry of Health (MoH) to practice physiotherapy or who advertise as practicing physiotherapy in Belize were invited to participate in a formal interview for data collection purposes. Physiotherapists currently practicing in the Belize military and not with civilian patients were excluded because they did not represent the cohort of physiotherapists accessible to the community-at-large.

Design and instrumentation

A mixed-methods, phenomenological, in-depth interview methodology was used for this study. A topic guide was used to frame the interview and address the following: (1) current workforce supply; (2) individual demographic information; (3) educational and training background; and (4) practice history and current operations. Data were entered into an Excel spreadsheet (v.16.35), and frequencies for nominal and categorical data were calculated.

Procedures

The goal was to identify all people practicing physiotherapy in Belize. Participants were identified through a formally requested list granted by the MoH's Licensing and Accreditation Unit, word-of-mouth, and an extensive internet and social media search. Once identified, the potential participant was contacted by the most convenient means (email, phone/WhatsApp, Facebook, LinkedIn). Once contacted and screened to verify formal training in physiotherapy, an in-person meeting at the site of practice was requested at which time formal consent for participation was collected. If an in-person interview at the participant's place of employment was not feasible, the next most convenient means was accommodated. Conversations were not recorded but notes were taken, and data was immediately organized after the interview by the primary investigator. Interviews typically lasted 1–2 hours and some required follow-up conversations for data confirmation and clarification.

■ RESULTS

In total, 23 persons were contacted and screened for participation. Four were military personnel and one did not have formal training; thus, they were excluded from participation. A total of 18 met inclusion criteria and agreed to participate.

Workforce supply

Of these participants, seven (39%) were actively licensed to practice physiotherapy by the MoH's Licensing and Accreditation Unit. Of the seven licensed physiotherapists, two did not practice physiotherapy as their primary occupation and another was a foreign national hired on a temporary contract set to expire within the next six months. The remaining four licensed physiotherapists were practicing physiotherapy as their primary occupation and were considered permanent residents of Belize. Eleven additional participants had all gone through formal physiotherapy training, and all but one graduated with formal certificate, diploma, or degree recognition. One of these physiotherapists was a foreign national and working on a contract set to expire within three months.

Demographics

Participants represented six different countries. Ten were natives of Belize, three were from the United States of America (USA), two from Cuba and one each from Guatemala, Switzerland, and Taiwan (Figure 1). Eleven

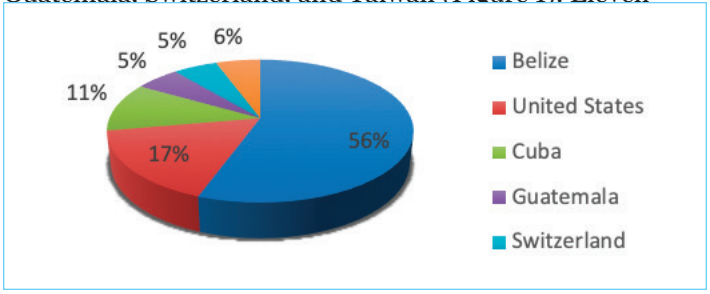

Figure 1. Nationalities

women were represented making up 61% of the workforce. Participants were based in five of the six districts of Belize. The Corozal district had no permanent physiotherapists, Toledo had one, and both Stann Creek and Orange Walk had two. The remaining 13 were located in the most

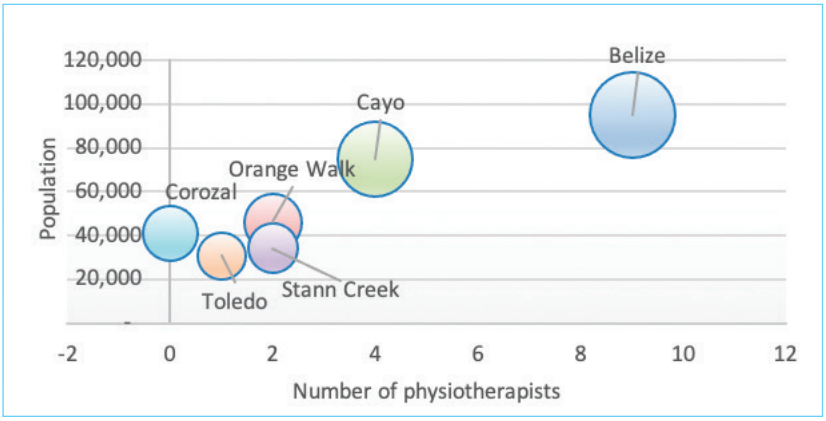

Figure 2. Physiotherapists per district

populated Cayo and Belize districts (Figure 2).

Education and Training

Of the 18 participants, six studied in the USA (33%), five in Guatemala (28%), two in both Cuba (11%) and Mexico (11%), and one each in Germany (6%), Jamaica (6%), and Taiwan (6%). Seventeen of the eighteen participants (94%) finished formal physiotherapy training programs before practicing in Belize. Recognition ranged from five (29%) certificate/diplomas, eight (47%) bachelor's degrees, one (6%) master's degree, and three (18%) doctorate degrees. In addition to physiotherapy training, nine participants (53%)

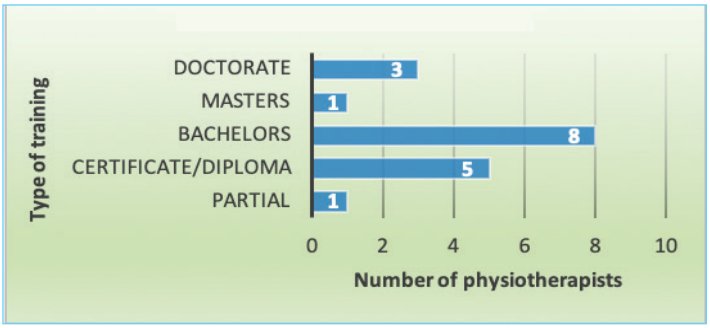

Figure 3. Physiotherapy training

ADDITIONAL TRAINING AND DEGREES

- Nursing
- Alternative medicine
- Master's in Public Health
- Respitatory Therapy
- Medical Technology
- Emergency Medical Technician (EMT)
- Masters of Adult Education and Community Development
- Masters of Biomechanic and Kinesiology
- Chiropractic

had additional degrees and 10 (56%) had additional training certificates in very diverse areas (Figure 3).

Practice Patterns

The participants' professional experience ranged from 1–43 years of physiotherapy practice, with 17 years of practice on average. Seven (41%) participants had been practicing 1–10 years, five (28%) 11–20 years, and six (33%) for 21 years or more (Figure 4).

There are seven private outpatient physiotherapy clinics throughout Belize located in Belize City, Belmopan, San Ignacio, Orange Walk, and Dangriga. Only one of these clinics employs more than one physiotherapist. There is one public and three private medical facilities providing physiotherapy services located in Belize City. There are two non-governmental organizations (NGO) providing full-time physiotherapy services and community-based rehabilitation in Belize City and Punta Gorda. One private physiotherapy clinic offers pro bono pediatric services in Belmopan.

Of the 16 participants who work as physiotherapists as primary occupation, their primary practice settings are as follows: seven (44%) work in private, physiotherapist-owned, outpatient clinics as their primary physiotherapy job; four (25%) work in NGO/pro bono

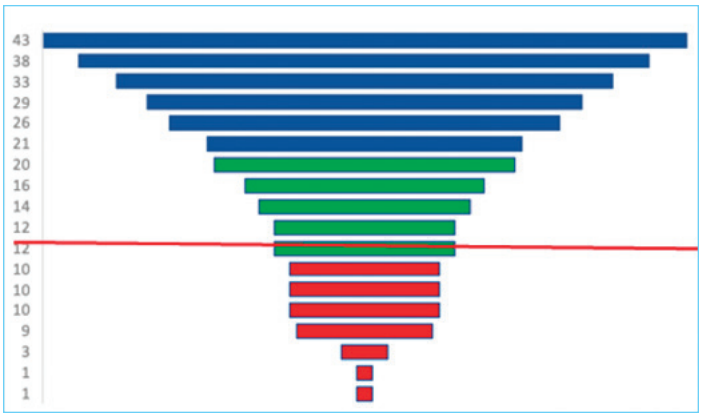

Figure 4. Years of experience

outpatient settings; two (13%) work in private medical outpatient settings; two (13%) work in a public hospital; and one (6%) works in home health. Only one of these 16 physiotherapists (6%) claims the inpatient setting as their primary practice setting. Ten (56%) of the participants provide physiotherapy in more than one setting, often as another source of income. The most prevalent setting for secondary jobs is home health (Table 1).

One participant (6%) only receives clients from physician referral. All others (94%) receive clients from both physician and self-referral. Additionally, seven (39%) participants see patients referred by Social Security. As a cohort, these physiotherapists are seeing approximately 356–460 visits/week or 71–92 patients/day, Monday through Friday. This equates to 4–6 patients per therapist per day when all 16 physiotherapists are working full-time

Table 1. Primary settings of employment

	Population	Physiotherapists	Private outpatients physioclinics	Private medical facilities providing physiotherapy	Non-Governmental organizations providing physiotherapy	Public Hospitals providing physiotherapy	Home Health physiotherapy
Country	408,487	16	6	3	3	1	0
Belize	124,096	8	1	3	2	1	0
Cayo	99,118	4	3	0	0	0	0
Orange Walk	52,550	2	1	0	0	0	1
Corozal	49,446	0	0	0	0	0	0
Stann Creek	44,720	1	1	0	0	0	0
Toledo	38,557	1	0	0	1	0	0

Table 1. Primary settings of employment

Monday through Friday. On average, nine patients are seen throughout the country on Saturday and none on Sunday. Cost per session varies across practice settings. In private physiotherapy clinics, the cost per session ranges from $40 Belize dollars (BZD)–$100 BZD with an average of $69 BZD ($2 BZD = $1USD). In private medical outpatient settings, a physiotherapy session costs as high as $120 BZD –$150 BZD while in public hospitals, a session costs $20 BZD–$30 BZD. Social security pays on average $30–$40 BZD per session.

■ DISCUSSION

WORKFORCE SUPPLY

While the optimal number of formally trained physiotherapists needed for meeting the needs of the country is not known, it is reasonable to speculate that 0.44 physiotherapists per 10,000 people is inadequate. Within the region, St. Lucia's population (178,696) is less than half of that of Belize, yet this island nation has almost the same number of physiotherapists.(19) In addition, Bermuda, with a population of 63,968, has 54 physiotherapists (8.5 per 10,000 people).(20) As compared to the prevalence of other healthcare professions in Belize, physiotherapy is significantly lacking. Belize has 412 medical doctors (10.4 per 10,000 people) and 797 registered nurses (20 per 10,000 people).(13) These findings echo the country's 2014–2024 National Health Sector Strategic Plan that acknowledges a serious shortage of physiotherapists which severely restricts the quality and quantity of services being provided.(21) This acknowledgement is important but the plan neglects to offer any direct goals or objectives for how to increase the physiotherapy or other rehabilitation workforces in Belize.

In attempting to address human resource deficits in health care, Belize has a history of establishing bilateral agreements with countries such as Cuba and Nigeria, which include the use of medical brigades to reach remote areas.(22) The Belize Strategic Plan on Human Resources for Universal Health 2019–2024 acknowledges the challenges associated with this practice and recognizes that it is not sustainable long-term. Another approach has been through the provision of scholarships for students to study abroad. While this has been successful in bolstering the workforce of various professions in the country, the government has only recently taken this approach for physiotherapy by funding two students to study physiotherapy in Canada and Taiwan.(23) Finally, it is not unusual to see short-term expatriates, students, or volunteer medical professionals and groups working in various regions of Belize.(24) This type of practice, usually well intended, comes with inherent risks, especially when working in vulnerable populations.(25–28) There is often a flawed assumption that these programs are relatively innocuous and provide mutual benefit.(29,31) Research has shown these programs have the potential to reinforce negative attitudes, disrupt community relations and dynamics, and provide inappropriate or poor-quality care or harm.(32,33)

Task shifting specific to rehabilitation has been successful in many under-resourced communities around the world where various tasks could be intertwined with those of other associated professions such as occupational therapists, speech therapists, physiatrists, technicians, and aides.(11,34,35) In Belize, however, there are no practicing occupational therapists (OT) or licensed physiatrists,(24) and speech therapy is in its infancy.(36) Similarly, only one physical therapy aide is licensed in the entire country and two NGOs use rehabilitation technicians and field officers trained internally. Task shifting specific to rehabilitation is not feasible with the current state of human resources in Belize.

The results of this study suggest an inadequate workforce of

physiotherapists when functioning in the traditional, restorative model within the health care system. This deficit is even more pronounced when rehabilitation is considered within the context of a broader definition proposed by the WHO: "a set of interventions needed when a person is experiencing or is likely to experience limitations in everyday functioning due to ageing or a health condition, including chronic diseases or disorders, injuries or traumas. (24) This perspective highlights the need to utilize physiotherapists not only in a restorative manner but also in prevention, wellness, and health maintenance initiatives to better address highly prevalent and costly areas such as non-communicable diseases, communicable diseases, fall prevention, mental health, women's health, emergency medicine, and even disaster preparedness and response. (2,3,37) This would require a much larger workforce and investment, but evidence shows the return could be worthwhile.(38–41)

Demographics

Diversity is one of Belize's most salient characteristics,(42) and is reflected in its physiotherapy workforce. In addition to notable ethnic diversity among physiotherapists, there is a more equitable distribution of men and women practicing physiotherapy compared to the rest of Latin America and the Caribbean region.(43) According to a 2004 Institute of Medicine report, these findings should be viewed as a strength because increasing diversity among health care professionals is associated with improved access to care for ethnic/racial minorities, greater patient choice and satisfaction, better patient-clinician communication, and improved educational experiences for allied health students.(44)

While lauding the diversity of the Belize physiotherapy workforce, one must acknowledge that the geographic distribution is inequitable; approximately three quarters of the full-time physiotherapists serve in districts which account for only half the country's population. This is understandable given the dominance of privately owned physiotherapy clinics and practices, but leaves places like the Corozal district (population 49,446) and San Pedro Town (population 20,542) without local access.(13) A two-hour or more drive or boat ride to Belize City or the Cayo District to see a physiotherapist is a daunting if not impossible task for someone with pain, functional difficulty, or lack of resources. Some physiotherapists travel out of their districts to underserved communities on an ad hoc basis, but this practice is neither reliable nor sustainable.

Education and training

For many countries around the world, doctoral training in physiotherapy is increasingly the norm with a Doctor of Physiotherapy (DPT) becoming the entry-level degree of choice. This clinical doctorate allows physiotherapy practitioners to operate autonomously and receive patients without a referral, while additionally strengthening the local health care system by enlarging the medical safety net within communities. Belize has few doctoral-trained physiotherapists, and, as with occupational and speech therapies, the country does not have a physiotherapy education program. While there is recognition of the need for such a program, there are no plans at the local universities to establish any in the near future. As a result, one must leave the country to study and train, something that is a burden for many and impossible for most.

The current cohort trained in six different countries, and all but one finished with recognition ranging from a certificate/diploma to a clinical doctorate in physiotherapy. With heterogeneity in training comes diversity in knowledge and skills as well as approaches to physiotherapy treatment. This could be viewed as a strength, but given that standards for licensure are still evolving in Belize and resources for oversight and quality management throughout the country are limited,(24) there is the risk of outdated approaches and limited scope of practice. Fortunately, the current cohort of physiotherapists, while small in number, collectively has a lot of experience and has frequently pursued additional training (Figure 3).

A large part of the present cohort will likely retire or return back to their native countries within the next 10–15 years, so the future of the profession in Belize is bleak unless current barriers to education and training are addressed. Precedence for government-supported professional development already exists in Belize with successful initiatives including the development of the nurse anesthetists profession in collaboration with Health Volunteers Overseas(45); the Accident and Emergency Department in collaboration with the Medical College of Wisconsin(46); and the pharmacy profession. With the ongoing efforts to develop a new medical school within the University of Belize, there is a potential model for other health professional programs including physiotherapy. Outside of the box thinking is needed, especially given the current COVID-19 challenges; and ideas such as an accredited hybrid physiotherapy program that combines didactic online content and practical experience with the current qualified physiotherapists in the country need to be explored. In developing programming, financial concerns for both the institution and student need to be carefully weighed.(47)

Practice patterns and access

The average daily workload revealed in this study demonstrates an underutilization of physiotherapists. While it may reflect a high prevalence of physiotherapists working in home health and in various non-clinical capacities, it is more likely a reflection of the cost of physiotherapy services. The cost, as identified in this study, is a significant barrier for many. With the government of Belize only subsidizing physiotherapy services through social security and at the Karl Heusner Memorial Hospital in Belize City, the vast majority of sessions are self-pay and

cost more than twice as much as a government subsidized visit.

To improve access and better utilize the physiotherapy workforce, in addition to the private sector, a public workforce of physiotherapists needs to be considered. If physiotherapists were placed in the three regional hospitals, three community hospitals, and 11 polyclinics, this would significantly improve the profession's reach to all areas of the country.(22) With 55% of the population living in rural areas(13), there may also be a need to assign or rotate physiotherapists to health centers and posts that serve hard-to-reach communities in Belize.

This kind of investment by the government sounds daunting, but if physiotherapists are utilized in an expanded role as envisioned by WHO, it is feasible for physiotherapists to see 6-8 patients per day, easily covering the average physiotherapist salary.(48) In addition, savings to the health system and increased economic gain could be seen through improved post-surgical outcomes,(49) reduced long-term disability and morbidity in acute care patients,(50) and improved function and return to work after various orthopedic and neurological injuries, including highly prevalent transport accidents and interpersonal violence, as well as following amputation procedures due to complications of diabetes and atherosclerosis.(21,51) Furthermore, while child mortality rates are declining, not all who survive actually thrive. Early interventions to optimize developmental outcomes for children with various health conditions and injuries, can positively affect participation rates in education, community activities, and future capacity to work.(52,53)

Finally, a community-based rehabilitation (CBR) approach out of governmental-owned facilities could be used in the more rural areas of Belize.(54,55) Community-based rehabilitation is a multisectoral approach that strives to improve the equalization of opportunities for and social inclusion of people with disabilities while combating the perpetual cycle of poverty and disability.(56) By training and deploying rehabilitation field officers (RFOs) and community health workers- models used by two successful NGOs in Belize- the entire country could have greater access to physiotherapy resources and services for a relatively small investment.

■ IMPLICATIONS/NEXT STEPS

The PAHO reports on non-communicable diseases in Belize will continue to rise as leading causes of mortality, emerging viral diseases will continue to pose threats, and the costs of trauma and urban violence will continue to escalate- all of which will continue to burden the health system.(57) There is significant evidence to suggest that physiotherapy, exercise, and regular physical activity have immense benefits for health and should be utilized in the fight against these and other health challenges.(58–60) Greater access to physical therapy and rehabilitation services would help "ensure healthy lives and promote well-being at all ages," a United Nations goal for sustainable development (goal #3).(61)

If Belize is to respond to the "Rehabilitation 2030" call, leaders must resist the reliance on natural change or best guesses for the establishment of the rehabilitation workforce policies.(62) Rather, leaders should address knowledge gaps and seek up-to-date data and information to make informed decisions. This study provides current data to build upon and should be an impetus for change.

The next step is a government-led Systematic Assessment of Rehabilitation Situation (STARS), a tool launched by WHO for countries to utilize in their development of national rehabilitation strategies. This assessment will allow for a thorough understanding of the current strengths and weaknesses of the health systems as they relate to rehabilitation in country.(63) This assessment would help national leaders identify their own priorities and develop a rehabilitation strategic plan. At this time, few countries in the region have national action plans on rehabilitation.(64) Belize can seize the opportunity to become a regional leader in disability and rehabilitation. It would be a commitment and an investment; however, it holds the prospect of not only changing the lives of people living with disability but also society at large.

■ CONCLUSION

This study quantified, characterized, and gave voice to the current physiotherapy workforce in Belize. While the current physiotherapy workforce is dedicated, experienced, and resilient, it is being underutilized and is too small. These results highlight an unmet need for rehabilitation services and represent a failure to fulfill the basic human right to health and wellbeing.(65) In addition, other rehabilitation professions are not represented. It is understood that merely increasing the availability of providers is only the beginning; it will be important to address other social and environmental barriers as highlighted in this study. It is a complex and challenging process but rehabilitation is an investment in human capital that contributes to health, economic and social development.(61) Health equals wealth, and redefining rehabilitation, growing physiotherapy within governmental institutions, and allowing the free market to expand would take the profession to all corners of the country, allow for more creative uses of physiotherapy, enlarge the health care system's safety net, and improve the overall health and wealth of the country with relatively low investment. Belize could prosper and be a leader within the region.

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La fisioterapia en Belice I. Análisis descriptivo de la fuerza laboral de fisioterapia en Belice

Resumen

El propósito de este estudio es describir la actual fuerza laboral de fisioterapia asequible al público. Aunque pequeña, la cohorte de fisioterapeutas de Belice en el 2020 aporta una gran diversidad étnica y de formación. Colectivamente, pocos tienen educación a nivel de maestría o doctorado, pero la mayoría tiene muchos años de experiencia clínica y educación y capacitación adicionales. Si bien 16 consideran la fisioterapia su ocupación principal, menos de la mitad tienen una licencia formal del Ministerio de Salud para ejercer. Son emprendedores y activos en la atención directa al paciente, por lo general trabajan de lunes a viernes en entornos privados de atención ambulatoria y domiciliaria dentro de las regiones densamente pobladas de Belice. La mayoría de los fisioterapeutas en Belice creen que se necesita más conciencia e inversión gubernamental para que más personas puedan tener acceso a los servicios de fisioterapia para el mejoramiento de la sociedad.

Palabras clave

Fisioterapia, recursos humanos, rehabilitación

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Antibiotics linked to increased risk of colon cancer

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There is a clear link between taking antibiotics and an increased risk of developing colon cancer within the next five to ten years, as confirmed by researchers at Umeå University, Sweden, after a study of 40,000 cancer cases. The impact of antibiotics on the intestinal microbiome is thought to lie behind the increased risk of cancer.

While in many cases antibiotic therapy is necessary and saves lives, in the event of less serious ailments, caution should be exercised. Above all to prevent bacteria from developing resistance but, as this study shows, also because antibiotics may increase the risk of future colon cancer, explains Sophia Harlid, cancer researcher.

Both women and men, who took antibiotics for over six months, ran a 17% greater risk of developing cancer in the ascending colon, than those who did not. However, no increased risk was found for cancer in the descending colon. Nor was there an increased risk of rectal cancer in men taking antibiotics, while women taking antibiotics had a slightly reduced incidence of rectal cancer.

The increased risk of colon cancer was visible five to ten years after taking antibiotics. Although it was greatest for those taking more antibiotics, a small, but statistically significant, increase in the risk of cancer was seen after a single course of antibiotics.

This study uses data on 40,000 patients from the Swedish Colorectal Cancer Registry for the 2010–2016 period. These have been compared to a matched control group of 200,000 cancer-free individuals drawn from the Swedish population at large. Data on antibiotic use was collected from the Swedish Prescribed Drug Register for the period 2005–2016. The Swedish study confirms the results of an earlier, somewhat smaller British study.

To understand how antibiotics increase the risk, the researchers studied a non-antibiotic bactericidal drug used for urinary infections that does not affect the microbiome. There was no difference in the frequency of colon cancer in those who used this drug, suggesting that it is the impact of antibiotics on the microbiome that increases the risk of cancer. While only oral antibiotics were studied, even intravenous antibiotics may affect the gut microbiota in the intestinal system.

"There is absolutely no cause for alarm simply because you have taken antibiotics. The increase in risk is moderate and the effect on the absolute risk to the individual is fairly small. Sweden is also in the process of introducing routine screening for colorectal cancer, so that any cancer can be detected early or even prevented, as cancer precursors can sometimes be removed," says Sophia Harlid.

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