

REVIEW

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Management of chronic and neuropathic pain—journey mapping in Egypt

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Abstract

Background Epidemiological studies on the prevalence and management of chronic low back pain (CLBP), osteoarthritis (OA), and diabetic peripheral neuropathy (DPN) are limited in Egypt. This review aimed to map and identify data gaps in the patient journey touchpoints for CLBP, OA, and DPN.

Main body of the abstract An evidence-based mapping approach using MEDLINE, Embase, and Biosis databases were used to identify records between January 2010 and December 2019. Quantitative data synthesis was performed using simple mean or weighted mean, whereas qualitative information was synthesized using a narrative summary. For CLBP, of the 79 records retrieved, 11 were eligible for final analysis (7 CLBP and 4 OA records), and for DPN, of 42 records identified, 13 studies were eligible. For CLBP, data available for prevalence, awareness, and treatment were 34.3%, 39.5%, and 70.0%, respectively. The prevalence of OA was 43.0%. The majority (98.6%) of patients with OA adhered to the treatment, and in 96.2% of the patients' symptoms were controlled. The prevalence of DPN was estimated to be 42.7%, synthesized evidence indicated that 14.1% of patients were aware of DPN and 22.7% underwent screening.

Conclusion As the existing literature is limited, further evidence-based studies are required to accurately understand the complexity of patient journey touchpoints in Egypt. Although the studies on musculoskeletal chronic pain syndrome are limited, the high prevalence of chronic low back pain, osteoarthritis and peripheral neuropathy should urge the health care system to organize the research groups and health care facilities to focus on these disorders and to consider them in the global health care plans.

Keywords Chronic pain, Egypt, Evidence map, Neuropathic pain, Patient journey

Background

Noncommunicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological,

environmental and behavioral factors that are responsible for 71% of all the mortality worldwide yearly. They have an exceptionally large impact and are responsible for 77% of all NCD deaths in low- and middle-income countries (LMICs) [1, 2]. This burden has increased manifold for LMICs due to underprepared health systems with limited number of trained resources, poor accessibility to healthcare and non-responsiveness of the government to combat against NCDs [3]. Being a middle- or low-income country, Egypt has a fragmented healthcare system; the ministry of health and population is the main service provider along with multiple service providers that function through multiple establishments [4]. Inadequate political framework, poor attention to health determinants, and

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pressing accessibility issues further make it difficult to tackle the rising burden of NCDs in Egypt [5].

Among the recognized NCDs, chronic pain is one of the leading causes of disability according to the Global Burden of Disease (GBD) injuries, and risk factors study, 2017 [6]. Chronic or persistent pain is defined as “pain that carries on for longer than 12 weeks despite medication or treatment.” It is common in people with comorbidities such as diabetes, arthritis, fibromyalgia, irritable bowel, and back pain [7]. Moreover, chronic pain syndromes affect women more than men; women report multiple pain locations, which are more frequent and intense when compared with men [8]. Previous studies reported that chronic lower back pain (CLBP) and chronic neck pain are more prevalent in Egypt (53.2% and 75.1%, respectively) and have a major impact on individuals’ quality of life (QoL) [9]. This is higher than the global prevalence of lower back pain reported in a systematic review in 2019 by Fatoye et al., ranging from 1.4 to 20.0% [10].

Neuropathic pain (NP) is caused by a lesion or disease of the somatosensory system, including peripheral fibers (A β , A δ , and C fibers) and central neurons, which affects 7–10% of the general population [11]. The International Association for the Study of Pain (IASP) defines NP as “pain caused by a lesion or disease of the somatosensory system” [12]. NP is often misdiagnosed due to different manifestations of diseases, which has implications on the treatment as well [13]. According to IASP, careful consideration of anamnesis, proper clinical neurological examination, and sensory testing are recommended for NP diagnosis with screening tools such as Douleur Neuropathique in 4 (DN4) score Pain DETECT Questionnaire (PD-Q), are used for NP assessments [14]. The incidence of NP is likely to increase with the increased incidence of diabetes mellitus, osteoarthritis (OA), and rheumatoid arthritis. Furthermore, the increased incidence of NP also decreases QoL, due to higher costs of the prescribed medicines and visits to health care providers, as well as morbidity from pain and the instigating condition [10].

Surprisingly, despite such proven socio-economic impact and decreased QoL, no strategies have been delineated in the Egypt National Multisectoral Action Plan for prevention and control (MAPS) of NCDs on chronic and neuropathic pain management, a multisectoral action plan released by the Egyptian ministry of health and population. This lack of strategy in pain management needs addressal to improve patient satisfaction [11, 15]. Since there is a paucity of data on epidemiology, prevalence, treatment, and control of chronic and neuropathic pain management in Egypt, there is a prevailing evidence gap. Evidence gap maps are valuable tools

that help to address the policy issues about the evidence gap in pain management to facilitate patients’ trust in health system. Mapping the patient journey touchpoints such as disease awareness, screening, diagnosis, and so on will help to evolve a patient centric pain management strategy. Therefore, the present report aims to assess the prevalence data on chronic and neuropathic pain based on pre-existing data in Egypt, identify and map the prevailing gaps in pain management quantitatively in a semi-systemic literature research discussing the patient journey touchpoints [16, 17]. The objective of this semi-systematic review is to discuss the patient journey touchpoints in terms of disease awareness, screening, diagnosis, treatment, adherence, and control of pain for CLBP and DPN in Egypt and identify data gaps for CLBP, OA and DPN. This would eventually help evolve a patient-centric pain management strategy.

Main text

Methods: review design

A semi-systematic literature review was conducted and records describing patient journey touchpoints in terms of disease awareness, screening, diagnosis, treatment, adherence, and control of pain for CLBP and DPN in Egypt were screened over a period of 10 years (January 2010 to December 2019). The methods by which the review was conducted have been detailed elsewhere as Mapping the Patient Journey Towards Actionable Beyond the Pill Solutions (MAPS) [18]. For this literature search, neuropathic pain was defined as pain due to lesion or disease of the somatosensory system, including DPN and low back pain with a neuropathic component and chronic pain was defined as pain lasting > 3 months, including OA and CLBP [11, 19]. Six steps were used to construct the evidence map: (1) developing a comprehensive search strategy; (2) establishing the inclusion and exclusion criteria; (3) screening and shortlisting; (4) supplementing with additional and/or local data; (5) data extraction and synthesis; and (6) evidence mapping [17]. This current review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, with minor modifications in line with the scope of this study.

Data collection

An electronic structured search was conducted on databases (MEDLINE, Embase, and Biosis) using medical subject headings (MeSH) terms and relevant keywords for chronic and neuropathic pain, combined with search terms related to patient journey touchpoints. The detailed search strategy is presented in Table 1. An additional literature search (unstructured) was also conducted using the search terms pertaining to diabetes, hypertension,

Table 1 Search strings used for chronic and neuropathic pain

Chronic pain—excluding acute pain and neuropathic pain

• low back pain/OR chronic pain/ OR fibromyalgia/ OR rheumatoid arthritis/OR osteoarthritis/OR Arthritis/OR headache/OR Migraine/OR musculoskeletal pain/ OR "Chronic pain" or Fibromyalgia or "low-back pain" or rheumatoid or osteoarthritis* or "Arthritic pain" or "Arthritis pain" or headache or Migraine or "musculoskeletal pain" AND

• Incidence or Prevalence or Occurrence or burden or Epidemiolog* or Screen* or Treat* or Management or Therap* or Aware* or Unaware* or Knowledge or Diagnos* or Undiagnos* or Adheren* or Complian* or nonadheren* or non-adheren* or Control* or uncontrol* or Untreat* AND

• Egypt*

Neuropathic pain—excluding acute pain

• neuropathic pain/ OR neuralgia/ OR neuropathy/ OR neuropath* pain OR neurogenic pain OR neuralgia OR nerve pain OR diabet* neuropath* OR nerve injury OR peripheral neuropath* OR spinal cord injury or postoperative pain AND

• Incidence or Prevalence or Occurrence or burden or Epidemiolog* or Screen* or Treat* or Management or Therap* or Aware* or Unaware* or Knowledge or Diagnos* or Undiagnos* or Adheren* or Complian* or nonadheren* or non-adheren* or Control* or uncontrol* or Untreat* AND

• Egypt*

1. Search filters—year 2010–2019 (search from 11 December 2019), Human, English, full text

2. Search terms for the unstructured search, in addition to similar MeSH terms as shown above → hypertension, diabetes, obesity, cardiovascular disease

obesity, and cardiovascular disease, via Google Scholar, websites of Ministry of Health of Egypt, Incidence and Prevalence Database (IPD), the World Health Organization (WHO), and National clinical practice and treatment guidelines to address data gaps in structure search. No date limits were applied to the unstructured search.

Inclusion and exclusion criteria

Studies were included if they were (i) conducted on humans aged ≥ 18 years; (ii) not restricted to a specific patient subgroup, such as patients with comorbidities and pregnant women; (iii) peer-reviewed published systematic review and/or meta-analysis, randomized controlled study, observational study and narrative reviews (full-texts published and conference abstracts); (iv) reporting quantitative data from the patient journey touchpoints for chronic and neuropathic pain, which includes awareness, screening, diagnosis, treatment, adherence, and control of pain; (v) studies conducted on patients with depression; (vi) nationally represented; and (vii) published in the English language between 01 January 2010 and 11 December 2019. To account for the unavailability of relevant studies at the national level with a sample size ≥ 500 , studies not restricted to a specific patient subgroup (e.g., patients with comorbidities and pregnant women), or single-center experience or studies with sample size < 500 were included.

Case studies, letters to the editor, editorials, studies with specific patient subgroups (e.g., those with comorbidities), those not representing the adult population, data from countries other than Egypt, published in languages other than English, duplicate studies, studies without full-text, studies not focusing on chronic and neuropathic pain and studies published prior to January 2010 were excluded.

Data review

Two independent reviewers conducted both the structured and unstructured searches by screening the titles, abstracts, and keywords of each study for relevance. Reviewer 1 retrieved the records from the literature sources and performed level 1 screening based on the title and abstracts of the publication. After the records were shortlisted, reviewer 2 performed level 2 screening, which determined the eligibility of the shortlisted records to be included in the analysis based on the pre-defined inclusion and exclusion criteria. Any disagreements that arose were reconciled by a discussion among both the reviewers.

Data extraction

After the manual screening, relevant data from the selected records were exported into a data extraction grid and was verified by both the reviewers. Followed by the synthesis, an evidence gap map framework was used to illustrate the synthesized evidence. The following information was extracted from each selected study: (1) first author's last name, year of publication, and citation; (2) study title; (3) patient journey data for chronic and neuropathic pain (prevalence, awareness, screening, diagnosis, treatment, adherence, and control).

Statistical analysis

Quantitative data synthesis was performed using simple mean (for single observations without sample size) or weighted mean (for multiple observations with sample size for each record), whereas qualitative information was synthesized using narrative summary. A

summary of outcomes is visually presented in the form of a tabular summary of outcome results.

Results

Chronic pain

Search results

A total of 79 records were retrieved for chronic pain in Egypt using structured ($n=68$) and unstructured searches ($n=11$). Following the data mining process, 11 records met the inclusion criteria. The most common reasons for studies being excluded were not relevant ($n=58$), case reports ($n=4$), not describing nationally representative population ($n=1$), not including adult population ($n=1$), and non-availability of patient journey data ($n=4$) (Fig. 1).

Description of included studies

The records revealed by the literature search related to chronic pain are listed in Table 2.

Mowaffak et al. reported the prevalence of OA in Egyptian patients with DM and nondiabetic subjects as 76.0% and 53.0%, respectively ($p < 0.001$) [20]. Affi et al. reported that the prevalence of knee OA was 83.3% in Egyptian patients with metabolic syndrome as compared with 63.3% in Egyptian patients without metabolic syndrome [21]. Mohamed et al. reported that the lifetime, 12-month and point prevalence of work-related low back pain was 54.5%, 44.1% and 38.9%, respectively. In addition, the prevalence was high in males (59.2%) and with those being in physical therapy specialties such as cardio-pulmonary (66.6%), pediatric, (57.1%), and orthopedic (54.4%) [22].

The overall key findings from this study on patients with chronic pain are summarized in Table 3. Osteoarthritis (43%) was more prevalent in Egypt followed by CLBP (34.3%). There was no data related to screening and diagnosis in OA and CLBP. Access to CLBP treatment was reported by 70% of the total population. For OA, treatment adherence (98.6%) and subsequent disease

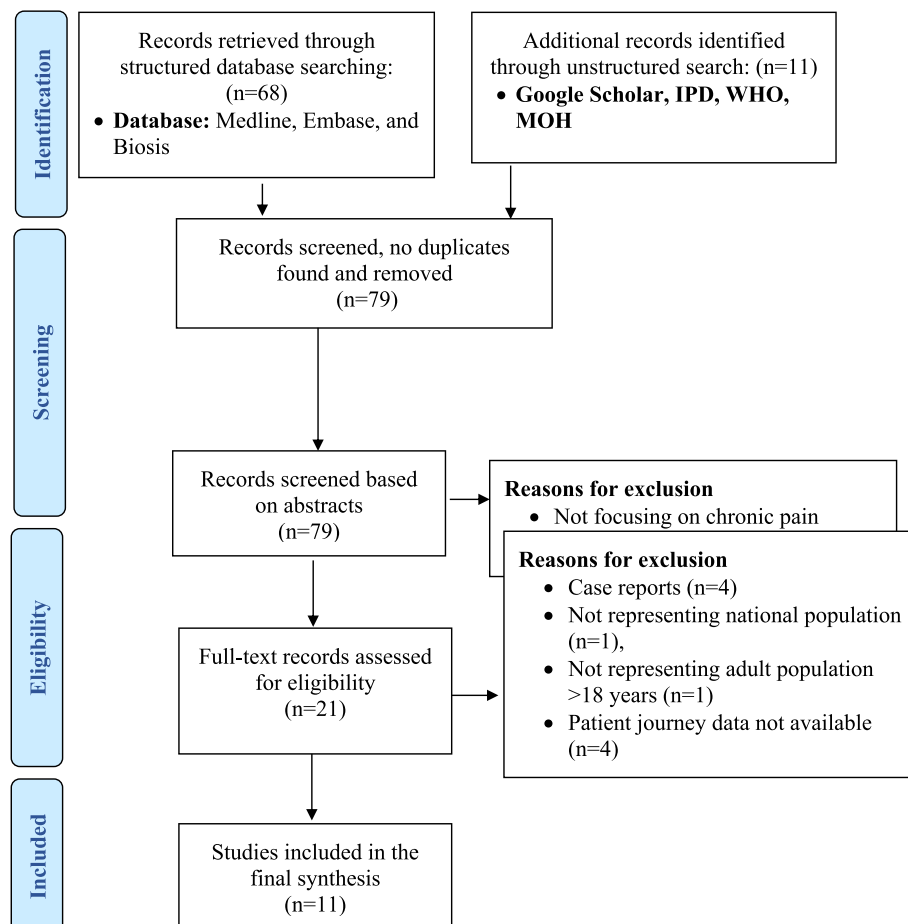


Fig. 1 Flow diagram for screening of studies on chronic pain

IPD, incidence and prevalence database; MOH, Ministry of Health of Egypt; n, number of records, WHO, World Health Organization

Table 2 List of publications on chronic pain included in the study

S. No	Title	Citation	Authors	Year
1	Prognostic factors of short-term outcome of low back pain in patients attending health insurance clinics in Sharkia governorate, Egypt	Int Sch Res Notices., 2012; Article ID 294895	Khaled Kasim, Abedel-Aziz El Sadak, Haytham Hassan, Alaa Abdel-Wahed, and Samy Shaaban	2012
2	Use of ibuprofen sustained release for treating osteoarthritic pain: findings from 15 general medical practices in Egypt	Open Access Rheumatol. 2014; 6:49–56	Khalifa Nabil, El-Husseini Timour, Morrah Ahmed, Mostafa Elshenawy, Hamoud Hesham	2014
3	Nursing intervention protocol for adult patients experiencing chronic low back pain	Cent Eur J Nurs Midw. 2015; 6(4):343–51	Nadia Mohamed Taha, Noha Ahmed Mohamed, Nahla Ahmed Abd El-Aziz	2015
4	Low-dose spironolactone: treatment for osteoarthritis-related knee effusion. a prospective clinical and sonographic-based study	J Rheumatol. 2016; 43(6):1114–20	Elsaman M Ahmed, Radwan R Ahmed, Mohammed I Walaa, Ohrndorf Sarah	2016
5	Burden of musculoskeletal disorders in the eastern Mediterranean region, 1990–2013: findings from the GBD study 2013	Ann Rheum Dis. 2017; 76(8):1365–73	Moradi-Lakeh M, Forouzanfar MH, Vollset SE, et al	2017
6	Prevalence of low back pain among physical therapists in Cairo-Egypt	Int J Ther Rehabil. 2017; 6 (4):21–30	Ibrahim Tobba Mohamed, Olfat A Kandil, Maha. M. Mohammed, Salwa F. Abd elmageed	2017
7	Osteoarthritis of knee joint in metabolic syndrome	Clin Rheumatol 2018; 37: 2855–2861	Abd EL- Moaty Ali Afifi & Reham Magdy Shaat & OL M. Gharbia & Yosra EL Boghdadi & Mervat Mohammad EL Eshmawy & Ola Ali El-Emam	2018
8	Prevalence of knee osteoarthritis among Egyptian diabetic type 2 patients	Int J Physiother Res. 2018; 6(2):2654–59	Mowaffak Mostafa Abd El Hamid, Noha Abd El Halim El Sawy, Abba Ahmed Abo Zeid, Riham Abdelmaksoud Hamed Abdelmaksoud	2018
9	Depression in patients with chronic low back pain	Egypt Rheumatol Rehabil. 2019; 46:48–54	Nassar N, Assaf N, Farrag D, Ibrahim D, Al-Sheekh A	2019
10	Non-steroidal anti-inflammatory drugs among chronic kidney disease patients: an epidemiological study	J Egypt Public Health Assoc. 2019; 94(1):8	Abd ElHafeez Samar, Hegazy Reem, Naga Yasmine, Wahdan Iman, Sallam Sunny	2019
11	Relation between body mechanics performance and nurses' exposure of work place risk factors on the low back pain prevalence	J Nurs Educ Pract. 2019; 9(3):25	Yossria EL-Sayed Hossein, Hend Elham. Mohammed, Amal H. Mohammed	2019

Table 3 Findings on patient journey touchpoints in Egypt-chronic low back pain and osteoarthritis

Indications	Prevalence	Awareness	Screening	Diagnosis	Treatment	Adherence	Control
Chronic low back pain	34.3% ^{abd}	39.5% ^{abd}	Data not available		70.0% ^{ad}	Data not available	
Osteoarthritis	43% ^{acd}	Data not available				98.6% ^{ad}	96.2% ^{abd}

^a Studies including population sub-groups, single center studies or sample sizes < 500

^b Weighted average

^c Simple average

^d Peer reviewed publication

control were observed by majority (96.2%) of the population (Table 3).

Neuropathic pain

Search results

A total of 42 relevant studies for neuropathic pain in Egypt were identified through database searches (25 records from structured search and 17 records from unstructured search), of which 26 did not meet the

inclusion criteria. The remaining 13 studies were subjected to data evaluation/qualitative synthesis (Fig. 2).

The characteristics of included records related to neuropathic pain are listed in Table 4.

Description of included studies

The overall key findings from this study on patient journey related to neuropathic pain are summarized in Table 5.

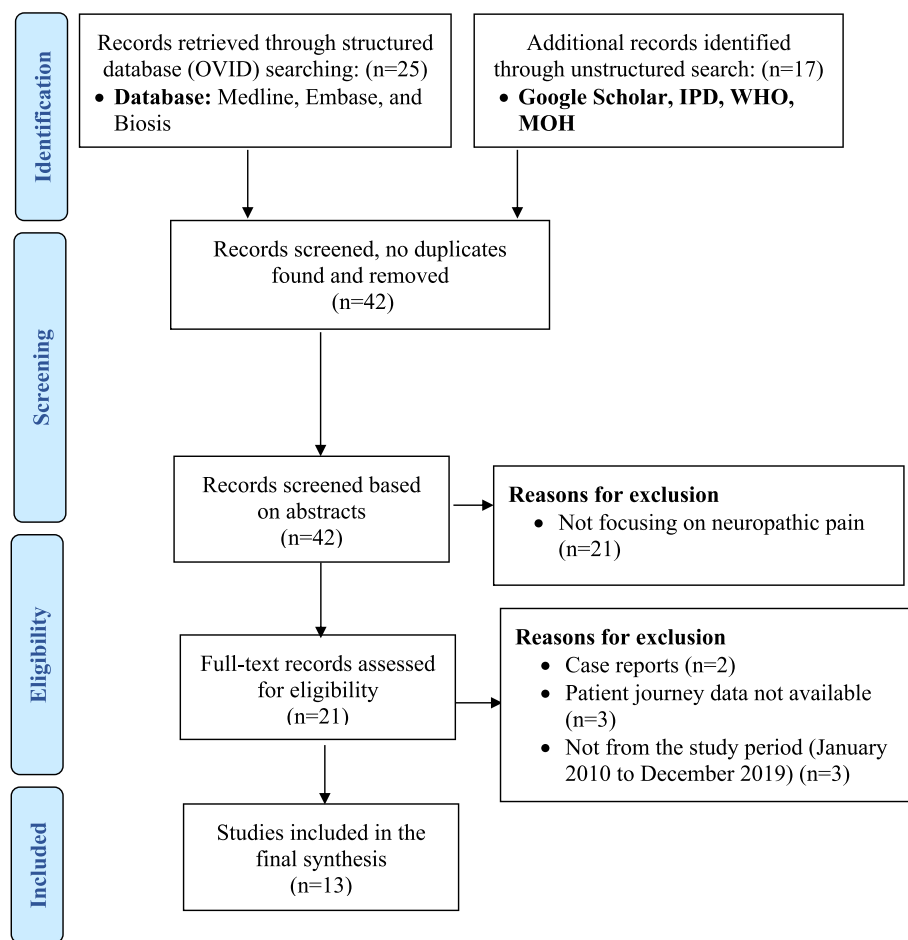


Fig. 2 Flow diagram for screening of literature on diabetic peripheral neuropathy

IPD, Incidence and Prevalence database; MOH, Ministry of Health; n, number of records; WHO, World Health Organization

According to the International Diabetes Federation (IDF), Egypt, holds the ninth position globally in terms of the prevalence of type 2 diabetes mellitus (T2DM) among its population. The prevalence of T2DM in Egypt has been almost tripled over the last two decades [23]. Jambart et al. reported that the prevalence of DPN was 53.7% among patients with diabetes mellitus in the Middle East region [24]. The study by El-Nahas et al. revealed a low prevalence of neuropathy (10.2%) and peripheral arterial disease (3.1%) among Egyptian diabetic patients. The prevalence of neuropathy was much higher among the American diabetic population versus Egyptian diabetic patients (28.5% vs. 10.2%) [25]. They also reported that the prevalence of diabetic foot ulceration was still high (6.9%) in Egyptian diabetic patients [24]. Assaad et al. examined the prevalence of diabetic foot problems in Egypt and showed that the prevalence of sensory neuropathy was 29.3% (male 30.7%; female 27.9%) and the prevalence of peripheral vascular disease was 11% (male

11.8%; female 10.2%) [26]. Assaad et al. reported that the prevalence of peripheral neuropathy in newly diagnosed and known T2DM patients was 3.3% and 29.4%, respectively [27].

Only the prevalence data (42.7% in diabetics) about DPN was found in the literature. No information about low back pain with neuropathic component was found. Moreover, very limited awareness was observed in patients with DPN about timely medical care (14.1%), which reflected in low access to the screening facilities (22.7%).

Discussion

This review explored patient journey touchpoints which could be helpful to develop a patient-centered pain management strategy. There has been significant lack of epidemiological evidence in Egypt regarding chronic pain with neuropathic characteristics including the public sources and pain registries. To the best of our knowledge,

Table 4 List of publications on neuropathic pain included in the study

Sl No	Title	Citation	Authors	Year
1	Peripheral neuropathy in type-II diabetic patients attending diabetic clinics in Al-Azhar University Hospitals, Egypt	Int J Diabetes Mellit. 2010; 2 (1):20–23	Khaled Kasim, Morsy Amar, Abdel Aziz El Sadek, Said Abdel Gawad	2010
2	Prevalence of painful diabetic peripheral neuropathy among patients with diabetes mellitus in the Middle East Region	Int J Med Res. 2011; 39: 366–77	S.Jambart, Z Ammache, F Haddad, A Younes, A Hassoun, K Abdalla, C Abou Selwan, N Sunna, D Wajsbrot, E Youseif	2011
3	Diabetic complications in Egyptian patients with and without hepatitis C virus-related liver cirrhosis: a cross-sectional study	Egypt Liver J.2012; 2(2):51–54	Khaled H. Hemida, Khaled Z. El-Karmouty, Eslam Safwat and Sherif S. Shabana	2012
4	Epidemiology of and risk factors for type 2 diabetes in Egypt	Ann Glob Health. 2015; 81(6):814–20	Refaat Hegazi, Mohamed El-Gamal, Nagy Abdel-Hady, Osama Hamdy	2015
5	Prevalence of diabetic foot disorders and related risk factors among Egyptian subjects with diabetes	Prim Care Diabetes. 2015; 9(4):297–303	S.H. Assaad-Khalil, A.Zaki, A.Abdel Rehim, M.H. Megallaa, N.Gaber, H.Gamal, K.H.Rohoma	2015
6	Quality of medical care provided to type 2 diabetic patients attending Alexandria Main University Hospital, Egypt	Egypt J Obes Diabetes Endocrinol. 2016; 2:1–6	Esmail AA, Elweshahi HM, Elmotey DA	2016
7	Awareness on risk factors for diabetic mellitus and diabetic peripheral neuropathy among the Nationalities of Egypt and Saudi Arabia	Int J Med Sci Clin Invent. 2017; 4(11):3317–21	Silvia Edison J, Laila Abdelnaby Hamed Ali	2017
8	Foot care knowledge assessment among type 2 diabetic patients attending three family medicine centers in Cairo	EJCM. 2017; 35(3):43–53	Diaa Marzouk, Rana A El-Hilaly, Dalia G Sos, Nouran Fakkar	2017
9	Self-management practices in type II diabetic patients: A cross-sectional survey in Alexandria, Egypt	Pharmacoepidemiology and Drug Safety. Conference: 33rd International Conference on Pharmacoepidemiology and Therapeutic Risk Management. Canada. 2017; 26(2):151	Nagib R, Abdul-Latif M, Atta L.A, Mekawy M.A, Abou-Ali A	2017
10	Risk factors of diabetic foot in type 2 diabetic patients, Menoufia University Hospital, Egypt	EJCM. 2018; 36(2):87–98	Aml A. Salama and Shima Kamal Zorin	2018
11	Risk factors for diabetic foot ulcer recurrence: A prospective 2-year follow-up study in Egypt	Foot (Edinb). 2018; 35:11–15	Khalifa WA	2018
12	Association of diabetic foot ulcers with chronic vascular diabetic complications in patients with type 2 diabetes	Diabetes Metab Syndr. 2019; 13(2):1287–92	Megallaa MH, Ismail AA, Zeitoun MH, Khalifa MS	2019
13	Prevalence of chronic diabetic complications in newly diagnosed versus known type 2 diabetic subjects in a sample of Alexandria Population, Egypt	Curr Diabetes Rev.2019; 15(1):74–83	Samir Assaad Khalil, Magdy Helmy Megallaa, Kamel Hemida Rohoma, Myriam AbouSeif Guindy, Adel Zaki, Mohamed Hassanein, Amin Helmy Malaty, Hanaa Mohamed Ismael, Ibrahim Fahmy Kharboush, Dalal Nasr-Eldin El Kafash, Hassan Nooman Sallam, Iman Abdelkareem Desouky	2019

Table 5 Synthesized findings on patient journey touchpoints in Egypt—neuropathic pain

Indications	Prevalence	Awareness	Screening	Diagnosis	Treatment	Adherence	Control
Diabetic peripheral neuropathy	42.7% ^{acd} (in diabetics)	14.1% ^{abd}	22.7% ^{ad}	Data not available			
Low back pain	Data not available						

^a Studies including population sub-groups, single center studies or sample sizes < 500

^b Weighted average

^c Simple average

^d Peer reviewed publication

this is the first report which assessed the prevalence data on chronic and neuropathic pain based on the literature in Egypt. The findings of this report indicated that the prevalence of OA in Egypt was estimated to be 43%, whereas prevalence of CLBP was 34%. Similarly, the prevalence of DPN was found to be 42.7% in Egyptian patients with diabetes.

Data from the 2010 GBD study provided evidence that the arthritis prevalence in LMICs may be more than in the higher-income countries [28]. Also, the prevalence of OA and CLBP in LMICs will potentially have a greater impact on patients' ability to work and participate in communal activities than in high-income countries due to the reduced capacity of LMICs to avoid and/or alleviate the impact at individual and national levels. This is especially important considering that musculoskeletal disorders are not included in the 'top 4' NCD programs, which include cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes [29]. This review reports that 70% of the total Egyptian population had access to treatment for CLBP, whereas patients with OA had treatment adherence rate of approximately 99% and disease control rate of 96%. In the present review of published literature, there was no study evaluating screening and diagnosis of OA and CLBP in Egypt and no study has reported the incidence of CLBP with a neuropathic component. Only 14% of patients with DPN were aware of the importance of timely medical care, which reflects in lower access to the screening facilities (22.7%).

In LMICs where pain management is less than optimal, the burden of chronic, and possibly untreated pain will be compounded by social and environmental stressors that require individuals to work and fulfill community roles regardless of the pain [30]. Data from WHO collaboration reported that 5–33% of individuals in LMICs experience chronic pain on a daily basis [31]. Moreover, compared with higher-income countries, residents of LMICs with arthritis, experience reduced access to healthcare, and could not afford or utilize treatments including analgesic and anti-inflammatory pharmacotherapies [16, 17, 32, 33], or arthroplasty for advanced

disease [19, 20, 34, 35] in the context of scarce medical and social support systems.

In Egypt, the possible reasons for very limited data on other patient journey touchpoints in chronic and neuropathic pain could be due to underreporting of symptoms, lack of screening campaigns, less efficient infrastructure to handle large data with limited knowledge about data security and privacy. Other factors such as excessive workload, lack of productive time for researchers, existence of research incentives, inability to understand statistical terms and inadequate understanding about evidence-based medicine have been identified to cause hindrance in robust evidence generation. Formal protocols on patient identification, balance in the patient-staff ratio, readily available multidisciplinary task force to ensure easy access, in-depth training in optimizing patient care, improved work expertise of the healthcare personnel as per the needs of patient and sound clinical experience are the pre-requisites for adequate pain management in patients. However, there has been no evidence available at clinical level to prepare the health system for the same, resulting in failure to render quality care to the patients [36].

Despite the advances in diagnosis and treatment of NCD during the last few decades in higher-income countries, there has been no impact on many LMICs including Egypt, which are primarily resource-poor in healthcare [28]. Governments of the LMICs are constrained by competitive social, economic, health- and poverty-related issues; this frequently results in prioritizing healthcare needs rather than chronic diseases, especially in an environment with poor education, growing population and scarce resources [37, 38].

In a country, gross domestic product and health care expenditures per capita are strongly correlated [35, 39]. Not only is suboptimal access to healthcare a concern, but the cost of healthcare may be many-fold the gross domestic product, and thus unattainable for the majority of the population of LMICs [40]. For many individuals and households in LMIC, there are inadequate financial resources to manage the cost of chronic disease, with an impoverishing effect due to out-of-pocket healthcare

payments [41]. As a solution to the out-of-pocket healthcare expenses, WHO is encouraging countries to provide universal health coverage [37]. For LMICs the provision of universal health coverage may be in the form of community-based health insurance schemes, whereby the community voluntarily raises, pools, allocates, purchases, and supervises the finances for healthcare [39, 42]. While there are some national efforts to prioritize healthcare resources and achieve universal health coverage, these schemes are likely to focus on supporting healthcare for diseases that cause early mortality rather than those that result in disability.

This evidence gap map for the care of patients with chronic and neuropathic pain in Egypt used a semi-systematic approach to report current evidence and identify gaps. Accurate estimates of awareness, screening, diagnosis, and treatment could not be computed due to the minimal data provided. The review was limited to English-language resources published or otherwise available within the past 10 years, decreasing the potential usefulness of the evidence gap map to non-English-speaking stakeholders. In this research, we did not comment on study biases or evaluated the quality of reporting of the findings presented in the records.

Conclusion

The findings of the present study emphasize the need for patient-centric care in Egypt. Given the data gaps, it is essential to encourage researchers to get acquainted with novel research methodologies such as patient-preference studies, patient engagement, multi-criteria decision analysis and qualitative research to sense the pulse of patient community in Egypt regarding the needs for chronic pain management. Further, a collaborative care delivery model would be recommended in Egypt, to foster collaboration between multiple stakeholders, namely community groups, health care professionals, health care administrators, policymakers, and government agencies. Also, we encourage to engage with the pharmaceutical industry players in campaigning activities to increase awareness among the patients through television and social media-based awareness events. These suggestions when implemented at a national level can help in the prevention and management of chronic diseases and thereby improve healthcare in Egypt.

Abbreviations

NCDs	Non-communicable diseases
LMICs	Low-middle income countries
CLBP	Chronic low back pain
QoL	Quality of life
NP	Neuropathic pain
OA	Osteoarthritis
DPN	Diabetic peripheral neuropathy

T2DM	Type 2 diabetes mellitus
GBD study	Global Burden of Disease study
IASP	International Association for the Study of Pain
MAPS	Multisectoral Action Plan for prevention and control
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
WHO	World Health Organization

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Authors' contributions

SARK, NMN, SA, MY, SN, and MCY participated in the design of the study and performed the analysis. SARK, NMN, SA, MY, SN, and MCY conceived of the study and participated in its design, coordination and helped to draft and reviewed the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The data that support the findings of this study are available from the authors, upon reasonable request.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

Dr. Sherif Ahmed Radwan Khaled represented as a speaker for some pharmaceutical companies for honoraria.

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