Conference Paper

Physiotherapy Services in Bahrain: Are We Ready to Deal with a Disaster?

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Abstract

Background: Mitigating disaster-related disability by medical response is well established, and physiotherapy has been considered in the medium- to long-term care plan of the affected people. **Purpose:** To explore the sufficiency of the physiotherapy services in the Kingdom of Bahrain to meet the demands and needs of the population health and during a disaster, and to examine the relationship between the currently specialized physiotherapists (PTs) and their ability to cope with the cases associated with a disaster. **Methods:** Public data from three different governmental entities were analyzed regarding the population demographics and the number and specialties of the PTs. A market survey was conducted to collect data about the specializations needs. **Results:** There are 1.7 PTs for every 10,000 persons, and only 8% of the licensed PTs are specialized in orthopedics, neurology and pediatrics. About 30% of the PT workforce are non-Bahraini. **Conclusion:** The number of PTs per 10,000 persons in Bahrain is below the world's average, and the current specializations of the licensed PTs may be insufficient to handle the complex cases of a disaster.

Keywords: Physiotherapy, Rehabilitation, Disaster Response, Medical Response, Resilient Health Care

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1. Introduction

Natural disasters defined by the World Health Organization (WHO) as "an occurrence disputing the normal conditions of existence and causing a level of suffering that exceeds the capacity of adjustment of the affected community", can have a significant impact on the wellbeing and health of the people affected by it (WCPT, 2016; WHO, 2002). Mitigating disaster-related disability by emergency response through local and international agencies is well recognized and documented (DREF, 2018). The modern history of physiotherapy is associated with World War II, when there was a sudden increase in the need for rehabilitating the injured soldiers (Eldar & Jelić, 2003; Moore

et al., 2013; Shaik & Shemjaz, 2014). The knowledge of physiotherapists in various areas offer a lot in managing and handling a wide range of acute and chronic conditions, and in the past two decades, physiotherapists emerged as an essential part of the medical response team (Khan, Amatya, Gosney, Rathore, & Burkle, 2015; Rathore et al., 2012; WCPT, 2016). Even though the focus during disaster relief is saving lives and reducing the severity of the injuries, physiotherapy have been considered in the medium to long-term care plan of the people affected with disability or injury following a disaster or war (Moore et al., 2013; NPA, 2015; Reinhardt et al., 2011). However, the available literature discussing the role of physiotherapy in disaster relief is limited.

Health human resources policy and planning have been emerging as an essential aspect of reshaping the health care systems worldwide (Birch et al., 2007; Landry et al., 2016). Since physiotherapy has been internationally identified as a vital medical service during a disaster, war or an emergency, more emphasis should be placed on the readiness of the Middle Eastern countries in facing these tragic events. Therefore, the purpose of this study was to (1) explore the sufficiency of the physiotherapy services in the Kingdom of Bahrain to meet the demands and needs of the population health and during a disaster, and to (2) examine the relationship between the currently specialized physiotherapists (PTs) and their ability to cope with the cases associated with a disaster.

2. Research Methodology

2.1. Dataset sources

Local data sources, which are readily available on the internet through multiple governmental authorities of Bahrain, were retrieved and analyzed. The first dataset containing the statistical information about the demographics, education, and the economy was obtained from the General Directorate of Statistic in the Information & eGovernment Authority (IGA) for 2016 (IGA, 2017). Detailed health-related statistics such as the demographics, human resources of the health sector, and the number of allied health professionals per capita were retrieved from the Ministry of Health (MOH) (MOH, 2016a, 2016b, 2016c, 2016d, 2016e). The second dataset was obtained from the National Health Regulatory Authority (NHRA) website containing information about the licensed PTs for 2016 (NHRA, 2016). The PTs were categorized based on sex (male or female), nationality (Bahraini or non-Bahraini), and sector (Public, private, social services, and higher education). The author's qualitative explanation, based on

their expertise and knowledge of the local health care system and services, were considered as supplementary data when quantitative information was not available (Jesus et al., 2016).

2.2. Survey

A questionnaire was designed explicitly for this study. The questionnaire aimed to collect information about the currently licensed PTs (sex, sector, postgraduate degrees), and future requirements of specialized PTs in various areas including orthopedics, neurology, and cardiopulmonary. A convenient sample of public and private health facilities that offer physiotherapy services were identified through personal contacts and based on the following criteria: (1) They represent major public hospitals, smaller primary care health centers, and private clinics, and (2) their willingness to participate in the survey without the need of formal communication to save time. The heads of these facilities were contacted, and data collection and filling out the questionnaire was achieved via telephone calls and emails after obtaining their consent to participate in the survey.

2.3. Data analysis

Demographical information such as population, sex, healthcare sector, and postgraduate degrees was analyzed. More importantly, the number of physiotherapists per 10,000 persons (or capita) was calculated from the available datasets and surveys. Data are expressed as the number of PTs or percentages in the text and tables. All variables were analyzed using IBM SPSS statistics (v23.0 for Windows; SPSS, Chicago, IL).

3. Results

Based on the information obtained from the IGA and MOH, the population of Bahrain was 1.370 million in 2015 and grew by 4% reaching 1.424 million in 2016 (IGA, 2017; MOH, 2016e). There are 132 physiotherapists, occupational therapists and technicians in the public sector only (MOH, 2016b). The demand on outpatient physiotherapy services in the primary health centers was equivalent to 132,514 visits compared to 48,441 visits in Salmaniya Medical Complex, which is considered the most prominent public hospital in the country (MOH, 2016c, 2016d). Further details about the private sector are not

available. Considering the information provided by the NHRA and the IGA datasets of 2016, the ratio of PTs to 10,000 persons is 1.7 (IGA, 2017; NHRA, 2016).

Analysis of the NHRA's dataset did not provide detailed demographics of the physiotherapists such as the age group, highest academic degree, or area of practice. Due to time shortage, further information could not be retrieved. Table 1 shows the characteristics of the licensed physiotherapists (*n*=245) in Bahrain for 2016. About 69% of the licensed PTs according to the NHRA's dataset of 2016 were females (*n*=170), while the male PTs were about 31% (*n*=75). From a nationality perspective, about 70% of the PTs were Bahraini, and the remaining 30% were non-Bahraini of different nationalities. When the PTs were classified according to the sector, about 49% were working in the public sector (*n*=120), with a similar percentage in the private sector (*n*=119). Less than 2% of the PTs were working in societies or higher-education institutes (Total *n*=6) (Table 1).

Table 1: Characteristics of the Licensed Physiotherapists (2016).

Parameters		**n (%)**
Sex	Males	75 (69%)
	Females	170 (31%)
Nationality	Bahraini	171 (70%)
	Non-Bahraini	74 (30%)
Sector	Public	120 (49%)
	Private	119 (49%)
	Societies	3 (1%)
	Higher-Education	3 (1%)
Total (n)		**245**

Officials from five public hospitals and health centers and seventeen private clinics agreed to participate in the survey, which was completed in February and March 2018. Results of the public sector showed that 95% of the PTs were Bahraini (*n*=126), and 57% were females (*n*=76). On the other hand, the Bahraini PTs (51%, *n*=52) was almost equal to the non-Bahraini PTs (49%, *n*=50) in the private sector. Most of the PTs in the private sector were also females (70%, *n*=71). Overall, the non-Bahraini PTs were 25% of the total PTs currently working in the surveyed facilities (*n*=57) (Table 2).

The respondents from the public hospitals stated that the sector is in need for physiotherapists specialized in neurology (35%, *n*=34), orthopedics (29%, *n*=28), and pediatrics (21%, *n*=21) in the upcoming five to ten years. The remaining specialties including cardiopulmonary, integumentary and women's health formed the remaining 15% (*n*=15). Similarly, the owners of the private sector clinics also indicated a need for physiotherapists specialized in neurology (34%, *n*=20), orthopedics (33%, *n*=19),

pediatrics (26%, *n*=15) and women's health (7%, *n*=4). However, there was no interest in PTs specialized in the integumentary or cardiopulmonary systems (0%, *n*=0) (Table 2).

Table 2: The Characteristics of the Surveyed Physiotherapists and Specializations Needs.

Parameters		**Public Sector n (%)**	**Private sector n (%)**
Sex	Males	57 (43%)	31 (30%)
	Females	76 (57%)	71 (70%)
Nationality	Bahraini	126 (95%)	52 (51%)
	Non-Bahraini	7 (5%)	50 (49%)
Total (n)		**133**	**102**
Specializations Needs	Orthopedics	28 (29%)	19 (33%)
	Neurology	34 (35%)	20 (34%)
	Pediatrics	21 (21%)	15 (26%)
	Cardiopulmonary	12 (12%)	0 (0%)
	Sports	0 (0%)	0 (0%)
	Women's Health	1 (1%)	4 (7%)
	Integumentary	2 (2%)	0 (0%)
Total (n)		**98**	**58**

Further analysis of the data obtained from the licensed PTs in the public and private sectors, supported with the knowledge of the authors, showed that only 8% (*n*=22) of the total licensed PTs hold a postgraduate degree. Most of them hold either a Master's degree only (26%, *n*=6), or combined with a transitional Doctor of Physical Therapy degree (tDPT) (36%, *n*=8), or a Philosophy degree (Ph.D.) (23%, *n*=5). Furthermore, most of them are specialized in orthopedics (54%, *n*=12), followed by neurology (18%, *n*=4) and pediatrics (9%, *n*=2). Cardiopulmonary, sports and women's health collectively formed the remaining 19% (*n*=4) (Table 3).

Table 3: The Postgraduate Degrees of the Licensed Physiotherapists (2016).

Degree	**PTs with PG degrees n (%)**	**Of all licensed PTs (%)**	**Specialization**	**n (%)**
MS only	6 (27%)	2%	Orthopedics	12 (54%)
tDPT only	3 (14%)	1%	Neurology	4 (18%)
PhD only	0 (0%)	0%	Pediatrics	2 (9%)
MS and tDPT	8 (36%)	3%	Cardiopulmonary	1 (5%)
MS and PhD	5 (23%)	2%	Sports	2 (9%)
			Women's Health	1 (5%)
			Integumentary	0 (0%)
Total (n)	**22 (100%)**	**8%**		**22 (100)**

4. Discussion

The present study aimed to investigate if the physiotherapy health care services can meet the demands of the population and if it is resilient to handle the challenges of disasters and emergencies and to explore the data of the currently licensed and specialized physiotherapists in Bahrain.

The constitution of the Kingdom of Bahrain states that every citizen is entitled to health care (IGA, 2002), and the MOH delivers public health care services in Bahrain. On the other hand, privately owned medical establishments support and complete the delivery of these services (MOH, 2018). Like other medical professions, physiotherapy is affected by the demographics and types of medical illnesses of the population (Landry et al., 2016). The increased chronicity of conditions and advancements in the health care system result in an aging population and influences the years lived with disability, which reflects on the needs for more services (Jesus et al., 2016; Vos et al., 2012). The life expectancy of the newborns in Bahrain increased from 76.4 years in 2010 to 77.1 years in 2016. In the same period, the population of Bahrain grew by 19%, reaching 1.424 million persons. If the rapid growth in population continuous at the same pace, it could reach 1.695 million persons by 2021, which will strain the health care system (IGA, 2017). Jesus et al. (2016) compared between physiotherapy demand and supply n four countries. The research group found that Portugal has the highest apparent physiotherapy needs in areas of orthopedic and neurological disorders compared to Bangladesh, Singapore, and the United States. The needs are met with higher physiotherapy supply (7.8 PTs per 10,000 people).

Looking at the number of licensed physiotherapists in Bahrain, there are less than 2 PTs per 10,000 people (NHRA, 2016). Such ratio puts Bahrain far behind the Scandinavian countries (12 to 27 PTs per 10,000 people), Germany (16 PTs per 10,000 people), Australia (11 PTs per 10,000) and the US (6 PTs per 10,000 people). Even though, the status of physiotherapy services supply is still better than other Middle Eastern countries such as KSA (0.88 PTs per 10,000) and Egypt (0.37 PTs per 10,000) (WCPT, 2013). If the average number of 5 PTs per 10,000 persons was considered, the health care system in Bahrain needs a total of 720 PTs to meet the current demands, which results in a shortage of 475 PTs (WCPT, 2013). Assuming 30 new PT graduates will join the market each year, it will take 15 years to meet the current demands without considering the future increase in population and chronicity of conditions. While Physiotherapy and other medical services are regulated by the NHRA (NHRA, 2013), employment in the public sector is monitored and controlled by the Civil Service Burau (CSB) of Bahrain

(CSB, 2015). The job vacancies and employment, including the healthcare sector, are primarily influenced by the need, the state's treasury and finance, which is discussed next.

From an economic point of view, the Gross Domestic Product (GDP) per capita in Bahrain was recorded at 22K USD in 2017, ranked at 175% of the World's average or the 44^{th} position worldwide (Economics, 2017). Germany (48K USD), Australia (56K USD) and the US (53K USD) have higher ratios of PTs per 10,000 people and a higher GDP per capita. Therefore, it can be assumed that higher GDP results in improved health care systems including the availability of physiotherapy staff, infrastructure, and emergency resources to mitigate disasters and crises (Lange & Vollmer, 2017). Considering the significant shortage of PTs in the context of a disaster or an emergency, it can negatively impact the preparedness of the Bahraini public and private health sectors to cope with any sudden increase in health care service needs.

The percentage of non-Bahraini PTs can also have an impact. Belasen and Polachek (2007) stated that disasters such as hurricanes could result in a 4.76% drop in employment. Moreover, a 3.33% decline in wages can also be seen. Increased unemployability and reduced salaries combined with the economic downfall of a disaster will push the non-Bahraini or foreign PTs away from the region. Thus, the increased shortages in staff will place further pressure on and negatively affect the health care system in mitigating disasters.

The World Confederation for Physical Therapy (WCPT) defines physiotherapy specialty as a defined area of physiotherapy practice, in which the physiotherapist obtains advanced knowledge, skills and competence in a specific area (WCPT, 2017). Currently, there are only 22 specialized PTs in Bahrain, which is equivalent to 8% of the licensed PTs. Most of them are specialized in orthopedics, neurology or pediatrics (Table 3). Moreover, the future needs of specialized PTs are also in these three main scopes of practice (Table 2). When compared to the PTs of the province of British Columbia in Canada, 12% of the 425 surveyed PTs hold postgraduate degrees with similar specializations, and the interests of those who would like to pursue a postgraduate degree are also in the same fields (Sran & Murphy, 2009).

The severe injuries seen in disasters such as earthquakes, hurricanes, and floods go beyond the simple cases seen daily in the public and private hospitals in Bahrain. These injuries include but are not limited to complicated fractures, limb amputations, burns, spinal cord injuries, traumatic brain injuries, and peripheral nerve injuries (WCPT, 2016). The extent of medical pathologies can be broadened to include respiratory complications because of the aspiration of contaminated water or living in unhygienic

environments. Consequently, the emergency medical team, including PTs, should have expertise in managing these cases above and have the required skills to perform splinting, first aid, and orthotics and prosthetics prescription (WCPT, 2016). Currently, there are no PTs specialized in or hold a degree or a professional certificate in treating burn injuries, amputations, prosthetics, and orthotics prescription or are experienced enough to deal with the complexity of these cases.

Many countries have placed emergency strategic planning, preparedness, and disaster management as a top priority (Amatya, Galea, Li, & Khan, 2017). Unfortunately, some disastrous events, such as earthquakes, could occur without prior warnings. Thus, disaster response or plans may be in insufficient to cope with it. Some of the nearby countries already faced disasters such as earthquakes in Iran, floods in Saudi Arabia and hurricanes in Oman (Fritz, Blount, Albusaidi, & Al-Harthy, 2010; Pallister et al., 2010; Subyani, 2011). In Bahrain, the National Center for Disaster Management Crisis (NCDMC) was established in 2003 to coordinate with the MOH and other entities to oversee the delivery of healthcare services during disasters and emergencies (MOI, 2016). It is not confirmed if physiotherapy is included in the national disaster management strategy. A review by Khan et al. (2015) emphasized the importance of incorporating rehabilitation with its various areas into disaster management planning. Moreover, investment in physiotherapy and rehabilitation services is essential at this stage to mitigate the effects of future disasters. It is an important issue to consider since most PTs in Bahrain do not have specialized skills and training to deal with the complex cases associated with a disaster.

5. Conclusion

The number of PTs per 10,000 persons in Bahrain is below the world's average, and the current specializations of the licensed PTs may be insufficient to handle the complex cases of a disaster. The issue of how many physiotherapists needed per person or during a disaster requires extensive assessment of the physiotherapy services, infrastructure, human and financial resources. The data of disaster response that occurred in a similar context should be considered when setting the response strategies. Most importantly, physiotherapists should be included in the national disaster planning committees due to their knowledge and expertise.

6. Limitations

The figures obtained from the NHRA, IGA, and MOH are not up to date, and may not reflect the actual needs of the local health sector and the readiness to deal with disasters. Although the health care facilities that were included in the survey represent the public and private sectors, several major public and private hospitals were not included. Therefore, the results may be slightly biased. Also, the lack of quantitative data related to physiotherapy services and staff in Bahrain, and the absence of comparable data from nearby countries may have affected the analysis of the result.

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