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Perceived barriers, benefits, facilitators, and attitudes of health professionals towards multidisciplinary team care in type 2 diabetes management : a systematic review

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Perceived barriers, benefits, facilitators, and attitudes of  
Health Professionals towards multidisciplinary team care  
in Type II Diabetes Management.

## Abstract

**Background:** The essence of multidisciplinary team approach to provide exercise, diet, and insulin therapy in T2DM treatment has long been recognized. In reality, however, most patients with T2DM do not have access to a multidisciplinary team and receive their diabetes care in the office of an internist or family practice physician. Therefore, the aim of this study is to investigate the perceived barriers, attitude, facilitators, and benefits in healthcare professionals toward multidisciplinary team approach in T2DM treatment. **Methods:** A systematic search strategy was performed in six databases (PubMed, Web of Science, CINAHL, EMBASE, MEDLINE, and Cochrane) using different keyword combinations, resulting in 19 studies. Studies whose primary focus is healthcare professional's views of multidisciplinary team care in type 2 diabetes. Textual narrative synthesis was used to analyse data. The Critical Appraisals Skills Programme (CASP) tool for qualitative studies was used to assess risk of bias and transferability. **Results:** Health professional's views about multidisciplinary team care in T2DM was categorized into six (6) major factors namely: working collaboratively to foster supportive relationships; strong committed organizational and team leadership; diversity in expertise, with team members tailored to local circumstances; shared goals and approaches to ensure consistency of message; clear and open communication with the team and with patients; and the patient at the center of decision-making. **Conclusions:** There is a huge gap in shared roles among health professionals in T2DM therapy. Hence, diabetic patients do not have access to physiotherapy and dietetic services for appropriate exercise prescription and dietary care respectively. The factors identified seamlessly cut across three hierarchal levels namely, health management; health professionals; and diabetic patients. Thus, diabetic patients are an integral part of multidisciplinary team care.

Key words: Type 2 Diabetes, multidisciplinary team care, physiotherapy, qualitative research, Health professionals, views.

## INTRODUCTION

Diabetes is a complex chronic disease that has now been recognized as an epidemic globally<sup>1-2</sup> and a major threat to global health and development<sup>3</sup> requiring continuous medical care with multifactorial risk reduction strategies beyond glycemic control.<sup>4</sup> The prevalence of diabetes is increasing everywhere except for a select few countries. In 2015, nine percent of adults around the world (415 million people) have diabetes and by 2040, this figure is predicted to rise to 642 million people, with the largest affected population in low- and middle-income countries.<sup>3</sup> There are three main types of diabetes; type 1, type 2 and gestational diabetes (GDM). Type 2 diabetes (occurs a result of progressive insulin secretory defect on the background of insulin resistance)<sup>4</sup> account for 90% of the total diabetes burden. It is commonly seen in older adults but increasingly found in children, adolescents and younger adults due to rising levels of obesity, physical inactivity and poor diet.<sup>5</sup>

Glycated hemoglobin (HbA1c) is a hemoglobin-glucose combination formed non-enzymatically within the cell that tells average level of blood sugar over the past 2 to 3 months and a maker for assessing the risk of cardiovascular complications. The American Diabetes Association (ADA) and International Diabetes Federation (IDF) recommend a goal of controlling HbA1c (aiming to keep it below 7%). The latter recommends glycemic control within 7.0–7.5% among functionally independent and 7.5–8.0% among older functionally independent patients with T2DM.<sup>6</sup> Hence, minimize T2DM associated risk of acquiring serious macrovascular (including hypertension, myocardial infarction (MI), congestive heart failure, stroke and peripheral artery disease) and microvascular (including neuropathy, retinopathy and nephropathy) complications.<sup>7</sup> These complications add to the healthcare burden, adversely affecting quality of life and increasing healthcare utilization, which could be devastating in low-and middle-income countries battling with challenges of eradicating infectious diseases and its concomitant intersection with increasing epidemic of chronic non-communicable diseases, with both diseases coexisting in the same population.<sup>2</sup> People with diabetes have to live the rest of their lives with the condition.<sup>1</sup> Unfortunately, patients with T2DM have low risk awareness in most dimensions of risk

*“Three horses draw the diabetic chariot and their names are diet, exercise and insulin. In fact, all of us in our life’s journey depend on the three, but seldom recognize the third although we often realize we are poor charioteers. Yet we fortunate ones have instinct to help us hold the reins, but the diabetic cannot trust his instincts as a guide, and in place of it must depend upon dieticians, nurses and doctors unless he understands his disease”.<sup>6</sup>*

perceptions for diabetes-related complications, thus, this necessitates lifestyle changing interventions that could encourage self-care behaviours and treatment adherence.<sup>8</sup> In the early 1900s, Dr. Elliott P. Joslin (a pioneer in diabetes) first emphasized that diabetes mellitus is a clean and non-infectious, but chronic, illness and that team care is absolutely necessary for patients. He wrote:

There has been a shift from the traditional, physician-led ‘acute-care model’, in which diabetic patients are less involved in their care and team members are often primarily task-oriented, to a ‘chronic care model’, in which multidisciplinary team members are equal and interdependent, and the diabetic patients actively involved in their daily care.<sup>9</sup> Such teams include, but are not limited to, physicians, physical therapists, dietitians, nurses, podiatrists, sociologists, pharmacists, laboratory scientists, and mental health professionals with expertise and a special interest in diabetes”.<sup>4</sup>

Multidisciplinary team (i.e. the coming together of health professionals to achieve a common goal) care requires healthcare professionals not just to have the necessary expertise in their chosen fields but to be skilled in an interprofessional approach.<sup>1</sup> Multidisciplinary treatments have positive impact on both medical and nonmedical aspects. Increased treatment compliance and cost-effectiveness are some examples of its benefit. It is also associated with statistically significant reduction in HbA1C level.<sup>10</sup> The multidisciplinary team approach to T2DM management (i.e. the collaboration of different healthcare disciplines to treat patients with T2DM) is developed on the context of communal framework, in which clinical decision making is made by the insight of several healthcare professionals. Basically, this requires developing team base on common culture and prioritizing professional and social interaction. The goal of multidisciplinary team approach in T2DM treatment is to ensure seamless integrated approach to individualized care through coordinated activities around the complexities of screening, diagnosis, early and late management, and treatment of complications.<sup>1</sup>

In an integrated T2DM care model, innovative teamwork between primary care professionals and specialists can result in the development of a novel healthcare institution that can provide integrated diabetes care revolving around individual patient, with the aspiration of having an institutionalized clinical pathways and financial planning that all align seamlessly. The primary

aim is to integrate the healthcare system, coordinate services, and synchronize primary and specialist care in a setting nearer the patient's home, where applicable. Thus, upskilling of primary care professionals and ongoing support from specialist is necessary for a successful integrated T2DM care model. The components of Integrated T2DM care model is broadly similar in all Countries but the mode of implementation might differ based on local needs and availability of various resources (Appendix 1).<sup>1</sup>

Multidisciplinary team collaboration is fundamental for efficient integrated T2DM care model because no single healthcare professional can effectively deliver all the components of T2DM treatment.<sup>2</sup> Margaret McGill<sup>11</sup> reported successful implementation of multidisciplinary team care in T2DM from experiences of real-world scenarios despite significant barriers such as established hierarchal structures and financial resource constraints. For example, in the USA (An Interdisciplinary team approach in an integrated health care delivery system “Ochsner Medical Center’s ‘Diabetes Empowerment Clinic’” at Ochsner Health System primary care clinics in South East Louisiana); Hong Kong (Integrated diabetes care model at the Chinese University of Hong Kong and Prince of Wales Hospital using the web-based Joint Asia Diabetes Evaluation (JADE) programme); United Kingdom: (‘Leicester model’ – primary care clinic categories); and Mexico (Interdisciplinary team diabetes care in a resource-poor environment. ‘Clínicas del Azúcar’ provide a community-based medical service for diabetes patients, facilitated by an Interdisciplinary team composed of physicians, nurse practitioners, dietitians, psychologists, physical trainers, sociologists and laboratory technicians). However, key contributing factors were illustrated in (Appendix 2).

The essence of multidisciplinary team approach in T2DM treatment has long been recognized. In reality, however, most patients with T2DM do not have access to a multidisciplinary team and receive their diabetes care in the office of an internist or family practice physician.<sup>12</sup> Therefore, the aim of this study is to investigate the perceived barriers, attitude, facilitators, and benefits in healthcare professionals toward multidisciplinary team approach in T2DM treatment.

## **METHODOLOGY**

The research was carried out by three (3) students (namely; UD, EK, ZE) under the supervision of a promoter, Professor Dr. Dirk Vissers. The research students randomly formed three (3) pairs (EK

and UD, ZE and EK, and ZE and UD). Each individual screened and appraise studies, then compare with his/her pair. Each pair managed the process of screening and appraisal separately, although the whole group got together regularly to discuss progress, general issues and harmonize results.

### **Eligibility criteria and study selection**

We used the following when searching: ‘Papers whose primary focus is healthcare professional’s views of multidisciplinary team care in type 2 diabetes management (excluding views only concerning monodisciplinary care approach)’. The study had to use qualitative methods of data collection and analysis. We chose not to set period limitation and country, believing that there is paucity of literature about the research question.

### **Information sources and search strategy**

UD used the following electronic databases: Ovid (MEDLINE and Cochrane), Web of Science, PubMed, and subscribed to KU Leuven library for EMBASE and CINAHL. He was aware that PsycINFO and Zetoc could also contain relevant data. However, the Antwerp Library Network informed him that PSYCINFO has been cancelled years ago because there was a large overlap with databases such as PubMed, Web of Science etc. and anyone outside the UK cannot subscribe to Zetoc.

The initial MEDLINE search was very detailed and produced a large pool of papers. Hoping for a more sensitive and focused search, UD tried simply using the terms ‘barrier’, ‘benefit’, ‘attitude’, ‘facilitators’, ‘health professionals’, ‘Physician’, ‘Allied health professionals’, ‘multidisciplinary’, ‘interprofessional’, ‘interdisciplinary’, ‘type 2 diabetes’, ‘non-insulin dependent diabetes mellitus’, and ‘qualitative’. The second, simpler, MEDLINE search produced a much smaller pool of potential papers, but all the relevant papers that had been identified in the first search (this simpler search produced no additional relevant papers). UD repeated these two searches in Cochrane. Again, the second, simpler, search produced all the relevant papers that had been identified in the first, more detailed Cochrane search. Thus, the simple search was just as sensitive as the comprehensive search in MEDLINE and Cochrane. Using Ovid, the first, detailed search of MEDLINE and Cochrane were combined and duplicates was removed (Appendix 6). Likewise, the second, simpler, MEDLINE and Cochrane were combined and duplicates were removed

(Appendix 7). Similarly, UD replicated a comprehensive search on PubMed, EMBASE, Web of Science, and CINAHL as shown in (Appendix 8 & 9) respectively.

### **Hand-Searching strategies**

For the hand-searches we asked ourselves to suggest studies anyone might think relevant. We checked reference lists of obtained papers. UD electronically searched the following journals via the University's library: Culture, Medicine and Psychiatry; Health Services and Outcomes Research Methodology; Journal of Advanced Nursing; Journal of Health Psychology; Medical Anthropology; Medical Anthropology Quarterly; Psychology and Health; Sociological of Health and Illness; Sociological Review; Social Science and Medicine; Qualitative Health Research; and Sociological Review.

### **Study selection**

For both the databases and hand-searched results, ZE, EK, and UD were responsible for deciding whether or not to include studies. The total selected studies from databases was categorized into three (3) ranges (i.e. serial number 1 to 133, 134 to 267, & 268 to 400) and were examined based on title & abstract to full text by UD and EK, ZE and EK, and UD and ZE respectively.

### **Results of searches**

Initial comprehensive Medline and Cochrane search produced 289 and 40 studies respectively, summing to a total of 329. However, after deduplicating this reduced to 292 studies. The simpler Medline and Cochrane search produced 17 and 7 studies respectively, summing to a total of 24. Similarly, after deduplicating it reduced to 19 studies. Web of Science produced 63 studies, one studies was deduplicated resulting in 62 studies. PubMed, CINAHL, and EMBASE produced 11, 44, and 17 studies respectively. These sum up to 445 studies, which were transferred to endnote X9. Deduplicating the studies on endnote X9 produced a total of 400 studies, which were screened based on title, abstract and full text. While screening, 20 duplicated studies were identified and deleted. Therefore, a total of 380 studies were screened. A breakdown of the yield from each of the different databases is illustrated in (Appendix 3). The electronic databases searches produced 17 studies for appraisal and the hand-searches 2, giving a total of 19 studies appraised for inclusion in the synthesis. Figure 1 shows the PRISMA flow chart.

### **Reproducibility of electronic search strategy**



Although, only one student, UD, conducted the electronic searches but he repeated the same searches strategies on each database seven (7) times in order to assess the reproducibility of the process. ES, ZD, and UD used the same PICO and examined title and abstracts before drawing up a list of papers for possible inclusion. In case of disagreements between us, we all meet to take conclusive decision. However, in case of unsolved disagreements, the promoter, Professor Dr Dirk Vissers was consulted for a final decision.

### **Summary of study quality**

We used CASP tool (see Appendix 12 and 13) to provide descriptive information on the quality of the included studies to inform interpretation of the evidence, instead of as a benchmark for either inclusion or exclusion. The tool was useful for enabling us to identify and document specific methodological concerns and limitations relating to individual studies. More so, to ascertain the *transferability* of the research findings to other specific settings. No risk of bias was identified in 12 studies.

### **Data extraction strategy and data analysis**

Extraction was done by ES, ZD, UD and analysis of study findings was undertaken by one student (UD). Reports of health professional's perceptions varied in publication formats. UD was then able to "reconstruct" the studies in a standard format, using evidence table (table 1) and structured summaries, to facilitate comparison between them. One student reconstructed the studies in a standard format, this meant that at least one member of the team had in depth knowledge of each study. This was labour intensive but crucial to the success of the synthesis.

The synthesis process was non-linear and involved the reviewer going back and forth between the original papers, our data extractions, and the evidence tables. We found it useful to draw on the metaphors normally associated with qualitative analysis to describe the process. For example, by rendering the views studies comparable we had immersed ourselves in the data as we constructed the synthesis.

Textual narrative synthesis was used for analysis. Findings are broken down, interrogated, and then combined into a whole via a listing of themes. UD worked by using both a priori themes to group studies as well as allowing themes to emerge. There were three main steps: classifying studies assessing aspects of health professional's views; comparing and contrasting findings across

studies; and thematic analysis was used to answer our over-arching question about barriers, facilitators, benefits, and attitudes. As shown in tables 2, 3, & figure 2 respectively.

## **RESULTS**

### **General study characteristics**

A total of 19 studies, were included in the review. One study presented the views of individuals recently diagnosed with type 2 diabetes in relation to self-management of dietary intake and physical activity, and to compare these with the views of health professionals (HPs). This study was included because a secondary aim was to elicit the views of HPs to self-management of dietary intake and physical activity. The details of all included studies are presented in table 1 and provide the context for the interpretations of each study.

### **Country**

The majority of the studies were conducted in Australia (n=4), UK (n=2), USA (n=3), and Ireland (n=3), with the remainder in Canada (n=2) and the following: Saudi Arabia, United Arab Emirates, Oman, Belgium, Mexico, Indonesia, and Netherlands (n=1 each). Appendix 4

### **Multidisciplinary team care models**

Overwhelming majority of the studies (n=18) examined health professionals views about an existing multidisciplinary team care model. Except one, Mc Hugh S<sup>31</sup> examined general practice perspective, in advance of the implementation of an integrated model of care in Ireland. However, a combination of the different models from the nineteen studies gives us an advantage to holistically examine the perceived barriers, benefits, facilitators, and attitudes of health professionals towards successful multidisciplinary team care in an integrated T2DM care models. Examples for such models are, lifestyle programmes (n=4), health care systems (n=8), weight management programmes (n=2), patient-centered care (n=6), and specialized diabetes care (n=3). The detailed description of multidisciplinary team care models entailed for each study (N=19) are presented in table 2.

### **Sample size**

Studies varied greatly in sample size. Two of the studies had the highest participants (n=179) and (n=154) respectively. While one study <sup>(3)</sup> had the lowest (n=7). All other studies had more than 10

participants. We excluded (n=12) participants in one study, whom were operative and administrative officers (n=9), mobile cart operator (n=1), and local healthcare districts heads (n=2). In total, this studies synthesis constitutes the perceptions of (N=732) health professionals, as shown in Appendix 5.

### **Sample characteristics**

Majority of the health professionals involved in the individual studies are general practitioners (n=409) and nurses (168) while other professionals are underrepresented (figure 6). MIDO Mobile Cart operator (n=1), operative and administration officers (n=9), local healthcare districts heads (n=2) were reported as adjunct participants, thus we did not take them into account in our synthesis. Majority of the health professionals work in primary health care settings as compared to those working in either secondary or tertiary health facilities. Similarly, those working in the public services were more compared those in the private practice. Minority of the studies reported age, gender, and years of working experience in diabetes care, as shown in table 1.

### **Textual narrative synthesis**

Textual narrative synthesis was used to answer our research question. It makes transparent heterogeneity between studies (as does meta-ethnography, with refutational synthesis). Thus, it makes clearer the context and characteristics of each study. As shown in table 7, the studies reported health professional's perception in one or all dimensions (i.e. barriers, benefits, facilitators, and attitudes). The details of the textual narrative synthesis are described using idea webbing in figure 2.

## **DISCUSSION**

### **Working collaboratively**

This review identified that lack of proper healthcare system and inadequate interprofessional collaborative skills are barriers to collaborative working. Among other factors, these includes, confusing funding practices by health providers; duplication of health services by mainstream and governmental agencies; ambiguous roles; uncertain competency and capacity; varying relationships and communication; and lack of developing trust and respect.<sup>19-20,24-25</sup> Health

managers don't understand where and when diabetes funding was derived from, which left them skeptical to employ diabetes educators to care for clients, fund adequate resources, or sponsor diabetes conference attendance. With regards to short-term funding,

*The Government . . . throw a whole lot of money . . . to run this programme . . . then the money runs out . . . everyone looks back on that Health Service . . . and they say . . . you are not going to help us anymore . . . instead of sticking to one programme . . . all of a sudden we're changing the programme . . . so many Pilot Programmes come and go . . . they wear the worker down . . . they talk about burn out rates . . . by making the RN's . . . apply for these short-term grants can be disheartening especially if you've applied for several grants and you're not successful . . . instead of . . . trying to . . . work around diabetes . . . you have to become an expert in another field to be able to work with your own people again (P1, P10).<sup>19</sup>*

This is particularly obvious in low and middle-income part of the world like Africa. In this continent, people face a health crisis driven by a double burden of disease, a nutrition transition, war and conflict, and poverty. Hence, health systems are under-funded and under resourced.<sup>32</sup>

Vertical hierarchy hinders collaborative, multidisciplinary team care in T2DM management. It is essential to change focus from historical and gendered roles and professional silos to one which celebrates a common commitment/shared goals and a focus on performance, positive intent and mutual respect for each other,<sup>20</sup> building consensus and coalitions of trust at the point of service delivery, and longer-term persuading organizational and institutional mindsets.<sup>17</sup> This is consistent with the findings of an insight into the overlapping provision of vision care services by ophthalmologists, general practitioners, orthoptists, optometrists and opticians in the Netherlands. It reveals pluralistic inter-professional status, more or less fixed-status hierarchies and dissatisfaction with the existing division of labour. More so, the preferences of the professions did not point to successful inter-professional co-ordination.<sup>33</sup>

### **Strong committed organizational and team leadership**

This study identified that poor administrative practices, and lack of a shared vision, are major perceived barriers to leadership. However, political support, alignments with current medical trends, and ongoing technical improvements (to ease adaptation and support), facilitates leadership in the team care. This is in accordance with the findings of M. McGill et al. 2017,<sup>11</sup> that team leaders should be conscious of when and how to be a team player. Inventiveness and flexibility within the team are vital given that interdisciplinary team care approach is influenced by several factors such as number of patients involved and resource constraints. It is also important that irrespective of job position or level of experience, every team member have the liberty to speak. While keeping in mind the respect for seniors, junior team members are often creative and have

innovative ideas that deserve to be heard. Hence, inclusivity within the team is promoted and job satisfaction enhanced.

### **Diversity of expertise**

A sparse diversity of health professionals with complementary expertise exists across integrated diabetes team models. Some of the barriers are patients' reluctance to see multiple providers, perceived lack of competence, and inadequately funded health care system. However, trusting and embedding new professional relationships, and synchronizing services and resources, facilitates diversity in expertise with team members tailored to local circumstances. Studies of registered dietitian nutritionists and diabetes specialist podiatrist<sup>34-35</sup> demonstrate diversity of expertise bring value to multidisciplinary team by providing care coordination, evidence-based care, and quality-improvement leadership. But the most significant barrier to integrating diverse expertise into primary care has been an insufficient reimbursement model.

### **Shared goals, and Clear and open communication with the team and with patients**

This review found that these two themes are seamless. Situating diabetes team in primary care involves utilizing existing healthcare structures and human resources. Shared goal approach is one of the pragmatic methods for successful implementation. Health professionals perceived this as beneficial and it could be achieved by initially outlining roles by diabetes educators and primary care providers, investment in the intervention by all stakeholders, and clear channels of communication that allow educators to perform their roles and leverage opportunities for team collaboration in patient care. In one study,<sup>11</sup> it has been found that part of ensuring adequate implementation of shared approaches is clear and open communication. Synchronizing communication strategies (such as regular and structured review meetings designed to develop an agreed approach, and daily team case conferences where patient's medical records are reviewed) into the team's routine helps to create the framework and opportunity for effective and timely team interactions.

### **The patient as the center of decision making**

Given the pluralistic needs of an individual with T2DM – and that those needs vary during the clinical course of a few decades.<sup>11</sup> Thus, health professionals attest to the benefits of patient-centered care. However, they perceived three major seamless barriers to its success even though at the right time and the correct settings. These includes: unstructured healthcare system, lack of

culturally sensitive care, and patients' reluctance to adapt and adhere to health lifestyle. Hence, they mentioned facilitators that includes, policies that support lifestyle changes, culturally-acceptable holistic health awareness programs, and provision of necessary resources. Three studies<sup>13-14,23</sup> from Arab countries included in our review showcased the peculiarity of T2DM multidisciplinary team care in the Arab region. Obesity, poor diet, and physical inactivity are the primary risk factors of T2DM in Arab region. These are fueled by lack of culturally sensitive T2DM multidisciplinary team care and policies do not support lifestyle changes especially physical activity in women.<sup>13-14, 23, 36-38</sup>

Abuyassin B. and Laher I<sup>36</sup> found that the Arab region, particularly the Middle Eastern and North African (*geographically, the region intersects the Arab World and Africa*) region has the second highest rate of increases in diabetes anywhere in the world. In fact, the unavailability of an effective program to defeat T2DM has serious consequences on the increasing rise of this disease, where available data indicates an unusually high prevalence of type 2 diabetes in Arabian children less than 18 years old. In all North African countries, except Sudan, the prevalence T2DM is high in women compared to men, with more discrepancy in Morocco, Tunisia, and Egypt.<sup>37</sup> Valmae Anne Ypinazar and Stephen Andrew Margolis,<sup>38</sup> reported that in the Arabian Gulf there was little in the way of gender differences concerning perceptions of health and illness, both men and women illness beliefs have a strong connection to Islam. However, one area of difference was in visiting the doctor. Most women with T2DM expressed a dislike of attending a primary health care clinic, although they still went, in accordance with the Islamic teachings. While few, dislike because of the modesty required of women in Islam and their discomfort in disclosing their body during physical examinations:

*"I do not like the doctor to see my body, 'harem' [forbidden]."*

Or the length of time they had to wait to see a doctor, stating that at times they could wait 2 to 3 hours. In Oman, doctors and nurses perceived frustration with non-adherent T2DM patients as a barrier to team care. Hence, some doctors mentioned that they expressed aggression towards the non-adherent patients and sometimes they frightened them with the potential complications of diabetes. They even said that they stopped prescribing medicines because these patients did not use them.

*Sometimes I scare the non-cooperative patients otherwise they will not listen. I was aggressive with one ignorant lady and told her in the last visit that to give you the medicine is just a waste of resources. I didn't prescribe any medicine. She was surprised. (D6)<sup>23</sup>*

### **Strengths and limitations of our methods**

As indicated above, the comprehensive and simple search strategy, double screening of titles, abstract and full text ensured that any relevant study that might otherwise have been missed was included. The limitations meant that only one person searched electronic databases and hand-searched available journals. At the stage of full text screening we have identified three implementation studies that have qualitative parts, which are highly relevant to our studies. The studies protocols were published by the authors from University of Queensland, Australia; Teesside University, UK; and University of Warwick, UK. However, we couldn't find the copy of the published qualitative part. We sent an email to the corresponding authors requesting for the published articles. One of the authors, Dr Leah Avery, of Teesside University, UK replied that they haven't yet published their qualitative study findings, but hope to do so towards the end of this year. The other two study's authors have not yet replied to our emails. Therefore, we excluded the three studies at the stage of qualitative synthesis. Based on the risk of bias assessment, majority of the studies (n=12) scored 100% on the CASP qualitative as assessment tool and (n=6) scored 90%. Only one study scores 80%. This attested to the strength of our findings in terms of transferability of our findings to other settings. More so, we did not filter our search strategy with date, language or country. This is to ensure we exhausted available studies. However, only one study in French language was found. It scaled through title and abstract, but we could not screen further because the full text was in French. All health professionals involved the studies we review were working within a multidisciplinary team care in T2DM. Therefore, this review provides an in-depth answer to the phenomenon.

### **Implications for future research**

1. This review includes studies across the globe. Majority of the health professionals involved in the individual studies are general practitioners and nurses while other professionals are underrepresented. This indicate the gap in shared roles among health professionals. Further implementation research is needed to ensure Physiotherapists as physical activity and exercise prescribers in T2DM.
2. Findings from this review revealed the paucity of information regarding the views of health professionals towards multidisciplinary team care in T2DM. This makes it difficult to draw conclusions that could inform social and health care policy. Further research is needed.

3. Health professional's views indicated lack of interprofessional skills. There is need to ascertain their interprofessional collaborative skills, which could help in upskilling of primary care professionals.

## **CONCLUSION**

Health care professionals are an essential drivers of multidisciplinary team care. Their perceptions of what it takes to successfully provide multidisciplinary team care to patients with T2DM have a great influence on their approach to practice. There are variety of integrated diabetic team model, all of which have a common goal, to deliver multidisciplinary team care that is patient-centered. Health professional's perception of successful implementation of team care can be categorize into six major factors namely: working collaboratively to foster supportive relationships; strong committed organizational and team leadership; diversity in expertise, with team members tailored to local circumstances; shared goals and approaches to ensure consistency of message; clear and open communication with the team and with patients; and the patient at the center of decision-making. If established appropriately, these seamless factors were acknowledged by health professionals as beneficial to providing effective multidisciplinary team care in T2DM closer to patient's home. Findings from this review echo the need for health professionals to be cognizant of the varying perceptions of health shared by people from different religious, sociocultural, and linguistic backgrounds to deliver culturally sensitive health care. Arabian Muslim women understood and perceived health and illness with emphasis on the role of Islam in formulating health behaviors. They equate good health with the absence of visible disease. Thus, demonstrating their limited understanding of silent or insidious disease like T2DM.

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