**Comprehensive Diabetes Care, Prevention, and Management: Policy Implications, Implementations and Challenges for the Palestinian Healthcare System**

**כותרת:**

**טיפול, מניעה וניהול כוללני של סכרת: השלכות למדיניות, יישום ואתגרים למערכת הבריאות הפלסטינית**

**Thesis submitted in partial fulfillment**

**of the requirements for the degree of**

**“DOCTOR OF PHILOSOPHY”**

**by**

**first name last name**

**Ahmad Abu Al-Halaweh**

**ID: 983590480**

**Submitted to the Senate of Ben-Gurion University**

**of the Negev**

**04/01/2021**

**Beer-Sheva**

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**Approved by the advisor**

**Approved by the Dean of the Kreitman School of Advanced Graduate Studies**

**04/01/2021**

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This work was carried out under the supervision of

**Professor Nadav Davidovitch**

In the Department: Health Systems Management

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**Research-Student's Affidavit when Submitting the Doctoral Thesis for Judgment**

I, Ahmad Abu Al-Halaweh, whose signature appears below, hereby declare that:

\_√\_\_ I have written this Thesis by myself, except for the help and guidance offered by my Thesis Advisors.

\_√\_\_ The scientific materials included in this Thesis are products of my own research, culled from the period during which I was a research student.

\_√\_\_ This Thesis incorporates research materials produced in cooperation with others, excluding the technical help commonly received during experimental work. Therefore, I am attaching another affidavit stating the contributions made by myself and the other participants in this research, which has been approved by them and submitted with their approval.

Date: 04/01/ 2021

Student's name: Ahmad Abu Al-Halaweh,

Signature:

|  |  |
| --- | --- |
| List of Abbreviations | |
| AVH | **Augusta Victoria Hospital** |
| DCA | **Danish Church Aid** |
| DCCM | **Diabetes Comprehensive Care Model** |
| GDP | **Gross Domestic Product** |
| HbA1c | **Glycated Hemoglobin** |
| IDF | **International Diabetes Federation** |
| LMIC | **Low-Middle Income Countries** |
| MENA | **Middle-East and North Africa** |
| MOH | **Ministry of Health** |
| NCDs | **Non-Communicable Diseases** |
| OOP | **Out of Pocket** |
| PA | **Palestinian Authority** |
| PEN | **Package of Essential Services** |
| PLO | **Palestinian Liberation Organization** |
| PMMS | **Palestinian Military Medical Services** |
| SDGs | **Sustainable Development Goals** |
| UHC | **Universal Health Coverage** |
| UNRWA | **United Nations Relief and Works Agency** |
| USAID | **United States Agency for International Development** |
| WDF | **World Diabetes Foundation** |
| WHO | **World Health Organization** |

Acknowledgments:

(Will be added to the final version)

Table of Contents

[List of Abbreviations iv](#_Toc60692471)

[Acknowledgments: v](#_Toc60692472)

[Abstract 1](#_Toc60692473)

[1 Introduction and Literature Review 12](#_Toc60692474)

[1.1 Goals and Objectives 18](#_Toc60692475)

[1.2 Justification and Anticipated Innovation 19](#_Toc60692476)

[1.3 The Global Picture of Diabetes: 20](#_Toc60692477)

[1.4 The Regional Picture of Diabetes 22](#_Toc60692478)

[1.5 The National Picture of Diabetes 23](#_Toc60692479)

[1.6 Palestinian Healthcare System 25](#_Toc60692480)

[1.6.1 Primary Health Care (PHC) 28](#_Toc60692481)

[1.6.2 Secondary Health Care (Hospitals) 28](#_Toc60692482)

[1.6.3 Health Workforce 29](#_Toc60692483)

[1.6.4 Health Expenditure 30](#_Toc60692484)

[1.7 Diabetes Policies and Management Protocols 31](#_Toc60692485)

[1.8 Diabetes Models in Low Resource Settings 33](#_Toc60692486)

[1.8.1 The Augusta Victoria Diabetes Care Model 35](#_Toc60692487)

[1.9 Theoretical Framework 37](#_Toc60692488)

[1.9.1 The WHO Health System Building Blocks 37](#_Toc60692489)

[1.9.2 Structural Competency 40](#_Toc60692490)

[2 Research Design and Methodology 42](#_Toc60692491)

[2.1 Research Overview 42](#_Toc60692492)

[2.2 Research Paradigm 42](#_Toc60692493)

[2.3 Qualitative Research 43](#_Toc60692494)

[2.3.1 Definition and Related Concepts 44](#_Toc60692495)

[2.3.2 Grounded Theory 44](#_Toc60692496)

[2.3.3 Document Analysis 44](#_Toc60692497)

[2.3.4 Interviews 45](#_Toc60692498)

[2.4 Quantitative Research 47](#_Toc60692499)

[2.5 Ethical Considerations 49](#_Toc60692500)

[3 Results and Discussion 50](#_Toc60692501)

[3.1 Findings and Description of Qualitative Results 50](#_Toc60692502)

[3.2 Findings and Description of Quantitative Results 52](#_Toc60692503)

[3.3 Results and Discussion: Healthcare Providers challenges 56](#_Toc60692504)

[3.3.1 Service Delivery 57](#_Toc60692505)

[3.3.1.1 The Provision of Comprehensive Diabetes Services 57](#_Toc60692506)

[3.3.1.2 Diabetes Guidelines and Management Protocols 60](#_Toc60692507)

[3.3.2 Health Workforce 63](#_Toc60692508)

[3.3.2.1 Shortage of Human Resources and Lack of Specialists 63](#_Toc60692509)

[3.3.2.2 Training and Education 65](#_Toc60692510)

[3.3.2.3 Job Description and Satisfaction 68](#_Toc60692511)

[3.3.3 Medical Products and Technology 70](#_Toc60692512)

[3.3.3.1 Medication, Equipment, and Supplies 70](#_Toc60692513)

[3.3.3.2 Glucometers and Testing Strips 72](#_Toc60692514)

[3.3.4 Health Information 74](#_Toc60692515)

[3.3.4.1 Computers and Electronic Medical Records 74](#_Toc60692516)

[3.3.4.2 Clinical Research 76](#_Toc60692517)

[3.4 Results and Discussion: Workplace Challenges (West Bank vs. Gaza) 80](#_Toc60692518)

[3.4.1 Service Delivery 81](#_Toc60692519)

[3.4.1.1 Access to Comprehensive Diabetes Services 81](#_Toc60692520)

[3.4.1.2 Health Referrals System 85](#_Toc60692521)

[3.4.1.3 The Permit System 86](#_Toc60692522)

[3.4.2 Health Workforce 89](#_Toc60692523)

[3.4.2.1 Implications of Conflict and Political Division on Health Workforce 91](#_Toc60692524)

[3.4.2.2 Implications of Conflict on the Access of the Health Workforce 93](#_Toc60692525)

[3.4.2.3 Implications of Conflict on the Job Satisfaction of the Health Workforce 95](#_Toc60692526)

[3.4.3 Medical Products and Technology 96](#_Toc60692527)

[3.5 Results and discussion: Health Policies, Finance, Leadership and Governance of the Health System 99](#_Toc60692528)

[3.5.1 Health Policies and Strategic Planning 100](#_Toc60692529)

[3.5.2 Financing the Healthcare System 105](#_Toc60692530)

[3.5.2.1 Health Budget and Health Insurance 105](#_Toc60692531)

[3.5.2.2 External Aids 110](#_Toc60692532)

[3.5.3 Leadership and Governance 114](#_Toc60692533)

[3.6 Research Conclusions and Recommendations 119](#_Toc60692534)

[4 bibliography 130](#_Toc60692535)

[5 Annexes 139](#_Toc60692536)

Abstract

**Background:**

Diabetes represents a significant threat to the public health worldwide. It constitutes a critical health and development challenge of the 21st century. The prevalence of diabetes is steadily increasing worldwide, most markedly in the world’s low-resource countries, which account for almost 80% of the total disease burden and 88% of the burden of premature deaths. In Palestine, diabetes prevalence estimates have been difficult to obtain due to the fragmented nature of the Palestinian healthcare system, and the lack of reliable epidemiological studies. Yet, a 2012 study estimated that prevalence in adults 25 years of age and above, was 9.7% in 2000, increasing to 15.3% by 2010. The forecasts are 20.8% for 2020 and 23.4% for 2030.

The Palestinian healthcare system is a fragmented mixture of providers. It operates in a very complex and challenging environment. The current structure of the system, chronic conflict situation, internal division between political factions, territorial divisions between the West Bank and Gaza and within the West Bank area (areas A, B, C, H1, H2 and Jerusalem); in addition to the economic situation and governance, accountability and leadership pose severe challenges to the health sector at all levels of care. The lack of sovereignty and the division of the Palestinian territory has significant implications on the Palestinian economy, including on public revenue and expenditure; and hence, the odds of sustainability of public healthcare provision, with the high rates of public debt, and donor dependency; unquestionably prevail. The current system is incapable of sufficiently addressing the significant challenges presented by the Non-Communicable Diseases (NCDs), and alleviating the burden of diabetes, in addition to encountering other already existing challenges.

There are many innovative and effective models implemented in low-resource setting countries and proved to be successful in diabetes care. There is no single model that fits all aspects of diseases. The WHO has developed the Innovative Care for Chronic Conditions. The framework provides a model for care of the NCDs, which is particularly relevant to primary healthcare settings in low-and middle-income countries. This research and at first-hand experience, proved that the Diabetes Comprehensive Care Model (DCCM) implemented at the Diabetes Care Center in the Augusta Victoria Hospital (AVH) and the partner clinics has positive impacts on diabetes management and care despite the harsh challenging context and environment where it has been operating.

**Goals and Objectives**

This study shows evidences and clear portrait of the actual existing conditions and all related consequences in which the Palestinian healthcare system operates. Therefore, the goal of this research is to present the challenges and to recommend practical and feasible reform agenda to the Palestinian healthcare system and likewise other countries that may encounter similar impediments. The specific objectives of the research are: (1) To describe and better understand the challenges faced by the Palestinian healthcare system in the field of diabetes care at different levels, and from various viewpoints (policymakers, healthcare leaders, and healthcare professionals). (2) To analyze the challenges of diabetes care using the WHO health system framework in order to understand the relationship between the structure of the healthcare system and the context in which it operates. (3) To generate clear, evidence-informed and recommendations for the Palestinian healthcare system reform, based on the findings of this study, successful global models and experiences from other LMIC.

**Methods**

The research is based on the WHO health system building blocks as being the framework and general guide to study, relate and analyze the performance of the existing Palestinian healthcare system with its main six components (1. service delivery, 2. health workforce, 3. medical products and technology, 4 information, 5. financing and 6. leadership and governance). The research employed the mixed methods approach that combines elements from both qualitative and quantitative paradigms. Consequently, actual insights relevant to the structure of the Palestinian healthcare system and how it operates in the field and at all levels of diabetes care; and the context of challenges in which it operates have been successfully and clearly revealed.

1. **Qualitative Research:** The qualitative phase of this study included data collection and analysis from diverse sources. While the main source of data was the use of in-depth semi-structured interviews, additional qualitative data was utilized including document analysis and the grounded theory method. The interview guide contains well prepared questions on the six WHO health systems building blocks. It was reviewed and approved by my research supervisor and research consultants. The design of this study included a purposeful sampling for conducting in-depth, semi-structured, open-ended interviews for 23 healthcare professionals, managers and policymakers within the Palestinian healthcare system. The participants represented a systematic geographical distribution in the West Bank and Gaza that included physicians, nurses and nutritionists from the MOH, UNRWA, and NGOs. Interviews were conducted one-on-one and in the Arabic language after the participants agreed to partake in the study. At the beginning of each interview, the participants were given a full briefing on the purpose of the research, the format of the session and issues of confidentiality. The interviews were recorded, transcribed, translated into English and loaded to "NVivo 12 Pro" software. The data were `1coded based on themes raised form the interviews; and sub-themes were added whenever needed.
2. **Quantitative Research**: In this part of research, the survey questionnaire was built on the themes, sub-themes and other outcomes of the qualitative research, published literature and internationally validated surveys. A "5-level Likert scale" survey (1= strongly disagree, 2= somewhat disagree, 3= neither agree nor disagree, 4= somewhat agree, and 5= strongly agree), was constructed and loaded to the Qualtrics software. The survey contains introduction, demographic information, questions related to the WHO health system building blocks, prioritization to the health system reform, and finally participants were asked to write about any other themes or priorities they wanted to add. The survey was delivered by using Qualtrics software as an anonymous email link and by social media. The survey was active and accessible during the study period from September 2019 until the end of February 2020. After that period and the closure of participation in the survey, data were exported from Qualtrics to the Statistical Package for the Social Sciences (SPSS version 21.0) to perform the statistical analysis. The research has been approved by the ethics committee of the Faculty of Health Sciences in the Ben-Gurion University (BGU) of the Negev.

**Results and Discussion**:

The qualitative interviews involved 23 nurses, physicians and nutritionists representing the MOH, UNRWA and NGOs form the West Bank, Jerusalem and Gaza**.** NVivo 12 Pro software was used to code the main themes and the sub-themes. The quantitative survey involved 392 healthcare professionals who met the inclusion criteria and were included in the analysis. The mean age of participants was 42.88 years (SD=10.788), 51% were females, 31.2% (N=122) were physicians, 50.4% (N=197) work at the MOH system and 28.4% (N=110) were from Gaza Strip. Results of both qualitative and quantitative research were discussed in three chapters:

1. **Health Providers’ Challenges**: The chapter discusses the challenges that face the Palestinian healthcare system due to the fact that there are multiple/duplicate providers. The main challenges discussed are those related to service delivery; health workforce; medical products and technology; and health information. The main provider themes discussed were: challenges related to the provision of comprehensive diabetes services, availability, implementation and unification of diabetes guidelines and management protocols. The shortage of skilled human resources; lack of specialties; training and education; job description and satisfaction were considered urgent disputes that need to be immediately addressed, studied and maintained. The challenges that face providers in terms of medical products and technology were: availability, access and affordability of medications, equipment and supplies, in addition to the scarcity of Glucometers and testing strips. Glucometers and testing strips are not provided by health insurance to diabetes patients which negatively impacted diabetes management and control. As for health information; availability of computers; electronic medical records, and clinical research, they are issues lacking in the health system and in varying degrees among providers. Such important challenges need to be seriously considered and be prioritized into active solutions.
2. **Workplace Challenges (West Bank vs. Gaza):** This chapter discusses and analyzes the fragmentation of the Palestinian healthcare system and diabetes care due to different geographic barriers to the Palestinian healthcare system in Gaza and the West Bank. The geographical divisions aggravated by the political conditions have produced two separate *de facto* government health systems, one for Gaza and the other for the West Bank. It has entrenched both physical and administrative divisions of the Palestinian territory and population. The situation on the ground has led to the near impossibility of unifying and standardizing the two geographically isolated health sectors, creating redundancy in positions and bureaucracy, and widening the already existing gap between the two regions. The intensified siege and closure of the Gaza Strip and territory that is divided administratively into Areas A, B, C, H1, H2 in the West Bank and East Jerusalem, has complicated the reform efforts; and the uncertainty about future developments, imposed by a fruitless peace process, aggravate the situation further. The territorial division and physical separation of Palestinian communities in the West Bank and Gaza pose major barriers to free movement and significant implications for the provision of services, and impact on the lack of sustainability of the Palestinian healthcare system. The challenges regarding access to comprehensive diabetes services have created further challenges represented in the health referrals system, and a corrupted bureaucratic system of permits. As for the health workforce; many challenges have been identified on the implications of conflict and political division on health workforce; implications of conflict on the access of the health workforce; and implications of conflict on the job satisfaction of the health workforce. On the other hand, chronic shortage of pharmaceuticals, supplies, spare parts and gaps in general maintenance led to further challenges for sustaining the quality of services in Gaza Strip and to a lesser extent in the West Bank**.**
3. **Health Policies, Finance, Leadership and Governance of the Health System:** The effects of the unstable and ambiguous political environment, violent conflict and consequent economic instability on health system, and the formulation of health-related policies are profound. The lack of sovereignty, control over borders and resources, and high dependency on the external aids; the absence of a long-term Palestinian development agenda focusing on sustainable and equitable growth has undermined any strategic planning.Lack of sovereignty and effective control over natural resources or other potential sources of revenue hamper the ability of the Palestinian Authority to adequately finance public healthcare and fulfill these duties towards the Palestinian population in the West Bank and Gaza. International assistance is profoundly political, and its continuity largely depends on the peace progress**.** The assistance provided by donor community, which is described by the World Bank as highly fragmented community itself. Many donations are based on bilateral deals that suit the donors’ political guidelines and preferences over the Palestinians real requirements**.** The political division between the West Bank and Gaza has resulted in the creation of two separate governance structures with separate visions and strategies for the development of the sector. The MOH in Gaza regulates the sector directly, involving little communication with the MOH located in the West Bank; the MOH departments are duplicated and administered by different personnel. There is little coordination and cooperation between the government, UNRWA, private and NGO sectors. This detachment results in a system where the MOH is steward of the public system only rather than the entire sector. The Palestinian Authority in general, is facing a growing legitimacy crisis. Weak oversight, bribery, embezzlement, nepotism, and other forms of corruption are rampant in social services such as health care. This situation is very dangerous and threatens a potential collapse of the health system**.**

**Conclusion and Recommendations**

Almost all participants have mentioned issues related to strengthening the primary health care system. They prioritize the following: Capacity Building**,** Universal Health Coverage**,** Investment in Primary Healthcare**,** The Need for Health Legislations**;** Unification of Diabetes Management Protocol**;** Provision of New Medications in the Clinics**;** adopting strategies of task shifting/sharing in the PHC**;** andthe importance of the adoption of a system for incentives that lead to more job satisfaction**.** The function, structure and the reform of the Palestinian healthcare system are linked to, and highly dependent on, the future political scenarios of peace between Israel and the Palestinians and the reconciliation between the Palestinian political factions**.** Strategies and recommendations for strengthening respect, protection and fulfilment of the right, to the highest attainable standard of physical and mental health for Palestinians in the Palestinian territory, have been put forward for execution by the special rapporteur; and verified by this research on the situation of human rights in the Palestinian territories**.** The introduced specific recommendations regarding the tailored six WHO building blocks for the Palestinian healthcare systems, and the indispensable actions to move forward for the best interest of Palestineand other countries with similar obstacles have been hereby initiated and documented as a road map for immediate implementation.

**תַקצִיר**

**רקע:**

סוכרת מהווה איום משמעותי על בריאות הציבור ברחבי העולם. זה מהווה אתגר בריאותי ופיתוח קריטי של המאה ה -21. שכיחות הסוכרת גוברת בהתמדה ברחבי העולם, באופן בולט ביותר במדינות בעלות המשאבים הנמוכים בעולם, המהוות כמעט 80% מסך נטל המחלות ו -88% מהנטל של מקרי מוות בטרם עת. בפלסטין, קשה היה להשיג אומדני שכיחות סוכרת בגלל האופי המקוטע של מערכת הבריאות הפלסטינית, והיעדר מחקרים אפידמיולוגיים אמינים. עם זאת, מחקר שנערך בשנת 2012 העריך כי השכיחות בקרב מבוגרים בני 25 ומעלה הייתה 9.7% בשנת 2000, ועלתה ל- 15.3% עד 2010. התחזיות הן 20.8% לשנת 2020 ו- 23.4% לשנת 2030.

מערכת הבריאות הפלסטינית היא תערובת מקוטעת של ספקים. הוא פועל בסביבה מורכבת ומאתגרת מאוד. המבנה הנוכחי של המערכת, מצב סכסוך כרוני, חלוקה פנימית בין פלגים פוליטיים, פילוגים טריטוריאליים בין הגדה המערבית לעזה ובתוך אזור הגדה (שטחים A, B, C, H1, H2 וירושלים); בנוסף למצב הכלכלי ולמשילות, אחריות ומנהיגות מהווים אתגרים חמורים למגזר הבריאות בכל רמות הטיפול. לחוסר הריבונות ולחלוקת השטח הפלסטיני השלכות משמעותיות על הכלכלה הפלסטינית, כולל על הכנסות והוצאות ציבוריות; ומכאן, הסיכויים לקיימות של מתן שירותי בריאות ציבוריים, עם שיעורי החוב הציבוריים הגבוהים, ותלות התורמים; ללא ספק שוררים. המערכת הנוכחית אינה מסוגלת להתמודד במידה מספקת עם האתגרים המשמעותיים שמציבות המחלות הלא-מדבקות (NCDs), ולהקל על נטל הסוכרת, בנוסף להיתקל באתגרים אחרים שכבר קיימים.

ישנם מודלים חדשניים ויעילים רבים המיושמים במדינות בעלות משאבים נמוכים והוכחו כמוצלחים בטיפול בסוכרת. אין מודל אחד שמתאים לכל היבטי המחלות. ארגון הבריאות העולמי פיתח את הטיפול החדשני למצבים כרוניים. המסגרת מספקת מודל לטיפול ב- NCDs, הרלוונטי במיוחד למסגרות בריאות ראשוניות במדינות בעלות הכנסה נמוכה ובינונית. מחקר זה ומניסיון ממקור ראשון הוכיחו כי למודל הטיפול המקיף לסוכרת המיושם במרכז לטיפול בסוכרת בבית החולים אוגוסטה ויקטוריה ובמרפאות השותפות יש השפעות חיוביות על ניהול והטיפול בסוכרת למרות ההקשר המאתגר הקשה. והסביבה בה היא פעלה.

**מטרות ויעדים:**

מחקר זה מהווה אבן פינה המציגה ראיות ודיוקן ברור של התנאים הקיימים בפועל וכל ההשלכות הנלוות בהן פועלת מערכת הבריאות הפלסטינית. לכן, מטרת המחקר היא להציג את האתגרים ולהמליץ על סדר היום הרפורמי המעשי והניתן לביצוע למערכת הבריאות הפלסטינית וכמו כן מדינות אחרות העשויות להיתקל במניעות דומות. המטרות הספציפיות של המחקר הן: 1) לתאר ולהבין טוב יותר את האתגרים העומדים בפני מערכת הבריאות הפלסטינית בתחום הטיפול בסוכרת ברמות שונות ומנקודות מבט שונות (קובעי מדיניות, מובילי דעה ואנשי מקצוע בתחום הבריאות). 2) לחקור את האתגרים של טיפול בסוכרת ולהבין את הקשר בין המבנה של מערכת הבריאות לבין ההקשר שבו היא פועלת זאת באמצעות מסגרת ניתוח של ארגון הבריאות העולמי. 3) לגבש המלצות ברורות לגבי מערכות הבריאות הפלסטיניות, המבוססות על ממצאי מחקר זה ומודלים גלובליים מוצלחים מתוך נסיון של מדינות אחרות בעלות משאבים מוגבלים.

**מתודולוגיה:**

המחקר מבוסס על אבני הבניין של מערכת הבריאות של ארגון הבריאות העולמי כמסגרת והמדריך הכללי לחקר, התייחסות וניתוח הביצועים של מערכת הבריאות הפלסטינית הקיימת על ששת מרכיביה העיקריים: (1. אספקת שירותים, 2. כוח אדם בתחום הבריאות, 3. מוצרים וטכנולוגיה רפואית, 4 מידע, 5. מימון ו- 6. מנהיגות וממשל). המחקר השתמש בגישת השיטות המעורבות המשלבת אלמנטים מפרדיגמות איכותיות וכמותיות כאחד. כתוצאה מכך, תובנות ממשיות הרלוונטיות למבנה מערכת הבריאות הפלסטינית ולאופן פעולתה בשטח ובכל רמות הטיפול בסוכרת; והקשר האתגרים בו הוא פועל נחשף בהצלחה וברורה.

1. **מחקר איכותני:** השלב האיכותני של מחקר זה כלל איסוף נתונים וניתוחם ממקורות מגוונים. בעוד שמקור הנתונים העיקרי היה השימוש בראיונות מעמיקים למחצה מעמיקים, נעשה שימוש בנתונים איכותניים נוספים, כולל ניתוח מסמכים ושיטת התיאוריה המבוססת. מדריך הראיונות מכיל שאלות מוכנות היטב על שש אבני הבניין של מערכות הבריאות של ארגון הבריאות העולמי. זה נבדק ואושר על ידי מפקח המחקר שלי ויועצי המחקר שלי. תכנון מחקר זה כלל דגימה תכליתית לביצוע ראיונות עומק, חצי-מובנים ופתוחים, עבור 23 אנשי מקצוע בתחום הבריאות, מנהלים וקובעי מדיניות במערכת הבריאות הפלסטינית. המשתתפים ייצגו תפוצה גיאוגרפית שיטתית בגדה המערבית ובעזה שכללה רופאים, אחיות ותזונאים ממשרד הבריאות, אונר"א וארגונים לא ממשלתיים. הראיונות נערכו אחד על אחד ובשפה הערבית לאחר שהמשתתפים הסכימו להשתתף במחקר. בתחילת כל ראיון, המשתתפים קיבלו תדרוך מלא אודות מטרת המחקר, מתכונת המפגש ונושאי סודיות. הראיונות הוקלטו, תועתקו, תורגמו לאנגלית והועמסו לתוכנת "NVivo 12 Pro". הנתונים קודדו על פי נושאים שהועלו מהראיונות; ונושאי משנה נוספו בכל צורך.
2. **מחקר כמותי:** בחלק זה של המחקר, שאלון הסקר נבנה על פי הנושאים, תתי הנושאים ותוצאות אחרות של המחקר האיכותני, ספרות שפורסמה וסקרים מאומתים בינלאומיים. סקר "סולם ליקרט ברמה 5" (1 = לא מסכים מאוד, 2 = לא מסכים, 3 = לא מסכים ולא מסכים, 4 = מסכים במידה מסוימת, ו- 5 = מסכים לחלוטין), נבנה והועלה לתוכנת Qualtrics. הסקר מכיל מבוא, מידע דמוגרפי, שאלות הקשורות לאבני הבניין של מערכת הבריאות של ארגון הבריאות העולמי, עדיפות לרפורמה במערכת הבריאות, ולבסוף המשתתפים התבקשו לכתוב על כל נושא או סדרי עדיפויות אחרים שהם רוצים להוסיף. הסקר הועבר באמצעות תוכנת Qualtrics כקישור דוא"ל אנונימי ועל ידי מדיה חברתית. הסקר היה פעיל ונגיש במהלך תקופת המחקר מספטמבר 2019 ועד סוף פברואר 2020. לאחר אותה תקופה וסגירת ההשתתפות בסקר, הנתונים יוצאו מקוולטריקס לחבילה הסטטיסטית למדעי החברה (גרסת SPSS 21.0) לביצוע הניתוח הסטטיסטי. המחקר אושר על ידי ועדת האתיקה של הפקולטה למדעי הבריאות באוניברסיטת בן-גוריון בנגב.

**תוצאות ודיון:** בראיונות האיכותניים השתתפו 23 אחיות, רופאים ותזונאים המייצגים את משרד הבריאות, אונר"א וארגונים לא ממשלתיים משטחים פלסטיניים, ירושלים ועזה. תוכנת NVivo 12 Pro שימשה לקידוד הנושאים העיקריים ותתי הנושאים. בסקר הכמותי השתתפו 392 אנשי מקצוע בתחום הבריאות שעמדו בקריטריונים להכללה ונכללו בניתוח. הגיל הממוצע של המשתתפים היה 42.88 שנים (SD = 10.788), 51% היו נשים, 31.2% (N = 122) היו רופאים, 50.4% (N = 197) עבדו במערכת משרד הבריאות ו- 28.4% (N = 110). מרצועת עזה. תוצאות המחקר האיכותי והכמותי נדונו בשלושה פרקים:

**פרק 1: אתגרי ספקי הבריאות:** הפרק דן באתגרים העומדים בפני מערכת הבריאות הפלסטינית בשל העובדה שישנם ספקים מרובים / כפולים. האתגרים העיקריים הנידונים הם אלה הקשורים לאספקת שירות; כוח אדם בתחום הבריאות; מוצרים וטכנולוגיה רפואיים; ומידע בריאותי. נושאי הספק העיקריים שנדונו היו: אתגרים הקשורים במתן שירותי סוכרת מקיפים, זמינות, יישום ואיחוד של הנחיות לסוכרת ופרוטוקולי ניהול. המחסור במשאבי אנוש מיומנים; היעדר התמחויות; הכשרה וחינוך; תיאור התפקיד וסיפוקו נחשבו לסכסוכים דחופים שיש לטפל בהם באופן מיידי, ללמוד ולשמר אותם. האתגרים העומדים בפני ספקים במונחים של מוצרים וטכנולוגיה רפואיים היו: זמינות, נגישות ומשתלמות של תרופות, ציוד וציוד, בנוסף למחסור בגלוקומטרים ורצועות הבדיקה. גלוקומטרים ורצועות בדיקה אינם ניתנים על ידי ביטוח בריאות לחולי סוכרת שהשפיעו לרעה על ניהול ובקרת הסוכרת. באשר למידע בריאותי; זמינות מחשבים; רשומות רפואיות אלקטרוניות ומחקרים קליניים, הם נושאים חסרים במערכת הבריאות ובדרגות שונות בקרב הספקים. יש לשקול ברצינות אתגרים חשובים כאלה ולהעדיף אותם לפתרונות פעילים.

**פרק 2: אתגרים במקום העבודה (****שטחים לעומת עזה):** פרק זה דן ומנתח את הפיצול של מערכת הבריאות הפלסטינית וטיפול בסוכרת עקב חסמים גיאוגרפיים שונים למערכת הבריאות הפלסטינית בעזה ובשטחים. החלוקה הגאוגרפית שהוחמרה בתנאים הפוליטיים ייצרה שתי מערכות בריאות ממשלתיות נפרדות, האחת לעזה והשנייה לשטחים. היא חרטה את החלוקה הפיזית והמנהלית הן בשטח ובאוכלוסיה הפלסטינית. המצב בשטח הביא לחוסר אפשרות כמעט לאחד ולתקן את שני מגזרי הבריאות המבודדים מבחינה גיאוגרפית, ליצור יתירות בעמדות ובבירוקרטיה, ולהרחיב את הפער הקיים כבר בין שני האזורים. המצור והסגירה המוגברים של רצועת עזה והשטח המחולקים מנהלית לאזורים A, B, C, H1, H2 בשטחים ובמזרח ירושלים, סיבכו את מאמצי הרפורמה; ואי הוודאות לגבי ההתפתחויות העתידיות, המוטלות על ידי תהליך שלום חסר תועלת, מחמירות את המצב עוד יותר. החלוקה הטריטוריאלית וההפרדה הפיזית של קהילות פלסטיניות בשטחים ובעזה מהווים חסמים גדולים לתנועה חופשית והשלכות משמעותיות על מתן השירותים, והשפעה על חוסר הקיימות של מערכת הבריאות הפלסטינית. האתגרים הנוגעים לגישה לשירותי סוכרת מקיפים יצרו אתגרים נוספים המיוצגים במערכת הפניות הבריאות, ומערכת היתרים ביורוקרטית מושחתת. באשר לכוח העבודה הבריאותי; זוהו אתגרים רבים על ההשלכות של סכסוך וחלוקה פוליטית על כוח האדם בתחום הבריאות; השלכות של סכסוך על הגישה של כוח האדם בתחום הבריאות; והשלכות של סכסוך על שביעות הרצון של כוח האדם בבריאות. מנגד, מחסור כרוני בתרופות, אספקה, חלקי חילוף ופערים בתחזוקה כללית הביא לאתגרים נוספים לקיום איכות השירותים ברצועת עזה ובמידה פחותה בשטחים.

**פרק 3: מדיניות בריאות, מימון, מנהיגות וממשל של מערכת הבריאות:** ההשפעות של הסביבה הפוליטית הבלתי יציבה והמעורפלת, הסכסוך האלים והיציבות הכלכלית הנובעת מכך על מערכת הבריאות וגיבוש המדיניות הקשורה לבריאות הן עמוקות. היעדר ריבונות, שליטה בגבולות ומשאבים ותלות גבוהה בעזרים החיצוניים; היעדר סדר יום פיתוח פלסטיני ארוך טווח המתמקד בצמיחה בת קיימא ושוויונית, ערער כל תכנון אסטרטגי. היעדר ריבונות ושליטה אפקטיבית במשאבי הטבע או במקורות הכנסה פוטנציאליים אחרים, פוגעים ביכולתה של הרשות הפלסטינית לממן כראוי את שירותי הבריאות הציבוריים ולמלא חובות אלה כלפי האוכלוסייה הפלסטינית בשטחים ובעזה. הסיוע הבינלאומי הוא פוליטי באופן עמוק, והמשכיותו תלויה במידה רבה בהתקדמות השלום. הסיוע הניתן על ידי קהילת התורמים, המתוארת על ידי הבנק העולמי כקהילה מקוטעת מאוד עצמה. תרומות רבות מבוססות על עסקאות דו צדדיות המתאימות להנחיות המדיניות ולהעדפות התורמים על פני הדרישות האמיתיות של הפלסטינים. החלוקה הפוליטית בין שטחים לעזה הביאה ליצירת שני מבני ממשל נפרדים עם חזונות נפרדים ואסטרטגיות להתפתחות המגזר. משרד הבריאות בעזה מסדיר את המגזר באופן ישיר, כרוך בתקשורת מועטה עם משרד הבריאות הממוקם בשטחים; מחלקות משרד הבריאות משוכפלות ומנוהלות על ידי אנשי צוות שונים. אין מעט תיאום ושיתוף פעולה בין המגזר הממשלתי, אונר"א, הפרטי והארגונים הלא ממשלתיים. התנתקות זו מביאה למערכת בה משרד הבריאות הוא מנהיג המערכת הציבורית רק במקום המגזר כולו. הרשות הפלסטינית בכלל עומדת בפני משבר לגיטימציה הולך וגובר. פיקוח חלש, שוחד, מעילה, נפוטיזם וצורות אחרות של שחיתות משתוללים בשירותים חברתיים כמו שירותי בריאות. מצב זה מסוכן מאוד ומאיים על קריסה אפשרית של מערכת הבריאות.

**מסקנה והמלצות:**

כמעט כל המשתתפים ציינו נושאים הקשורים לחיזוק מערכת הבריאות הראשונית. הם מעדיפים את הדברים הבאים: בניית יכולות, כיסוי בריאות אוניברסלי, השקעה בבריאות ראשונית, הצורך בחקיקות בריאות; איחוד פרוטוקול ניהול סוכרת; מתן תרופות חדשות במרפאות; אימוץ אסטרטגיות של שינוי / שיתוף משימות בטיפול הבריאותי הראשוני; והחשיבות של אימוץ מערכת תמריצים שמובילה ליותר שביעות רצון מהעבודה. הפונקציה, המבנה והרפורמה במערכת הבריאות הפלסטינית קשורים, ותלויים מאוד בתרחישים הפוליטיים העתידיים של שלום בין ישראל לפלסטינים והפיוס בין הפלגים הפוליטיים הפלסטינים. אסטרטגיות והמלצות לחיזוק הכבוד, ההגנה וההגשמה של הזכות, בסטנדרט הגבוה ביותר של הבריאות הגופנית והנפשית שניתן להשיג לפלסטינים בשטח הפלסטיני, הועלו על ידי הדו"ח המיוחד; ואומתה על ידי מחקר זה על מצב זכויות האדם בשטחים הפלסטיניים. ההמלצות הספציפיות שהוכנסו בנוגע לשש אבני הבניין המותאמות של ארגון הבריאות העולמי למערכות הבריאות הפלסטיניות, והפעולות החיוניות להתקדם לטובת פלסטין ומדינות אחרות עם מכשולים דומים, יזמו ותועדו בזאת כמפת דרך ליישום מיידי.

**Key Words:**

**WHO Health Systems Building Blocks; Service Delivery; Health Workforce; Information; Medical supplies and Technology, Financing; Leadership and Governance; Palestinian Healthcare System; Policies and Legislations; Diabetes Prevalence; Diabetes Care; Diabetes Services; Health System Reform**

**מילות מפתח:**

**אבני בניין של מערכות ארגון הבריאות העולמי; אספקת שירות, כוח אדם בתחום הבריאות; מֵידָע; ציוד רפואי וטכנולוגיה, מימון, מנהיגות וממשל; מערכת הבריאות הפלסטינית; מדיניות וחקיקה; שכיחות סוכרת; טיפול בסוכרת; שירותי סוכרת; רפורמה במערכת הבריאות**

# Introduction and Literature Review

Diabetes represents a significant threat to the public health worldwide. It constitutes a critical health and development challenge of the 21st century. The prevalence of diabetes is steadily increasing worldwide, most markedly in the world’s low-resource countries, which account for almost 80% of the total disease burden and 88% of the burden of premature deaths [1]. The International Diabetes Federation (IDF) estimated 463.0 million adults aged 20–79 years worldwide (9.3% of all adults in this age group) have diabetes [2]. It is estimated that 79.4% live in low-and middle-income countries. Based on the 2019 estimates, by 2030 a projected 578.4 million (10.2%), and by 2045, 700.2 million (10.9%) adults aged 20–79 years, will be living with diabetes [2]. In addition, The IDF has estimated that as many as 193 million people, or close to half (46.5%) of all individuals with diabetes, are unaware of their disease. The majority of countries spend between 5% and 20% of their total health expenditure on diabetes [3]. With such a high cost, the disease is a significant challenge for healthcare systems and an obstacle to sustainable economic development. Diabetes is estimated to contribute to one in nine deaths among adults aged 20–79 years. An estimated 4.2 million deaths among 20–79-year-old adults are attributable to diabetes. Diabetes is estimated to contribute to 11.3% of deaths globally, ranging from 6.8% (lowest) in the Africa Region to 16.2% (highest) in the Middle East and North Africa (MENA) [4].

According to the latest IDF statistics [2], the MENA region has the highest age-adjusted comparative prevalence of diabetes in people aged 20–79 years in 2019, 2030 and 2045 (12.2%, 13.3% and 13.9% respectively). Approximately 54.8 million (30.7–75.1 million) people, or 12.2% (8.3–16.1%) of adults aged 20-79, were living with diabetes in 2019. Over 44.7% (24.5 million) of these were undiagnosed. An additional 35.5 million people in the region, or 9.2% of the adult population, are estimated to have impaired glucose tolerance, and are therefore at high risk of developing diabetes. It is estimated that the number of people with diabetes in the region will double to 72.1 million by 2040 [5].

The World Bank classifies Palestine as a lower middle-income country [6]. The healthcare systems in low-resource countries usually described as fragile and vulnerable systems [7]. They cannot meet everyone’s needs, especially those with chronic conditions such as diabetes. A variety of challenges exist regarding the organization of the healthcare system including: political instability, weak leadership, lack of human resources and trained teams, insufficient information to support decision-making, inability to afford the supply medicines; and the unavailability of sustainable financial systems that lack essential health policies and legislations causing heavy burdens on the provision of health care [8]. Additionally, economic difficulties encountered by many patients with diabetes in the developing world have to challenge the access, availability, affordability of medications and medical supplies; medical examination fees, transportation to medical venues; and even purchasing such basic medications or other necessary human needs like food or clothes do pose very difficult challenges of hardships [9].

In Palestine, diabetes prevalence estimates have been difficult to obtain due to the fragmented nature of the Palestinian healthcare system, and the lack of reliable epidemiological studies [10]. The International Diabetes Federation (IDF) has reported the prevalence of diabetes to be 9.5% in the age group 20–79 years [2]. Yet, a 2012 study estimated that prevalence in adults 25 years of age and above, was 9.7% in 2000, increasing to 15.3% by 2010. The forecasts are 20.8% for 2020 and 23.4% for 2030 representing a predicted increase of 35% from 2000 to 2030 [11]. Diabetes complications are predicted to be high due to poor glycemic control and huge challenges in healthcare delivery.

The Palestinian healthcare system is a fragmented mixture of providers: namely, the Palestinian Ministry of Health (MOH); the United Nations Relief and Works Agency (UNRWA); the Palestinian Non-Governmental Organizations (NGOs); the Palestinian Military Medical Services (PMMS), and the private sector [12]. Also, the Israeli healthcare networks provide services to Palestinians residing in East Jerusalem, and to only to those who hold and maintain the restrictions of the Israeli residency status [10]. The MOH is the responsible national institution for leading and regulating the functioning of the health sector and ensuring the necessary resources for its sustainability and development in response to the changing and increasing needs of the entire population. The MOH functions and responsibilities include delivery of the government’s preventive, diagnostic, curative and rehabilitative health services; regulation of the health sector functioning to ensure high level of harmonized and integrated work between the different service providers and sectors; development of national health regulations, laws and policies; and reinforcement of the health financing system and optimal investment of the available resources [13]. The UNRWA was created in 1949 and it was a key provider of health and education services in Palestine. It served registered Palestinian refugees inside and outside Palestine. UNRWA’s main contribution is in the primary health care, however, it depends on resources from the government, private and NGO sources in order to provide the secondary health care services. The UNRWA either partially reimburses hospitals for treated cases, or negotiates contracts with the government, NGOs and private hospitals [14]. The UNRWA provides health services for 5.8 million Palestine refugees who are registered across its five fields of operation – the West Bank, Gaza, Syria, Lebanon, and Jordan through a network of 143 healthcare centers [15]. The UNRWA was able to develop its own system of basic services, for the refugees relatively independently. However, with the highly centralized administration in Vienna, the bureaucratic structure did not foster Palestinian capacity building and leadership at the top echelon [16]. The NGOs were the first actors to provide health services in Palestine. They started as charitable organizations. After the establishment of the Palestinian National Authority, NGOs continued to be a major health service provider however; they did so under the new MOH. They cover the shortages and gaps of the MOH, especially in poorly accessible areas. These areas are more easily accessed by NGOs as they have better outreach to Area C and East Jerusalem [14]. The NGOs’ healthcare system lost the vast majority of its resources when it channeled funds through the Palestinian Authority system.

The political division due to the internal Palestinian conflict and the de-development of healthcare system in Gaza, further intensifies the difficulties [17]. The physical and administrative division of the West Bank additionally amalgamates its geographical separation from the Gaza Strip. The West Bank has been administratively split into Areas A, B and C under the Oslo Accords since the early-mid of 1990 [18]. Area C and H2 are under direct Israeli civil and military control, with Area A and H1 under Palestinian civil and security control; and Area B under Palestinian civil and Israeli military control. The territorial division and physical separation of the Palestinian communities in the West Bank and Gaza pose major barriers to free movement and significant implications for the provision of services and impact on the lack of sustainability of the Palestinian healthcare system [19]. Since the political turmoil between the biggest two Palestinian factions, Fatah and Hamas in 2007, Hamas operates Gaza government, and Fatah runs the West Bank. The Palestinians ended up having two health ministries, with a very complicated referral system between WB and Gaza. The majority of advanced treatments are not available in Gaza; cases that require advanced management are referred to East Jerusalem hospitals or specialized hospitals in the West Bank. The Palestinian Legislative Council, which is the formal body to pass all legislation, was suspended after the internal political division in 2007. Urgently-needed legislation can now only be achieved through a Presidential Order. Closed borders between Gaza and Israel, and Gaza and Egypt, as well as the three wars between Hamas and Israel and subsequent measures like closure, electricity, water and poverty, threaten to collapse the Palestinian healthcare system [20][21]. The Palestinian Authority has no sovereignty in its decision-making and no real authority on the ground to build, develop and sustain the national healthcare system. The PA is facing a growing legitimacy crisis, with 80% of Palestinians reporting the belief that PA institutions are corrupt, and more than half (53%) reporting that the PA has become a burden on the Palestinian people [22]. Weak oversight, bribery, embezzlement, nepotism, and other forms of corruption are rampant in social services such as health care. This corruption does not end at the state level and has resulted in a very fragile and corrupt system responsible for extensive suffering and disparities in treatment [22]. It does not preserve health as fundamental and essential right for the Palestinian community, or act as an integral component in state-building. The current system is incapable of sufficiently addressing the significant challenges presented by NCDs and alleviating the burden of diabetes, in addition to the other challenges it already has. The lack of sovereignty and the division of the Palestinian territory has significant implications to the Palestinian economy, including public revenue and expenditure, and hence the sustainability of public healthcare provision, with high rates of public debt and donor dependency [18].

The blockade on Gaza has led to worse health outcomes there than in the West Bank, as well as a lower proportion of hospital beds, nurses, and doctors. Many medical shortages in Gaza have little to do with the lack of available resources and are instead a direct result of political factors [22]. For example, outside of a limited amount of food or other humanitarian necessities, Israel generally does not allow the importation of concrete or other materials required to rebuild damaged infrastructure at medical facilities that were destroyed during the last violent confrontations between Israel and Hamas. The entry of humanitarian and medical supplies is restricted by Israel’s "dual use" list of equipment, machines and supplies. "Dual use" items include medical equipment and supplies such as nuclear scanning technology; and materials used in treatments or prostheses. The list includes as well important items and spare parts needed for the maintenance of medical equipment [18].

It is undeniable that a healthcare system cannot be implicit without understanding the context in which it operates. A healthcare system does not operate in a vacuum. It is influenced by the political, religious, socioeconomic, and cultural context within which it is situated [23]. The development of health policy is a dialectic process between the policy process itself and the environment in which it takes place. An understanding of the policy context is critical to policy analysis, and contributes to policy-making in different ways. It recognizes that health requires a whole-of-government and whole-of-society approach, in which all sectors systematically consider the health impact of policies on trade, agriculture, finance, transport, education and urban planning; because health is enhanced or obstructed as a result of policies in these and other areas [1].

The development of diabetes models specifically designed to promote diabetes prevention and deal with high burden of diabetes in LMIC, where the majority of individuals with diabetes live, is highly needed. There are many innovative and effective models implemented in low-resource setting countries and proved successful in diabetes care. The WHO has developed the Innovative Care for Chronic Conditions [24]. The framework provides a model for care of NCDs, which is particularly relevant to primary health-care settings in low-and middle-income countries. The framework intends to present health-care solutions for effective management of long-term health problems. Patients and families, health-care teams and community partners are centered as a triad in the framework so that all parties are timely informed, motivated and prepared to manage chronic conditions. It also helps in taking action by using ‘building blocks’ at each level. The model tries to comprehensively understand the situation at these multi-levels in order to take action, which is useful for investigating access to chronic NCD care. It is crucial to study such innovative models and adopt principles that define their success for possible implementation in other countries with similar healthcare challenges [8] [25] [26]. As part of its contribution to improve diabetes care services in the Palestinian territories, and to promote the provision of quality diabetes services within the Palestinian healthcare system, Augusta Victoria Hospital (AVH) adopted and successfully implemented the Diabetes Comprehensive Care Model (DCCM) in its main center in Jerusalem [10]. The model provides an alternative approach to the currently prevailed biomedical approach to diabetes treatment in the Palestinian healthcare system (i.e., physician-centered, focused on prescription of medications). The DCCM involves a modification of the existing treatment procedures and a unification of best practices into a protocol and a holistic approach to diabetes care focused on the whole person, which takes into consideration and is oriented to the local context and focus in Palestine. This bottom-up approach also requires community support and involvement at a high level of awareness and prevention of diabetes. The DCCM ushers in a new, innovative approach where the patient plays a central and active role in the diabetes care plan [12]. The MOH and UNRWA, the main two providers of diabetes care, have agreed to adopt and gradually implement the DCCM within their health systems.

This research will use the six building blocks of the WHO framework (Service delivery, healthcare workforce, information, medical products, vaccines and technologies, financing and leadership and governance) to assess, describe and analyze the challenges facing diabetes care and prevention in Palestine at all levels of care. It will elucidate the impacts of, and on, the fragile and fragmented healthcare system on the provision of diabetes care. The results of this research will provide insights and recommendations that can help in the reform of the Palestinian healthcare system at large.

## Goals and Objectives

Low-income countries (LIC) and lower middle-income countries (LMIC) are facing an epidemiological transition, with increases in the prevalence and mortality related to non- communicable diseases particularly diabetes. These transitional patterns have close links to globalization, urbanization, and changes in the economic, social, and demographic profiles of these countries. Diabetes represents a significant threat to the public health worldwide. It constitutes a critical health and development challenge of the 21st century. The prevalence of diabetes is steadily increasing worldwide, most markedly in the world’s low-resource countries. Like the majority of healthcare systems in low-resource countries, the Palestinian healthcare system is fragmented and operates in a very complex and challenging environment where diabetes is considered a severe problem that puts many big challenges before the healthcare system. Its prevalence is steadily increasing, adding a significant burden on patients, the healthcare system, communities, and the national budget. It is evident that the Palestinian healthcare system faces significant challenges at all levels of care that affect its effectiveness and the ability to cope with the magnitude of the challenges it faces. Empirical evidences for a weak and fragmented healthcare system, that faces significant challenges and inequalities in diabetes care within the Palestinian healthcare system probably will be the same as previously shown in other studies conducted in the LMICs. The research speculates that the use of the WHO health systems building blocks framework to study the current diabetes care system in Palestine, analyze it, and compare the findings of our research with results and evidences from other international models proved to be effective and efficient somewhere else in the world and within the context of LMICs. This could help to inspire the restructure of the current healthcare system, and to come up with specific and evidence-based recommendations that could strategically guide the future reform of such fragmented system. Regional and global healthcare systems operate within the context of low-resource settings could benefit from the experience of the Palestinian health system reform.

This study shows evidences and clear portrait of the actual existing conditions and all related consequences in which the Palestinian healthcare system operates. Therefore, the goal of this research is to present the challenges and to recommend practical and feasible reform agenda to the Palestinian healthcare system and likewise other countries that may encounter similar impediments, mainly in the LMICs. The specific objectives of the research are:

* To describe and better understand the challenges faced by the Palestinian healthcare system in the field of diabetes care at different levels, and from various viewpoints (policymakers, healthcare leaders, and healthcare professionals).
* To analyze the challenges of diabetes care using the WHO health system framework in order to understand the relationship between the structure of the healthcare system and the context in which it operates.
* To generate clear, evidence-informed and recommendations for the Palestinian healthcare system reform, based on the findings of this study, successful global models and experiences from other LMIC.

## Justification and Anticipated Innovation

Diabetes is considered to be a challenge to all healthcare systems globally, in the region, and to the national healthcare systems. The Palestinian healthcare system, in particular, faces additional challenges related to the prevailed chronic conflict, political situation, occupation, division between major political factions and system fragmentation, which increase patients’ suffering and leads to a high rate of uncontrolled and complicated diabetes cases. The prevalence of diabetes in Palestine is predicted to be very high, but the Palestinian healthcare system is too fragmented and fragile to face the significant burden of diabetes and all other consequences related to its complications. A clear understanding of the challenges that face the provision of affordable, accessible, evidence-based, community-based, high quality, and equitable services to all diabetes patients and high-risk communities, will help build the national healthcare system to better serve the Palestinian communities. The successful implementation of DCCM could illuminate the general state of the healthcare system, and could serve as a tool for broader health system reforms.

This study will build on the results of a Master’s Thesis completed at Ben-Gurion University, entitled: “Diabetes Control of Patients Registered and Followed-up in the Diabetes Care Center at the Augusta Victoria Hospital-Jerusalem”. The study had shown significant improvement in diabetes control with the implementation of DCCM. The study suggested a set of recommendations that could serve as essential tools in building-up the diabetes care in Palestine. The main recommendations of the study were to continue the implementation of DCCM, task shifting, training of providers, and pushing this model for implementation in the community clinics at the primary healthcare system through the introduction of the mobile diabetes clinic. The DCCM, which was established and implemented at the Diabetes Care Center of the AVH in 2003, has been adopted and successfully applied in the MOH center in South Hebron, UNRWA center in Bethlehem, and the Union of Health Work Committees center in the Gaza Strip. The implementation of DCCM will continue taking place in the middle and north regions of the West Bank (Ramallah, Tulkarem and Qalqilya districts) in partnership with the MOH, and UNRWA until fully implemented in all health centers and community clinics by the Palestinian healthcare system. International partnerships and support for these initiatives were crucial to the success of the program. The program received support from Denmark through the Danish Church Aid (DCA), the World Diabetes Foundation (WDF); and acknowledged by the International Diabetes Foundation (IDF) in recognizing the Diabetes Center at Augusta Victoria Hospital as a "Center of Excellence to Diabetes Care" and a "Center of Education for Diabetes" in 2017. This study will be the cornerstone to show evidences and clear portrait of the Palestinian healthcare system challenges and the way it operates within the context of chronic conflict, system and territorial fragmentation, political division, and dependency on external aids. This understanding could help in generating recommendations necessary to restructure the system of diabetes provision and presenting it within the framework of scientific research. This research will make available its conclusions and recommendations for the national healthcare system reform.

## The Global Picture of Diabetes:

Diabetes is a serious chronic condition associated with diffuse complications and an increased risk of premature death, imposing enormous financial pressure on national health care systems and national economies[4]. It is one of the fastest growing global health emergencies of the 21st century [2]. Like other NCDs, diabetes is increasing social and economic inequalities throughout the world, within and between countries, and threaten the achievement of internationally-agreed development goals and human rights standards [5][27]. The World Health Organization (WHO) estimates that globally, high blood glucose is the third highest risk factor for premature mortality, after high blood pressure and tobacco use. Many governments and public health professionals, however, remain largely unaware of the current impact of diabetes and its complications. In 2019, the IDF estimated that 463.0 million adults aged 20–79 years worldwide (9.3% of all adults in this age group) have diabetes. It is estimated that 79.4% live in low-and middle-income countries [2]. Based on the 2019 estimates, by 2030, a projected 578.4 million, and by 2045, 700.2 million adults aged 20–79 years, will be living with diabetes. The most substantial increases will take place in regions where economies are moving from low-income to middle-income levels [5]. In addition, the IDF has estimated that one in two (50.1%), or 231.9 million of the 463 million adults living with diabetes, (overwhelmingly type 2 diabetes, aged 20–79 years,) are unaware that they have the condition [2]. The earlier a person is diagnosed and management is initiated, the better the likelihood of preventing dangerous and costly complications. There is an urgent need to screen, diagnose and provide appropriate care to people with diabetes.

Diabetes-related mortality estimates are an important measure of a population’s health and can provide valuable information when assigning priorities to the design and implementation of clinical management; and public health prevention strategies [4]. In 2019, it is estimated that 4.2 million adults aged 20–79 years will die from diabetes, accounting for 11.3% of deaths from all causes. This is equivalent to eight deaths every minute. Almost half of these deaths (46.2%, 1.9 million) are estimated to occur in adults younger than 60 years [4][2]. The percentage of deaths attributable to high blood-sugar or diabetes before the age of 70 is higher in low-and middle-income countries than in high-income countries, according to the WHO diabetes global report 2016 [1]. Premature mortality attributed to a high risk of diabetes short-term and long-term complications included heart attack, stroke, kidney failure, leg amputation, and vision loss and nerve damage. Diabetes has substantial economic impact on countries, national economies and national health systems, due to an increased use of health services in hospitals and outpatient care, loss of productivity, and the long-term support needed to overcome diabetes-related complications, such as kidney failure, blindness or cardiac problems. The majority of countries spend between 5% and 20% of their total health expenditure on diabetes [1]. In 2019, the IDF estimates that the total diabetes-related health expenditure will reach USD 760 billion. This represents a 4.5% increase on the 2017 estimate [2]. With such a high cost, the disease is a significant challenge for healthcare systems and an obstacle to sustainable economic development [1].

## The Regional Picture of Diabetes

The International Diabetes Federation IDF-MENA (Middle East and North Africa) countries, of which Palestine is a member, have amongst the highest rates of diabetes in the world. This increase has been attributed to rapid economic development and urbanization; changes in lifestyle that have led to reduced levels of physical activity, increased intake of refined carbohydrates, a rise in obesity and the aging of their populations [28]. These factors have led to an increase in diabetes prevalence and risk factors. The MENA Region has the highest age-adjusted comparative prevalence of diabetes in people aged 20–79 years in 2019, 2030 and 2045 (12.2%, 13.3% and 13.9% respectively)[2]. Approximately 54.8 million adults aged 20–79 years, have diabetes. The majority (87.2%) of adults with diabetes in the Region live in low-or middle-income countries. It is estimated that the number of people with diabetes in the Region will increase by 38.8% by 2030 and by 96.5% by 2045, the second highest increase of all the IDF Regions [2]. Countries with the highest age-adjusted comparative diabetes prevalence in the MENA Region are Sudan (22.1%) and Pakistan (19.9%). Countries with the largest number of adults with diabetes aged 20–79 years are Pakistan (19.4 million), Egypt (8.9 million) and Iran (Islamic Republic of) (5.4 million). In MENA, there are 24.5 million adults with undiagnosed diabetes, and, therefore, at considerable risk of diabetes complications and poor health outcomes [2] . Proportions of undiagnosed diabetes are higher in low-and middle-income countries in the MENA Region (50.0%) than in high-income countries (40.7%). This could be due to a range of factors, including access to healthcare – both regarding distance from a health provider and affordability of care -, healthcare providers’ level of training, and because healthcare priorities in lower-income countries tend to be more focused on acute rather than chronic conditions [28].

Diabetes and its complications were responsible for an estimated 418,900 deaths in adults aged 20–79 years in 2019 (16.2% of all-cause mortality), with the highest percentage (22.4%) in the age group 30–39 years [4]. About 53.3% of all deaths from diabetes in MENA occurred in people under 60 years, making it the Region with the second highest proportion of diabetes-related deaths under 60 years of age. Most of the diabetes-attributable deaths occurred in middle-income countries, which account for 86.7% of all diabetes-related deaths in the Region [2]. In 2019, diabetes-related health expenditure in the MENA Region totaled USD 24.9 billion and this is expected to increase by 30.3% to USD 32.5 billion by 2030. The total annual diabetes-related health expenditure is projected to reach USD 38.6 billion in 2045. There is a great disparity regarding the annual amount spent per person with diabetes in the MENA Region. The highest is estimated to be in Qatar (USD 1,751) and Lebanon (USD 1,548), while Pakistan has the lowest (USD 83) [2].

## The National Picture of Diabetes

Non-Communicable Diseases (NCDs) present a major challenge to the Palestinian healthcare system. They account for the largest proportion of morbidity and mortality in Palestine. The main NCDs (cardiovascular diseases, cancers, strokes and diabetes) are responsible for 57.3% of the total reported deaths in 2018 [13]. The increasing prevalence of NCDs in Palestine, similar to other developing countries, is linked to changes in lifestyles and health behavior, lack of physical activity, unhealthy eating habits, and high prevalence of smoking. Therefore, efforts should aim at promoting health behaviors among individuals and a healthy environment in the Palestinian society in order to reduce the incidence of these diseases and the associated morbidity and mortality to the possible extent to improve people’s health and life expectancy.

Diabetes prevalence estimates have been difficult to obtain, given the fragmented nature of the Palestinian health system and the lack of reliable, updated epidemiological studies. However, a study published in 2012 estimated that the prevalence in adults aged 25 or older was 9.7% in 2000, and increased to 15.3% by 2010. The forecasts for the prevalence of diabetes are 20.8% (18.0–23.2) for 2020 and 23.4% (20.7–25.8) for 2030 [11]. The incidence of type 2 diabetes in Palestine is not reported accurately [29]. In the Palestinian national population-based survey (STEP-wise 2010/2011) on risk factors of type 2 diabetes of adults aged 15–64, the annual incidence rate ranged from 150 to 220 per 100,000 populations. However, the reported cases may represent half of the actual cases, as there is currently no screening program in place for the early detection of diabetes [29]. Another potential explanation is the underreporting of cases since there is no real-time electronic medical record system at the point of care (e-Health) for monitoring incidence, prevalence, and treatment outcomes in the MOH primary healthcare clinics [30]. In 2019, the new reported diabetes cases in the MOH PHC diabetes clinics in the West Bank were 5,671 cases with an incidence rate of 210.4 per 100,000 populations, distributed to 2,505 cases among males with an incidence rate of 182.7 per 100,000 populations, and 3,166 among females with an incidence rate of 239.1 per 100,000 populations [31]. Diabetes was reported as the third leading cause of death in Palestine accounting for 12% of all deaths [31].

The UNRWA reports a continuous increase in the number of patients with NCDs registered at UNRWA Health Centers (HC). In 2019, a total of 277,350 Palestine refugee patients, with diabetes mellitus and/or hypertension were registered with UNRWA NCD services at all HCs across the five fields of UNRWA operations. The Agency-wide prevalence rates of diabetes mellitus and hypertension were similar to that in 2018; it was 14.9% for diabetes and 21.8% for hypertension among those above 40 years old [32].

In the Gaza Strip, due to the political division between Fatah and Hamas, diabetes services were heavily influenced by unstable politics, access restrictions and referrals to the West Bank and Jerusalem hospitals, in addition to high poverty and unemployment. Diabetes prevalence in the Gaza Strip also approaches 15-20%. According to the MOH, the total number of diabetes cases in Gaza Strip was 27,601 patients, with an incidence rate of 1540/100,000 [33]. The main reasons behind the high rates of diabetes in Gaza are the lack of awareness on how to treat and how to prevent the disease, high levels of obesity, aging populations and sedentary lifestyle.

Studies in Palestine show poor glycemic control in diabetes patients, which is associated with several complications. A study done at the Diabetes Center in the Augusta Victoria Hospital showed a mean HbA1c of 9.21% (N = 1221, SD = 2). Only 16.1% of the sample met the target of HbA1c of <7.0% for diabetes control and approximately 50% had an HbA1c above 9%. Hypertension (BP >140/ 90) was found in 23% and dyslipidemia, as indicated by elevated total cholesterol more than 200 mg/dl, was present in 37.3% of patients [12]. In another study conducted by Birzeit University, a sample of 517 individuals with diabetes mellitus type 2 (was selected from 11 diabetes clinics owned by the Palestinian MOH, UNRWA, and jointly by non-governmental organizations and the MOH). The mean HbA1c was 8.8% (SD = 2.0). One in five patients had glycemic control (HbA1c <7%) [34]. The UNRWA clinical audit results have concluded that by using HbA1c tests (i.e. <7%), diabetes control rates among UNRWA patients were found to be low. The average control rate was 25.2% (5.3% for type I patients, 28.3% for Type II patients and 25.0% for patients with diabetes and hypertension) [35].

Due to the poor control of diabetes, there is a concern about high rates of diabetes complications, especially micro-vascular complications. It was found that the overall prevalence of micro-vascular disease among patients with diabetes was 38.7% [12]. A community-based study in Ramallah health governorate showed a prevalence of diabetes complications as follows: retinopathy 36.4%, neuropathy 26.2%, and nephropathy 7.5% [29]. While UNRWA reported a prevalence of 17.2% myocardial infarction, 3.8% cerebral stroke, 0.3% total blindness; Peripheral neuropathy was seen in 30.2% of the UNRWA patients [35].

## Palestinian Healthcare System

The Palestinian health system in both the West Bank and in Gaza consists of five healthcare providers providing diabetes care: The Palestinian Ministry of Health (MOH); the United Nations Relief and Works Agency (UNRWA), Palestinian Non-Governmental Organizations (NGOs), the Palestinian Military Medical Services (PMMS), and the private sector. While, Jerusalemites holding the permanent residency and live in East Jerusalem or in the extended borders of the Jerusalem municipality as in Qalandia, Samiramis, Kufr Aqab, and Anata, are receiving their health and diabetes services through the Israeli sick Funds (Kupot Holim) [13][12]. The current Palestinian health system is made up of fragmented services that grew and developed over generations and across different regimes [36] . In 1993, Israel and the Palestine Liberation Organization (PLO) signed a historic Declaration of Principles followed by a 1994 Agreement on the Gaza Strip and Jericho Area, which set the stage for the creation of the Palestinian Authority (PA) later that year [16]. Subsequent series of negotiations and agreements resulted in further phased-out transfer of powers and responsibilities to the PA, including overall responsibility for health care provision. The Palestinian MOH inherited health services that had been neglected. Supported by massive funding from international donors, the ministry has since upgraded and expanded the health-system infrastructure by institution building and human-resource development [36].

The Public Health Law No. 20 approved by the Legislative Council in 2004 in accordance with the articles 16, 22 and 29 of the Basic Law, defines the role of the Ministry of Health as a regulator of health system and as a main health provider [37]. The MOH, since its establishment, has had a clear administrative structure which has never been perfected due to political and financial instability and/or due to the lack of adhering to consistent visions and strategies. The lack of efficient monitoring on all levels lead to a weak performance negatively affecting the execution of the strategic plans drafted to serve the implementation of the right to health within a comprehensive system of rights needed for building a modern democratic state [37].

The UNRWA was created in 1949 and has been a key provider of health and education services to Palestinian refugees. It provides assistance and protection for approximately 5.8 million Palestine refugees in the five Fields of operations today – Jordan, Lebanon, Syria, the West Bank and Gaza [15]. The UNRWA Health Program continues to deliver comprehensive preventive and curative primary health care (PHC) services to Palestine refugees through a network of 143 PHC facilities, and supports patients to access secondary and tertiary health care services that UNRWA, either partially reimburses hospitals for treated cases, or negotiates contracts with government, NGOs and private hospitals [14]. The UNRWA was able to develop its own system of basic services, including health, education, relief and social services, for the refugees relatively independently. However, with the highly centralized administration, the bureaucratic structure did not foster Palestinian capacity building and leadership at the top echelon [16]. UNRWA still faces funding shortfall to continue providing education, health and relief and social services to Palestinian refugees. UNRWA’s financial problems started at the beginning of 2018 with an overall budget shortfall of US$146 million. The situation was then severely aggravated, by the withdrawal of funding from the largest UNRWA donor; the USA [32].

In defiance and in response to the acute needs of the population, grassroots popular health committees, affiliated with Palestinian political movements, emerged in the late 1970s to fill the gaps left by the Israelis in the health service provision[16]. These active and activist NGOs based their approach on reaching out to underserved areas with volunteer health providers and promoting preventive care, health education activities, and popular participation in addressing health issues and grassroots mobilization. in addition to basic curative services. After the establishment of the Palestinian National Authority, the NGOs continued to be a major health service provider, however, they did so under the new MOH. Currently, the NGOs cover the shortages and gaps of the MOH, especially in poorly accessible areas. These areas are more easily accessed by NGOs as they have better outreach to Area C and East Jerusalem [14]. Faced with the new situation on the ground, the role of the NGOs began to change in several respects[16]. Certain NGOs have had to downsize their operations, while others remain significant providers of essential services, such as primary care services, community-based rehabilitation, mental health schemes and health education; and they constitute a vital platform for debate on issues of health policy and planning, centralization/decentralization, coordination and information-sharing. There is little coordination and cooperation between the public and NGO sectors. This disconnects results in a system where the MOH is steward of the public system only, rather than the entire sector. It sees NGOs as competitors rather than collaborators, with planning, including allocation of infrastructure and health staff, being done without consideration of the overall sectoral distribution and needs [21].

The Palestinian private health sector is owned and run by individual physicians on a fee-for-service basis and has grown remarkably in recent years. Many private hospitals, clinics, laboratories, rehabilitation centers and the pharmaceutical industry have developed as a result. It attempted to provide an independent alternative in health service provision [16]. The PA initially encouraged the investment of private companies in health. For that reason, it is noticeable that many private health institutions were established with the main focus on the provision of the expensive tertiary care. After the second intifada, in year 2000, with worsening political, economic and security situation, in addition to restrictions on movement and high rates of poverty; the contraction of private sector investments in both the West Bank and Gaza was strained.

### Primary Health Care (PHC)

The Ministry of Health provides diabetes services mainly through the PHC system. The number of PHC centers expanded from 454 in 1994 to 732 in 2018, with an increase of 61.2% since 1994 [38]. 585 centers located in the West Bank and 147 in Gaza Strip. 468 primary health care centers belong to the Palestinian MOH, which constitutes 63.9% of the total number of primary health care centers. The number of primary healthcare centers managed by NGOs reached 182, constituting 24.9% of all Primary health care facilitates, while the number of UNRWA centers reached 65, and the military medical centers reached to 17 centers [13][38].

### Secondary Health Care (Hospitals)

The Ministry of Health is considered to be the main provider of secondary and tertiary health care services (hospitals) in Palestine; where it owns and operates 3,462 beds in 27 hospitals in all governorates from 82 hospitals working in Palestine, with 6,440 beds with a rate of 12.9 beds for each 100,000 of populations. 52 of the total hospitals are in the West Bank including East Jerusalem, with a total bed capacity of 3,897 beds which 60.5% from the total beds in Palestine, while the rest are in Gaza Strip [38]. The NGOs run 35 hospitals with a capacity of 2,141 beds and the private sector runs 17 hospitals with a capacity of 631 beds. The UNRWA has one hospital in Qalqilya with the capacity of 63 beds. The Military Medical Services have two hospitals in Gaza Strip with capacity of 143 beds. In 2019, the percentage of bed occupancy in the MOH hospitals in the West Bank was 103.4% and 100.1% in Gaza Strip. Due to the lack of advanced health services, the MOH purchases such services from the private, NGOs or neighboring countries. In 2019, the total number of referrals outside the MOH facilities was 104,881 cases; an increase of 4.5% over the year 2018, with a total of 109,818 referrals for purchasing the services from outside of the MOH facilities. The total estimated cost of all referrals amounted to 924,084,880 NIS [31].

### Health Workforce

The MOH is the largest employer of human resources working in the health sector in Palestine. In 2019, the number of employees in the Palestinian MOH reached 13,969 employees [31]. The number of physicians increased from 17.4 in 2009 to 20.2 per 10,000 populations in 2012. In the same period, the number of nurses and midwives increased, at a higher rate compared to physicians, from 16.4 to 19.7. The number of dentists rose from 4.6 to 6.1, and the number of pharmacists from 7.6 to 11.5 per 10,000 populations. Cumulatively, the availability of health workers in the Palestine surpasses many countries with similar income levels and countries in the MENA Region [21] However, the regional disparities in health personnel are increasing between the West Bank and Gaza. For instance, the density of physicians per 10,000 in Gaza declined from 17.5 in 2009 to 15.9 in 2012, whereas it increased in the West Bank from 17.4 in 2009 to 22.9 in 2012. Moreover, the composition of health workforce is characterized by imbalances in skill mix, with administrative staff accounting for the majority of employees and acute shortages of doctors with sub-specialties and significant brain drain, particularly to Gulf Countries [39]. Despite some efforts of the MOH to prioritize primary health care, the majority of the MOH health personnel work in hospitals; in 2012, 58 percent of all physicians, 68 percent of all nurses, 60 percent of all midwives and 45 percent of all administrative staff in the West Bank worked in hospitals. The administrative and service staff represented the largest category of the MOH healthcare workers, accounting for 35 percent of all MOH employees in 2012, with efficiency implications for the MOH services[39]. A recent World Bank study found the prevalence of dual practice in the health sector is close to 100 percent with little differentiation in the level of activity between the different cadres of health workforce, or by specialty, seniority, etc. The study indicated that dual practice was perceived as a coping mechanism to compensate for low salaries in the public sector and, that in the face of economic hardship, many physicians resort to private practice as a way of diversifying, and in some cases supplementing their incomes. On the other hand, this might impact the quality of services in the public sector. This is largely because (i) physicians may provide better quality services at private facilities rather than in the public sector for the same condition, and (ii) long working hours may result in exhaustion and poor performance in the public sector. Furthermore, dual practice is likely to have financial and governance implications for the Palestinian health system. For example, dual practice may lead to self-referrals (i.e., physicians referring patients to private hospitals where they work), producing a conflict of interest and inflating the referral bill for the MOH and contributing to high Out of Pocket (OOP) spending [21][39].

### Health Expenditure

According to the data of the General Department of Finance in the Ministry of Health, the current budget of the MOH for the year 2018 was NIS 1,767,295,225 [38]. Salary payments to staff comprised the single largest proportion of the Palestinian Ministry of Health expenditure at 49% of the total expenditure. This was followed by expenditure on referrals outside the Ministry of Health (34% of the total), medicines and medical consumables (13%) and capital expenditures and other operating costs (4%) [18]. The MOH refers Palestinian patients to non-MOH facilities for specialist healthcare not available in the public system. The main destinations for these referrals are mainly in East Jerusalem (39%), the West Bank outside East Jerusalem (34%), Israel (17%) and the Gaza Strip (11%) [18].

Between 2000 and 2012, the total health expenditure more than tripled from US$126 million in 2000 to US$1.3 billion, corresponding to an increase in per capita health expenditure from US$126 to US$294. The public spending on health quadrupled from US$126 million to US$488 million and out of pocket (OOP) spending increased substantially from US$152 million to US$502 million [21]. The financial sustainability of the healthcare system is in uncertainty. The recent conflict in Gaza exposed major weaknesses in institutional and regulatory systems; and highlighted the precarious fiscal position in which the sector finds itself. Moreover, the uncertain foreign aid flows, the increasing costs of referrals, inefficiencies and duplications of service, and an excessive focus on tertiary care are together straining the fiscal situation of the health sector. The health expenditures are on the rise, while health outcomes are below potential for current levels of spending. The overall health expenditures (public and private) more than tripled in the last decade, reaching 12 percent of GDP—one of the highest shares of GDP in the world. Public spending on health is close to 5 percent of GDP, and exceeds the MENA average of 2.6 percent and the Low-and Middle-Income Country (LMIC) average of 1.7 percent of GDP [21].

## Diabetes Policies and Management Protocols

The MOH is the responsible national institution for leading and regulating the functioning of the health sector and ensuring the necessary resources for its sustainability and development in response to the changing and increasing needs of the entire population. The Public Health Law of 2004 lists the MOH functions and responsibilities, which include delivery of the government’s preventive, diagnostic, curative and rehabilitative health services; regulation of the health sector functioning to ensure high level of harmonized and integrated work between the different service providers and sectors; development of national health regulations, laws and policies; and reinforcement of the health financing system and optimal investment of the available resources [13].

The Palestinian healthcare system lacks comprehensive health policies, including a health-promoting environment formulated in genuine consultation with the population [16]. Since the establishment of the Palestinian Authority after the Oslo Accord agreement in 1993, the healthcare system has faced obstacles related to policy formulation, including: ongoing conflict, fragile Palestinian quasi-state structures and institutions, multiple, and at times, inappropriate donor policies and practices in the health sector; and a policy vacuum characterized by the absence of an internal Palestinian debate on the type and direction of reform the country needs to take [16]. The first official national health plan was published in 1994 after the formal handover of the healthcare system from Israel, aiming to regulate the health sector and integrate the activities of leading healthcare providers. However, attempts to create an effective, efficient, and equitable system have been unsuccessful. The National Health Strategy 2017-2022 is anchored in six national strategic objectives that have been agreed through consultation and consent of all stakeholders, as follows:[13]

1. Ensure the provision of comprehensive health care services for all citizens towards nationalization of health services in Palestine.

2. Promote programs for the management of non-communicable diseases (NCDs), preventive health care, community health awareness and gender issues.

3. Mainstream quality systems in all aspects of health service delivery.

4. Enhance and develop the human resource management system.

5. Enhance health governance, including effective management of the health sector, enforcement of laws and legislations, cross-sectoral coordination and integration among service providers.

6. Enhance health financing and improve financial protection of Palestinian citizens against health costs.

In its targeted interventions and output plans, the strategy mentions diabetes as one of the NCDs that has been targeted throughout different interventions. It is unfortunate that in targeted interventions, the strategy sees the WHO’s PEN approach (Package of Essential Non-Communicable Diseases) as the primary program to fight NCDs. The PEN approach has not been internationally recognized to improve and reform NCD programs effectively.

Another important issue regarding the financing of proposed interventions: it is donor dependent. The political atmosphere in the area and the progress in the peace process with Israel will be crucial to receiving support, primarily from American donors. The MOH calls for coordination and networking with other health providers, mainly, the UNRWA. The MOH, though, does not influence the UNRWA system. Any serious cooperation between the two parties would be voluntary, and subject to a good understanding and rapport between individuals. The MOH would not be able to enforce programs like a national diabetes protocol or information system-sharing on the UN system.

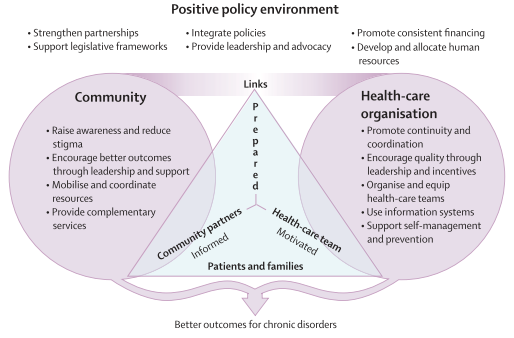
In 2008, and in cooperation with the World Health Organization (WHO) and the Austrian Development Cooperation, the MOH adopted a “quick reference guide for the management and care of Diabetes Mellitus,” which builds on the WHO guidelines. At the same time, the UNRWA developed its guidelines and protocols for the management of diabetes management. These guidelines were published under the name “Technical Instructions and Management Protocols on Prevention and Control of Non-communicable Diseases,” although they are not exclusively targeted toward diabetes. Both the MOH and the UNRWA protocols are based on the WHO guidelines for the year 2006, differing, at times, from one another. Occasionally, they deviate from the WHO guidelines and adopt the WHO recommendations; for example, regarding patient education and advice on diet, as well as the types of recommended oral anti-diabetic agents and combined therapy with insulin.

In 2010, and through the support of a flagship project (USAID – funded project), a National Committee was established to review all published protocols and guidelines, and to build a new comprehensive protocol for diabetes care and prevention that would be adopted by all providers. The committee produced a document called the “Standard of Care for Healthcare Centers.” This document, nonetheless, was not approved. That same year, a National Committee for NCDs was established, with the following mandates: (1) to bring all involved stakeholders together to help coordinate diabetes care and prevention activities; (2) to prevent duplication of services; (3) to ensure proper dissemination and to network with all involved parties; and (4) to develop a national diabetes protocol, strategies and action plans related to diabetes care and other NCDs stakeholders to be firmly engaged and cooperative. Initially, the committee was very active. Due to frequent changes in ministries and governments, nevertheless, and the fact that many members left the committee, it became inactive; and no further progress has been made to unify diabetes protocols and related policies.

## Diabetes Models in Low Resource Settings

Globally, chronic Non-Communicable Diseases (NCDs) have emerged as the leading causes of death. They together accounted for 72.3% of deaths in 2016. According to the WHO, 86% of premature deaths occurred in low-middle-income countries (LMIC) due to the increase of the ageing of populations, urbanization, and globalization of risk factors. The growing burden of chronic diseases is a huge challenge for healthcare services world over [40]. The healthcare systems in LMIC’s, traditionally, are geared towards care for acute conditions but now need to respond to the increased burden and challenge of chronic care. Unlike the goals of infectious diseases care, the goals of NCD’s care are not generally to cure, but to enhance functional status, minimize symptoms; and prolong and enhance the quality of life, including pain palliation. This requires ongoing monitoring and often lifelong adherence to treatment [41]. If primary care is to be an effective platform for managing NCDs, it must move from episodic care for symptoms to an integrated approach to prevention, diagnosis, treatment, and palliation across overlapping conditions and time. One proven approach for achieving this is through providing regular care by multidisciplinary teams that can address multiple conditions of each patient.

The Development of diabetes models that are specifically designed to deal with high burden of diabetes in LMICs or healthcare settings could help to launch to steer the development of effective future models for diabetes in such countries. Several organizational models of management for chronic diseases have been proposed and implemented internationally. There is no single model that fits all aspects of diseases. Palestine represents an example of models that should take into consideration the additional challenges besides the traditional LMIC challenges that are related to the chronic nature of the conflict, the system and territorial fragmentations; multiple providers, and political division between Palestinian political factions. There are many other innovative and effective models of chronic disease management that have had international influence in the context of LMIC that include: a stepped-care approach, the chronic disease self-management program, and integrated chronic disease management, etc. Appendix 1 summarizes some of these models. According to a comprehensive report published in 2006, the best known and most influential is the chronic care model, which focuses on linking informed, actively engaged patients with proactive and prepared healthcare teams [42].

The WHO Innovative Care for Chronic Conditions *(see figure; adapted from Beaglehole, R. et al 2008)* provides a model for care of NCDs, which is particularly relevant to primary health-care settings in low-and middle-income countries. The framework has been a major influence on the management of NCDs in many countries. It intends to present health-care solutions for effective management of long-term health problems [24]. It provides a roadmap for health systems to meet the increasing needs of chronic disease care. The model has at its center, a triad of patient and family, community and health care team. The triad in turn is supported by the larger health care organization, community and policy environment at the meso and macro levels respectively [43]. Furthermore, the 2016 WHO's integrated, people-centered health services framework, emphasized the importance of organizing primary health care (PHC) around the comprehensive needs of people, rather than around a singular focus on specific diseases. When combined with population-wide preventative measures, people-centered PHC can prove very effective in tackling NCDs both at the population and individual levels [44]. The framework helps in taking action by using ‘the health systems building blocks’ at each level, and tries to comprehensively understand the situation at these multi-levels in order to take action, which is useful for investigating access to chronic NCD care [24]. According to the chronic care model, six areas need improvement to facilitate chronic care community resources; health systems; self-management support; decision support; delivery-system redesign; and clinical information systems [42]. Together, they strengthen the primary health care in LMICs and emphasize the central importance of primary health care in the prevention and management of chronic diseases. The model additionally requires a focus on: the quality of communication between health professionals and patients, emphasis on the availability of essential medicines, diagnostics and trained personnel at decentralized levels of healthcare, and mechanisms for coordination between healthcare providers [40]. An adapted chronic care model with the additional themes identified could guide the organization of chronic care in LMIC settings. Implementation research is required to test the effectiveness of interventions that operationalize the suggested model of care in LMICs.

### The Augusta Victoria Diabetes Care Model

Early in 2003, AVH, with the support of the World Diabetes Foundation (WDF) and Danish Church Aid (DCA), established the diabetes program. The program aims to introduce a comprehensive diabetes care model in the Palestinian health sector, and to establish national referral center for diabetes care, prevention, and research. AVH acquired a team of dedicated professionals, to plan and implement the model, made available all necessary equipment and linked the program with dedicated international consultants from Denmark. AVH considers diabetes a priority area of health care, and thus placed it at the center of the hospital’s mid-term development plan that was approved by the Board of Governance. Also, AVH managed to integrate its work with the national diabetes program led by MOH. Diabetes Comprehensive Care Model (DCCM) that replaces the prevailing physician-centered approach in the Palestinian healthcare system, where patients only see their physicians to renew their medication prescriptions [12]. The DCCM involves a modification of the existing treatment procedures and a unification of best practices into a protocol and a holistic approach to diabetes care focused on the whole person, which takes into consideration and is oriented to the local context and focus in Palestine. The DCCM ushers in a new, innovative approach where the patient plays a central and active role in the diabetes care plan. The AVH diabetes team helps patients with the adoption of a healthier lifestyle, including physical activity and exercise, nutrition, weight control and smoking cessation. The team also provides foot care, eye care, individual and group counseling, standardized diabetes laboratory testing (HbA1c and Microalbuminuria (MAU)), patient, family and community education regarding diabetes care and prevention of complications, in addition to home visits.

AVH expanded the DCCM to the community through the introduction of a mobile clinic. The Mobile Diabetes Clinic, staffed by trained professionals, and equipped with a non-mydriatic digital eye screening camera, necessary foot care equipment and an insole-making machine; Blood Pressure machine, weighing scale, as well as blood and urine collection kits; the mobile clinic visits partner clinics in remote communities five days per week, in order to increase access to quality diabetes care, implement on-the-job training to frontline professionals, raise awareness of patients and communities; and refer cases for advanced treatment if needed [10].

## Theoretical Framework

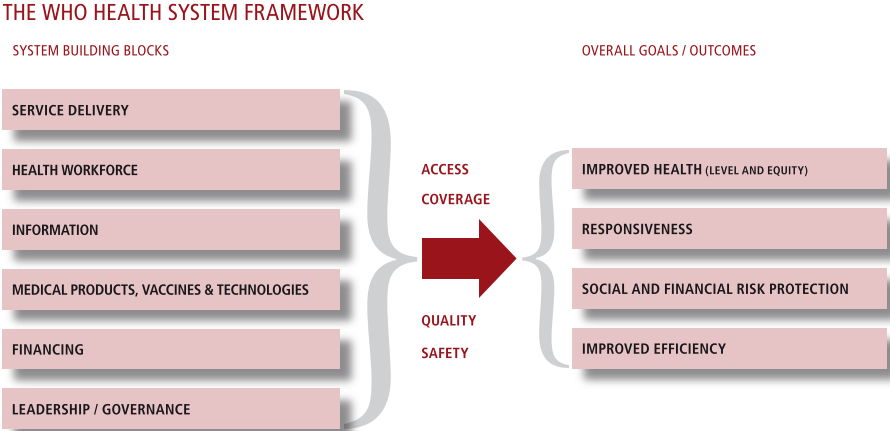
### The WHO Health System Building Blocks

The implementation of the WHO health systems building blocks is in particular impotence within the context of low and lower-middle income countries. LMICs are characterized by low levels of income and insufficient health expenditure. These countries face a shift in disease burden from communicable to non-communicable diseases including diabetes [8]. Many argue that health systems in these countries do not have the capacity to meet the needs of people with chronic conditions such as diabetes. A variety of barriers exist in terms of organization of the health systems and care, human resources, sufficient information for decision-making, availability and affordability of medicines; policies, and alleviating the financial burden of care. These health system barriers need to be addressed, taking into account the need to have diabetes included in the global development agenda, and also tailoring the response to local contexts including the needs of people with diabetes [8]. Within the Sustainable Development Goals (SDGs) the overarching SDG 3 focuses on achieving health and wellbeing. Target 3.8 states: “***Achieve universal health coverage (UHC), including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality and affordable essential medicines; and vaccines for all***” [2]. The UHC, as proposed by the WHO, has as its main aim: “***to ensure that all people obtain the health services they need without suffering financial hardship when paying for them***”. The UHC ensures that everyone is assured access to the services and medicines essential for their care. To address this challenge, the six building blocks of the health system: service delivery, leadership and governance, medical products, vaccines and technology, healthcare financing, health workforce and health information system need to be reinforced [45]. The health systems need to ensure that diabetes is included in the services provided as part of the UHC package of essential services. Each country needs to align these services with its technical and financial resources.

The main aim of the WHO framework is to promote common understanding of what a health system is and what constitutes health systems strengthening. They have been identified and conceptualized within economic, political and social contexts to improve the health status of populations, defend against threat to health, protection from financial risks, provide equitable access to people-centered care; and to ensure patient activation [45]. The building blocks serve three purposes. First, they allow a definition of desirable attributes – what capacity a health system should have to do in terms of, for example, health financing. Second, they provide one way of defining the WHO’s priorities. Third, by setting out the entirety of the health systems agenda, they provide a means for identifying gaps in the WHO support [25]. The WHO health system building blocks (Figure 2) are described as follows [8][25][26][45]:

1. **Service delivery:** Good health services are those which provide efficient, safe, quality personal and public health interventions to those who need them, when and where required, with minimum waste of resources. For diabetes, the comprehensive nature of care needs to include management of different elements of diabetes itself, such as a specialist consultation for eye and foot screening or care, but also the joint management of diabetes and other health conditions that the patients may have. Care should be accessible to the whole population without barriers (e.g., financial, language, culture, or geographical), and should be centered on the individual. People should also play an active role in their health and be educated and empowered to do so.
2. **Healthcare workforce:** A well-performing health workforce is one that works in ways that are responsive, fair and efficient, to achieve the best health outcomes possible, given available resources and circumstances. i.e., there are sufficient numbers and variety of staff, equitably distributed; they are competent, responsive and productive. The physicians’ training in diabetes has been mainly during their formal education with additional training provided by the diabetes associations, the pharmaceutical industry, or other organizations. Also, many countries lack advanced human resources for diabetes, such as trained podiatrists, nutritionists or nurses. Trained nurses and community health workers may be able to provide comprehensive care and manage many diabetes cases effectively. In most low-resource countries, such training is lacking. Training for diabetes needs to be included in all parts of the medical curriculum at pre-graduate, post-graduate, and continuing education levels for both doctors and nurses. The issue of task shifting also needs to be addressed. It may require specific laws to be changed, for example, with regards to nurses prescribing or modifying medications.
3. **Information:** A well-functioning health information system is one that ensures the production, analysis, dissemination, and use of reliable and timely information on health determinants, health systems performance, and health status. Lacking easily accessible data has negative impacts on individual care, as well as planning and management of supplies, medicines and achieving a systemwide approach to managing diabetes. Diabetes research is considered fundamental to generating knowledge and information for the formation of evidence-based policies and protocols, and determining priorities of care. The health information system provides the underpinnings for decision-making and has four key functions: (i) data generation, (ii) compilation, (iii) analysis and synthesis, and (iv) communication and use. The health information system collects data from health and other relevant sectors, analyses the data and ensures their overall quality, relevance and timeliness; and converts the data into information for health-related decision- making.
4. **Medical products, vaccines, and technologies:** A well-functioning health system ensures equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost-effectiveness, that are scientifically sound and cost-effective. Availability of an essential drug list enhances diabetes control and increases patient compliance and access to diabetes medicines and insulin. Also, availability and affordability were an issue for diagnostic and home care tools such as glucose testing strips, glucometer, ketone strips, and insulin syringes. Access has been defined as having medicines continuously available and affordable at public or private health facilities or medicine outlets that are within one hour’s walk of the population.
5. **Financing:** A good health financing system raises adequate funds for health, in ways that ensure that people can use needed services and are protected from financial catastrophe or poverty associated with having to pay for them. Diabetes care financing in low-resource countries is highly challenging. The WHO estimates that health insurance schemes cover approximately 20-40% of NCDs-related costs in low-resource countries, in comparison to about 90% in the high-income countries [8].
6. **Leadership and governance** involve ensuring that strategic policy frameworks exist and are combined with adequate oversight and coalition-building, the provision of appropriate regulations and incentives, attention to system-design, and accountability.

(Figure 2: The WHO Health System Framework)



### Structural Competency

The structural competency is a framework for conceptualizing and addressing health-related social justice issues that emphasizes diagnostic recognition of economic and political conditions producing and racializing inequalities in health [46]. It calls on health care providers to recognize how institutions, markets, or health care delivery systems shape presentations of symptoms; and to mobilize medical expertise and authority for the betterment of clinical and extra clinical systems that lead to health and wealth imbalances [46]. As awareness of the impact of social determinants of health grows by health professionals, the corresponding need to focus on medical education, beyond cross-cultural understandings of individual patients, has simultaneously developed towards a focal point on the structures that influence health outcomes at levels beyond the limited traditional individual interactions. The structural competency is defined as the trained ability to discern how a host of symptoms, attitudes or diseases (e.g., depression, hypertension, obesity, smoking, medication “non-compliance,” trauma, psychosis) also represent the downstream implications of some upstream decisions about such matters as health care and food delivery systems, zoning laws, urban and rural infrastructures, medicalization, or even about the very definitions of illness and health, and so forth [47].

Without such a focus on the impact of social determinants of health and an understanding of how they affect patients, practitioners may be left perplexed as to why individual patients are unable to better manage their diabetes and unable to provide suitable guidance. When practitioners lack this understanding, they cannot use their experience and knowledge to enrich discussions around policy change. Much of the research and resulting clinical strategies have focused on the individual patient, without accounting for the influence of physical and social factors on behavioral practices. In Palestine, no research has been carried out to evaluate the extent to which health providers are aware of the impact of social determinants of health on diabetes diagnosis and management.

# Research Design and Methodology

## Research Overview

The Palestinian Healthcare system operates in a very complex and challenging environment. The current structure of the system, chronic conflict situation, internal division between political factions, territorial divisions between the West Bank and Gaza and within the West Bank area (areas A, B, C, H1, H2 and Jerusalem); in addition to the economic situation and governance, accountability and leadership pose severe challenges to the health sector at all levels of care. The challenges have implications on the six WHO health systems building blocks: 1. service delivery, 2. health workforce, 3. medical products and technology, 4 information, 5. financing and 6. leadership and governance, in addition to policies and legislations. In order to be able to understand and analyze such a complex situation, I used the mixed methods approach that combines elements from both qualitative and quantitative paradigms [48]. The purpose of using this diverse methodology is to reach a high level of reflection of the wide-ranging challenges facing the Palestinian healthcare system that determine its functions and the quality of care provided [49]. The mixed methods research produces converging findings in the context of complex research questions [50], broads the purposes of breadth and depth of understanding and verification, expands and strengths a study’s conclusions; and, therefore, contribute to the published literature. Mixed methods research is also about heightened knowledge and validity of research [48]. It will help in supplements and strengthening data sources to develop an in-depth understanding. This research discovers insights relevant to the structure of the Palestinian healthcare system and how it operates at all levels of diabetes care, and the context of challenges in which it operates.

## Research Paradigm

Proper conduction of qualitative research demands that the researcher states his paradigm to the research. The reason for this demand is that qualitative research can be evaluated in many different manners, and the quality of the research should be examined according to the chosen paradigm. Paradigms in mixed methods research contribute to understanding the use of inferences, assess the computer tools available to the mixed methods researcher, and add to the knowledge about interdisciplinary teamwork; or help understand whether mixed methods are a ‘‘method,’’ a ‘‘methodology—a method and a worldview,’’ or an approach to research within existing designs [51]. It allows researchers to see problems from different angles and perspectives. Most problems are solved by a mixture of observation and measurement and by asking people about their experiences, views and values. Researchers may be more likely to identify the paradigm and approach most appropriate to their research, consider and use strategies for ensuring trustworthiness, and keep track of procedures and decisions [52]. The main paradigms or worldviews that traditionally are presented as being fundamentally opposed are those of positivism/postpositivism and constructivism/interpretivism [53]. Each of these can be categorized further by examining their ontology, epistemology, and methodology.

The research is based on the WHO health system building blocks as being the framework and general guide to study, relate and analyze the performance of the Palestinian healthcare system with its main six components. Studies indicate that the WHO health system framework is instrumental in strengthening the overall health system, and uses as a catalyst for achieving global health targets such as the Sustainable Development Goals [1]. The WHO’s health system framework intends to improve the overall health in a responsive, financially fair and most efficient way. Evidences revealed that the framework helps to assess healthcare performances and interactions between health reforms and health systems; implications of health sector reforms; and the status of health facilities and specific health problems [54]. Using both interviews and the survey, the participants were given space to recommend and prioritize actions and measures to reform the healthcare system in Palestine. (Appendix 1) shows the integration and relationship between qualitative and quantitative research methodologies.

## Qualitative Research

The qualitative phase of this study included data collection and analysis from diverse sources. While the main source of data was the use of in-depth semi-structured interviews, additional qualitative data was utilized including document analysis and the grounded theory method.

### Definition and Related Concepts

Qualitative research is a type of social science research that collects and works with non-numerical data. It seeks to interpret meaning from these data with purpose to more thorough understanding the perspectives/experiences of individuals or groups and the contexts in which these perspectives or experiences are situated [52]. Sensitive and appropriate uses of qualitative research are providing new insights and directions about the human condition, health, and education [55]. Qualitative research methods allow health sciences to better understand how individuals make meaning of their social world, examine institutional and social practices and processes, understand socio-political culture of healthcare system, identify barriers and facilitators of change; and discover the reasons for the success or failure of interventions [56][57]. In other words, qualitative approach seeks to empower individuals’ stories, concepts, and viewpoints with the goal of understanding how they make meaning within the social world.

### Grounded Theory

Grounded theory was developed by Glaser and Strauss (1967). Its main thrust is to generate theories regarding social phenomena; that is, to develop higher level understanding that is “grounded” in, or derived from, a systematic analysis of data [50]. The goal of Grounded Theory is to develop an explanatory approach to fundamental social processes studied in the environments in which they take place. Grounded Theory examines the “six Cs” of social processes (causes, contexts, contingencies, consequences, covariance’s, and conditions) to understand the patterns and relationships among these elements [56]. Grounded theory is appropriate when the study of social interactions or experiences aims to explain the process. Within this context, I found grounded theory to be a very useful method of analysis in order to best understand how the Palestinian healthcare system operates, and the provision of diabetes care; within the context and the framework of the WHO health system building blocks.

### Document Analysis

Documents are considered rich data sources in qualitative research; while document analysis is a systematic procedure for reviewing or evaluating documents in both printed and electronic material. It is used to supplement and strengthen data sources in combination with other qualitative research methods in order to help develop better understanding and discover insights relevant to the research problems [58]. The relevant documents reviewed include: annual reports, strategy documents, policy documents, public health law, diabetes guidelines, protocols, international reports and publications (WHO, World Bank, donor reports); project proposals, and external evaluation reports. The collected data through the implementation of document analysis was reviewed through an iterative process of content and thematic analysis. Content analysis is a process of organizing information into categories related to the central questions of the research. While thematic analysis is a form of pattern recognition within the data, with emerging themes becoming the categories for analysis [56]. The process involves a careful, more focused re-reading and review of the data to perform coding and category construction based on raised themes and codes.

### Interviews

Qualitative research frequently relies on interviewing as the primary data collection strategy. Interview is a flexible tool to elicit the participant’s story. Both the researcher and the participant assume that their words will be understood as spoken and intended [56]. The interview guide contains well prepared questions on the six WHO health systems building blocks. It was reviewed by my research supervisor and research consultants. Questions were translated to Arabic by a professional translator, from Arabic the mother language, into English. The contents of the translated material were confirmed by conducting a reverse translation for checks and balances. Three pilot interviews were conducted by the researcher, together with the research supervisor. After vigilant review of the pilot interviews, the interview guide was edited and the final version of interview guide was prepared (appendix …).

The design of this study included a purposeful sampling for conducting in-depth, semi-structured, open-ended interviews for 23 healthcare professionals, managers and policymakers within the Palestinian healthcare system. The participants represented a systematic geographical distribution in the West Bank and Gaza that included physicians, nurses and nutritionists from the MOH, UNRWA, and NGOs. The participants explained the objective and the estimated duration of the interview and were informed that their participation is voluntary and that they can stop the interview at any time if they want. Interviews were conducted one-on-one and in the Arabic language after the participants agreed to partake in the study. The key information gathering interviews were conducted by the researcher. The interviewees were approached face- to-face, and the average time for each interview ranged from 30 to 40 minutes. At the beginning of each interview, the participants were given a full briefing on the purpose of the research, the format of the session and issues of confidentiality.

The interviews included, but were not limited to the following questions: \* could you please introduce yourself and your current relevance to diabetes care in Palestine? \* From your perspective, what are the challenges that face diabetes care in Palestine? The interviewer asked the participants to refer to the following sections: Service delivery, Healthcare workforce, Health information system, Medical products, and technologies, Financing, Leadership and governance. The participants were also asked to explain how they think the Palestinian healthcare system reform should operate from their own perspective; and they were asked to prioritize their suggested reform agenda.

The participants were encouraged to speak freely and were assured anonymity and that they will not be associated with data drawn from the interviews. The interviews were recorded for further review to ensure the accuracy in conveying the original real meaning by professional translators from Arabic into English. The data collected from the interviews were transcribed, translated into English and loaded to "NVivo 12 Pro" software. The data were coded based on themes raised form the interviews; and sub-themes were added whenever needed. The analysis of themes and the related sub-themes took into consideration the following issues:

* The actual words of interviewees and their meaning (participants’ experience and description of the challenges),
* The context of responses
* Frequency (how often the specific comment is made)
* Extensiveness (the number of participants who express a particular view) of comments
* The intensity of observations (depth of observations)
* The internal consistency (noting any changes in position or opinion)
* The personal experiences and their perspective on how to reform the healthcare system.

## Quantitative Research

In this part of research, I used survey questionnaire. The survey was built on the themes, sub-themes and other outcomes of the qualitative research, published literature and internationally validated surveys. I did review the literature to find out similar studies and validated questionnaires that assisted in the building of the study survey. In addition, I have adopted some parts of an internationally validated tool "Context Assessment for Community Health (COACH) for low and middle income settings [59]. I also reviewed and benefited from other two published researches that used the WHO health system building blocks to survey healthcare professionals to determine the performance of public healthcare facilities: Iraqi health system in Kurdistan region: medical professionals’ perspectives on challenges and priorities for improvement [60] and Using the World Health Organization health system building blocks through survey of healthcare professionals to determine the performance of public healthcare facilities [54].

A "5-level Likert scale" survey (1= strongly disagree, 2= somewhat disagree, 3= neither agree nor disagree, 4= somewhat agree, and 5= strongly agree), was constructed and loaded to the Qualtrics software. The survey contains 5 parts: Part one was the introduction part of the research and included acceptance of research terms and conditions. Part 2 included demographic information about the participants and their experience in diabetes care. Part 3 included main themes and sub-themes related to the WHO health system building blocks that have been extracted from the qualitative part of the research. Part 4 was about ranking main themes related to the health system reform and prioritization according to the participants’ points of view. The last part of the survey gave space to participants to write about any other themes or priorities the participants chose to highlight or include that were not mentioned in the survey.

The survey was reviewed by the supervisor, translated into Arabic by professionals and native Arabic speakers. The translation was authenticated by performing a reverse translation. The survey was piloted on 10 healthcare professionals. Edits, comments and recommendations were integrated to the second version of questionnaire. The new version of questionnaire was sent to another 10 professionals and senior consultants within the Palestinian healthcare system for another round of validation. In the final version of the questionnaire, all comments, recommendations, and related edits were added and integrated; and approved by the study supervisors.

My research has targeted the Palestinian healthcare professionals (physicians, nurses and nutritionists) who work in the Primary Health Care System in the West Bank and Gaza. The survey was delivered to them by using Qualtrics software as an anonymous email link and by social media. The participants were provided with detailed description on the research. Only those who accepted the terms and conditions of the research, participated in the survey. If they did not accept the terms of the research, Qualtrics would automatically take them to the last part of the research and would thank them for their choice.

To increase the response rate, I followed-up directly with the MOH and UNRWA officials to encourage the participation of their teams to respond to the survey. The AVH mobile clinics team, and through their regular visits to the primary healthcare and community clinics asked the local staff of clinics to fill in the questionnaire through the provided link. In rural clinics where internet and/or computers were not available, the AVH mobile clinic team offered to help the local staff to fill-in the questionnaire by using the tablets and internet access available in the mobile diabetes clinic. In addition, in the rural clinics in Gaza and clinics not reached by our mobile clinic team, the questionnaire was printed out and sent to participants as a hard copy and collected back after one week.

The survey was active and accessible during the study period from September 2019 until the end of February 2020. After that period and the closure of participation in the survey, data exported from Qualtrics to the Statistical Package for the Social Sciences (SPSS version 21.0) to do the statistical analysis. Data were reviewed and cleaned. Categorical variables were recoded to dichotomous variables.

The first stage of analysis included the generation of descriptive statistics for all socio-demographic variables with mean, and standard deviation used for continuous variables, and percentages used for categorical variables. The second stage was the use of crosstabulation with percentages and Chi-square to test among different groups of different individuals for the nominal variables. The Mann-Whitney rank-sum test and Kruskal-Wallis statistics were used when testing the ordinal variables that consisted of two and three different groups with different individuals. The Likert scale results were based on: each of the five responses has a numerical value ranging from 1= strongly disagree, 2= somewhat disagree, 3= neither agree nor disagree, 4= somewhat agree, and 5= strongly agree. The values were recoded to become binomial variables ranging from 1= disagree (includes the original values 1&2 – somewhat disagree and strongly disagree) and 2= agree (includes the original values 4&5 – somewhat agree and strongly agree). Value 3 neutral (neither agree nor disagree) and missing values were excluded from the analysis.

## Ethical Considerations

The qualitative and quantitative parts of the study have been approved by the ethics committee of the Faculty of Health Sciences in the Ben-Gurion University (BGU) of the Negev.

# Results and Discussion

## Findings and Description of Qualitative Results

The qualitative interviews involved 23 nurses, physicians and nutritionists representing the MOH, UNRWA and NGOs form the West Bank, Jerusalem and Gaza. Table 1 summarizes the main demographic and clinical background of interviewees:

|  |  |  |
| --- | --- | --- |
| Table 1: Demographic and clinical backgrounds of the interviewees | | |
| Characteristics | **Number of participants (n=23)** | |
| Gender | **Male**  **Female** | **13**  **10** |
| Profession | **Physician**  **Nurse**  **Nutrition** | **9**  **11**  **3** |
| Area | **West Bank**  **Gaza**  **Jerusalem** | **12**  **8**  **3** |
| Affiliation | **MOH**  **UNRWA**  **NGOs and others** | **11**  **8**  **4** |
| Management level | **Top senior management**  **Middle managers**  **Care providers** | **4**  **4**  **15** |

Each interview lasted 30-40 minutes, and all interviews were recorded. All interviewees were asked to respond to the same questions and, in some cases, they were asked to give more clarifications of ideas they mentioned. The main themes of the interview guide were based on the WHO health system framework and the six-health system building blocks: *service delivery, health workforce, information, medical products vaccines technologies, financing, and leadership and governance*. The NVivo 12 Pro software was used to code the main themes. Nevertheless, sub-themes were added whenever the need was aroused in the process of the research. When a new idea was raised by an interviewee not directly related to the six building blocks, the new theme was added on the software. The main themes related to the WHO health system framework are summarized hereunder in table 2.

|  |  |
| --- | --- |
| Table 2: Themes and sub-themes related to the WHO health systems building blocks | |
| WHO building block | **Themes / Sub-themes** |
| 1. Service Delivery | * Comprehensive services * Multiple providers * Guidelines and management protocols * Multi-disciplinary approach * Infrastructural capacity * Access to services * Referral system * Permit system |
| 1. Health workforce | * Lack of specialized teams * Diabetes training and knowledge * Job security, description and satisfaction * Access to clinics and training * Division between West Bank ang Gaza |
| 1. Information | * Lack of data / electronic medical records * Diabetes education and awareness * Research |
| 1. Medical products and technology | * Lack of medical equipment and supplies * Availability and price of medication * Glucometers and testing strips |
| 1. Financing | * Health budget * External aid and donor issues * Retained revenue (Israel) * Poverty and income * Health insurance |
| 1. Leadership and governance | * Policies and strategic planning * Legislations * Internal conflict and division * Corruption and mismanagement * Politicization of health intuitions * Control over the health system |

At the end of each interview, I asked participants to give their own views and perspectives on the healthcare system priorities and the reform agenda. Almost all participants have mentioned issues related to strengthening the primary health care system and give priorities to funding to the system to act as a gatekeeper for the patients referred to hospitals. Access to certified training courses for the healthcare professionals was believed to be an important step towards the improvement of diabetes services and to increase the professionals’ self-confidence and satisfaction. A senior manager in the MOH stated: *"****I am optimistic that our people are well educated and understand the issue if Non-Communicable Diseases (NCDs). I am also optimistic about the new training system, quality system, and the administrative and governance system. We fully understand the challenges and put the plan forward to rebuild our health system in a good way. A big task is to publish the national protocol and ask UNRWA, NGOs to use it. Our strategy of 2017-2022, is an excellent way forward to reform our health system, but we need to finance it …. Primary health care should act as a "gatekeeper" before going to the secondary level of the medical care. We already started training "family physicians" to take this role.*** ***That’s what I mean by the need to have a structural change than what is currently existing in the health care system".*** In addition, another senior physician from Gaza also elaborated: ***"I call on our politicians to unify their efforts so we can build and reform our health system. Reconciliation between Fatah and Hamas is of great importance, then we need to operate a health system away from politics. There are innovative ways to train our family physicians. Technology is now prevailed and could not be stopped by the checkpoints or the siege on Gaza. We need certified courses that encourage physicians’ enrollment that should be linked to a system of incentives".***

## Findings and Description of Quantitative Results

I received 517 surveys of which 422 responses had received by Qualtrics and 95 hard copies from rural areas in Gaza and the West Bank. 392 (75.8%) of the surveys fulfilled the criteria of participation in the research, and used for analysis. The data was exported to SPSS. The missing data in categorical variables were identified by the number 9. The missing values were replaced in continuous variables using the series mean method when there was less than 5%; while in categorical variables were excluded from the analysis. All variables were recorded to dichotomous variables for the cross-tabulation analysis. The study involved 392 healthcare professionals who met the inclusion criteria and were included in the analysis. The mean age of participants was 42.88 years (SD=10.788). Of the study population, 51% were females, with 10.85 years was the mean year of experience working in diabetes (SD=7.72). Table 3 summarizes the description of the participants.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 3: description of the participants in the quantitative survey | | | |
| Variable |  | **N (%)** | **M (SD)** |
| Age |  |  | **42.88 (10.735)** |
| Age (recoded to nominal variable) | **< 40**  **>40** | **151 (38.5)**  **241 (61.5)** |  |
| Gender | **Male**  **Female** | **192 (49)**  **200 (51)** |  |
| Basic education | **Medicine**  **Nursing**  **Nutrition and others** | **122 (31.2)**  **222 (56.8)**  **47 (12)** |  |
| Basic Education (recoded to nominal variable) | **Medicine**  **Nursing and others** | **122 (31.2)**  **269 (68.8)** |  |
| Employer | **MOH**  **UNRWA, NGOs and private** | **197 (50.4)**  **194 (49.6)** |  |
| Clinic/Service Location | **West Bank**  **Gaza** | **278 (71.6)**  **110 (28.4)** |  |
| Years of experience in diabetes care |  |  | **10.85 (7.72)** |
| Years of experience in diabetes care | **<10 years**  **>10 years** | **178 (45.4)**  **214 (54.6)** |  |
| How experienced you are in diabetes care | **No or little experience**  **Experienced/very experienced.** | **109 (27.8)**  **283 (72.2)** |  |
| Did you complete formal diabetes training? | **Yes**  **No** | **96 (24.6)**  **294 (75.4)** |  |
| Do you have additional work? | **Yes**  **No** | **122 (31.1)**  **240 (60.7)** |  |
| In your opinion, what is the percentage of diabetes control in Palestine | **<20%**  **>20 %** | **144 (36.8)**  **247 (63.2)** |  |

In addition, participants in the quantitative survey were asked to prioritize actions and strategies to develop and reform the Palestinian healthcare system according to their own perspective. The following is the priority list I have got from the participants:

1. Capacity Building: 97.8% of the participants in the survey stressed the need to improve the capacity of healthcare professionals. They have asked for well-planned and certified training programs.
2. Universal Health Coverage: 96.5% of participants agreed that the health insurance scheme should be changed and be adopted to the Universal Health Coverage as per the recommendations of the WHO, and the commitment of Palestine to achieve the Strategic Development Goals (SDGs).
3. Investment in Primary Healthcare (PHC): 91.3% of the participants called for more investment in the primary healthcare system. PHC should be given priority funding in the health budget and to be funded by more resources to strengthen the system.
4. The Need for Health Legislations: 90.7% of the participants highlighted the importance of health legislations and the formulation of health policies that can promote the healthy life style and health promotion.
5. Specialized Diabetes Clinics at PHC: 88.2% of participants recommended the need to establish specialized diabetes clinics within the primary health care system in all health districts.
6. Unification of Diabetes Management Protocol: 85.3% of professionals who participated in the survey have agreed on the importance of unifying management protocols between all providers to avoid the duplication of services, and to give more trust to the healthcare system
7. Provision of New Medications in the Clinic: 84.7% of the participants have agreed on the need to provide the new generations of diabetes the medications needed. The essential drug list is too old and in need for updates to include the new medications.
8. Task Shifting/Sharing: 79.8% of the participants agreed to adopt strategies of task shifting/sharing in the PHC and give the nurses more responsibilities on the provision of comprehensive care to diabetes patients.
9. The Need for Incentives: 77.7% of the participants have agreed on the importance of the adoption of a system for incentives that lead to more job satisfaction. Incentives are not necessary to be solely as financial incentives. It could be other kinds of rewards.
10. The MOH as an Overall Coordinator of Health System: 75.1% of participants agreed that the MOH should act as an overall coordinator of the healthcare system. I think the low ranking of this strategy is related to the challenges faced by the MOH in terms of good governance and the political division between factions.

## Results and Discussion: Healthcare Providers challenges

The Palestinian Healthcare System is a mixture of governmental, non-governmental (NGOs), United Nations Relief and Works Agency (UNRWA), Palestinian Military Medical Services (PMMS), and private (profit and nonprofit) services delivery. These health providers provide an overlapping services and none of these sectors deliver comprehensive health services [29]. The Palestinian Ministry of Health (MOH) bears the heaviest load of the health services responsibilities. It provides all related primary, secondary and tertiary healthcare for the entire population. UNRWA, which is the second healthcare provider, provides services at the primary level of care to registered Palestinian refugees only. In this chapter, I will use the WHO health systems building blocks to analyze and compare health services among the main national providers i.e., the government sector represented by MOH and Military Medical Services (MMS) in one side and UNRWA together with NGOs and other providers on the other side. The WHO building blocks and the related arguments that will be discussed in this chapter are: service delivery, health workforce, medical products and technology and medical information.In the service delivery section, my arguments are: despite the variations between different providers of diabetes services, both the main providers to diabetes care in Palestine do not provide comprehensive services. Diabetes guidelines and protocols are either not present or fully implemented in the vast majority of the MOH and UNRWA clinics. The Palestinian healthcare system does not have unified diabetes protocols which will add to the fragmentation of diabetes services. The health workforce in both MOH and UNRWA suffers from shortage, training of human resources and a lack of clear job description. Such environment has led to severe job dissatisfaction and brain drains. In the section of medical products and technology, research arguments are that diabetes healthcare providers suffer from lack of equipment, supplies, shortage of medications, and inability to provide the machines and testing strips necessary for self-monitoring of blood glucose. Finally, in the health information section, I argue that a big gap detected between providers in both access to computers and electronic medical records. Such a gap has negatively influencing the quality of health data and clinical research.

### Service Delivery

Service delivery is the “what and how” healthcare is delivered in a given context. Good health services as defined by the WHO, are those that deliver effective, safe, high-quality personal and public health interventions to those who need them, with minimum waste of resources [26]. It should also provide a comprehensive range of services from health promotion, prevention, curative, palliative, and rehabilitation [8]. Services may be delivered in the home, the community, the workplace or in health facilities [25]**.** In this section, I will discuss two of the important sub-themes that have been found to have immense implications on the delivery of diabetes services in Palestine:

1. The provision of comprehensive diabetes services, and

2. Diabetes care guidelines and protocols.

The subthemes have been raised by the majority of Palestinian professionals interviewed; and confirmed by the results of the quantitative survey. The importance of the sub-themes comes from their importance in the provision of high-quality diabetes care and the improvement of diabetes control within the context of Low Middle Income Countries (LMIC) the Palestinian health system operates.

#### The Provision of Comprehensive Diabetes Services

The comprehensive nature of diabetes care needs to include management of different elements of diabetes itself, e.g., specialist consultations for eye screenings or care, as well as the joint management of diabetes and other unique conditions the person may have. Theoretically, Palestinian providers are aware and willing to implement the comprehensive care, but not within the context of the public health system. In practice, the care provided is poor and focus mainly on medication prescriptions. The first strategic objective in the national health sector strategy 2017-2022 was "to ensure the provision of comprehensive health services to all Palestinians, heading towards localization of health services in Palestine" [61]. Interviewees from both MOH and UNRWA admitted that they did not implement comprehensive care in the public system. They raised issues of work overload, time restrictions, lack of specialties in diabetes care and multi-disciplinary team spirit. One MOH nurse stated: ***"… our patients ended up going to private centers because they know the government clinics don’t meet their needs. Our clinic is always very busy with big number of patients. I do not have time to sit with patients and educate them on diabetes and complications. I have to take care of diabetics and other patients come to our clinic in addition to the other tasks that have nothing to do with direct patient care … It is impossible to implement comprehensive care with the current clinic setup".***  A Physician from UNRWA explained: ***"At my clinic in UNRWA, patients are non-compliant to treatment; they have many complications and comorbidities. If we have a complete trained team present to provide comprehensive services for diabetes patients, then the control rate would be much better. Nurses would be better qualified for treating diabetes if they have good experience. I am sure if we have nutritionist in our team, that would be very helpful…. It has happened many times where patients would take different advice on how to control their diabetes, and this creates a problem, because the person gives the information doesn’t have the knowledge on how to deliver or communicate these messages. The big problem that we have is the constant increase in the number of patients. As a physician in the clinic, I have to treat and follow-up on other patients not only diabetics. I could not give enough time to my patients. In the UNRWA clinics, we see around 90 patients a day… Diabetics should receive complete package of comprehensive services".***

The quantitative survey in my study showed that one third of professionals in UNRWA and only 17% of professionals from MOH agreed and already provided diabetes comprehensive care services in their clinics. The difference was statistically significant (X2 = 31.517, df=1, p <.001). About the same percentage of professionals agreed they already provided diabetic foot services; 18.2% and 26.8% from MOH and UNRWA respectively (X2 = 15.478, df=1, p <.001). While, more professionals 27.1% from MOH and 37.8% from UNRWA agreed and performed HbA1c (Glycated Hemoglobin A1c) at their local clinics (X2 = 22.314, df=1, p <.001). The same percentage of professionals from MOH, 27.1%, and 32.1% of UNRWA, agreed they provided the prescribed diabetes medications form their local clinics (X2 = 6.2, df=1, p =.013). Only 16.6% of MOH, and 32.6% of UNRWA agreed they found enough time to discuss diabetes care plan with their patients (X2 = 36.496, df=1, p <.001).

Trying to deal with some of these challenges, the Palestinian health system has adopted initiatives to provide some sorts of comprehensive care. UNRWA has adopted a family-centered approach [62] as recommended by the WHO [44]. where, each family is assigned to a specific multidisciplinary family health team, staffed by doctors, midwives and nurses. They provide services horizontally according to the health needs of the family [15]. It is believed that the newly adopted approach has helped in reducing the overall workload on medical officers and Primary Health Care (PHC) services. This has been achieved mainly through the shifting of some preventive tasks from medical officers to nurses; such as authorizing nurses to approve monthly refills of medicines for controlled Non-Communicable Diseases (NCD) patients. The family practice model promotes improved prevention as well as early detection and management of NCDs. It enables health workers to work closely with people with high risk of developing NCDs and treat them in the early stages of a disease, thereby preventing the disease from progressing or developing complications [44]. In addition, UNRWA introduced an appointment system that resulted in evenly distributed workload for all health staff at health centers [32]. 35.1% of UNRWA professionals agreed they implemented appointment system in their clinics, compared to 18.4% from the MOH (X2 = 40.347, df=1, p <.001). The Agency’s internal assessments reported widespread satisfaction with the new family health team approach among both providers and patients [62]. To show impacts, UNRWA reported significant decrease in the number of medical consultations per physician per day from 99 in 2013 [63] to 78 in 2019 [32].

With support from WHO, the MOH adopted the implementation of Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings [64]. The WHO-PEN is the minimum standard for NCDs to strengthen national capacity to integrate and scale up care of heart disease, stroke, cardiovascular risk, diabetes, cancer, asthma and chronic obstructive pulmonary disease in primary health care in low- resource settings[65]. It defines a minimum set of essential NCD interventions for countries that wish to initiate a process of universal coverage reforms to ensure that health systems contribute to health equity, social justice, community solidarity and human rights [64]. In 2013, the MOH implemented a pilot project for the PEN approach in 14 primary care clinics in Salfit District, West Bank. Six months later, an assessment was performed. It showed that patients perceived positive changes in the quality of NCD services since the introduction of the PEN – such as: having a more thorough physical examination by a doctor, more time with the doctor, perceived improvement in prescription of drugs, and better organization of laboratory tests [29].

Another model was implemented by Augusta Victoria Hospital (AVH) in 2003 called Diabetes Comprehensive Care Model (DCCM). The DCCM provided an alternative approach to the prevailed biomedical approach (i.e., physician-centered, focused on prescription of medications). The DCCM required that existing diabetes treatment procedures be unified into best practices protocols encompassing a holistic approach that focuses on the whole person; and modified for the local context in Palestine [10]. With the DCCM, the patient plays a central and active role in diabetes self-care and management. A multi-disciplinary team of clinicians provides comprehensive diabetes care including: lifestyle management, physical activity and exercise, nutrition, foot care, eye screening, individual and group counseling, standardized diabetes laboratory testing, patient, family and community education; home visits, prevention and care of complications [12]. The implementation of the comprehensive program through the DCCM, reduced HbA1c by 0.8% over one year of follow-up (n = 500). Another study showed statistically significant decrease in HbA1c for those who received the DCCM intervention, compared to the control group received regular diabetes services by MOH clinics [10]. It was confirmed by the International Diabetes Federation (IDF), that structured and team-based care, multi-disciplinary and patient-centered, improve clinical outcomes compared to usual care. Models focusing on self-management, task-shifting among professionals, ongoing support and the use of role play to promote patient–provider communication can be cost-effective in some settings [2].

In summary, the provision of comprehensive diabetes services within the context the Palestinian healthcare system operates is possible. The positive experiences and related achievements through the implementation of family health approach by UNRWA, PEN approach by MOH and DCCM by AVH showed better control over diabetes, and more patient satisfaction. MOH should take the lead and re-organize diabetes care to adopt the concepts of comprehensive approach.

#### Diabetes Guidelines and Management Protocols

National, evidence-based guidelines, protocols and standards for the management of diabetes are important tools in achieving a standardized and consistent management approach and improving quality of diabetes care [1]. Guidelines cover basic principles of diabetes management: Interventions to promote and support healthy lifestyles; medication for blood glucose control and other comorbidities; regular exams for early detection of complications; and standard criteria for referrals. Most guidelines use the standard diagnostic criteria proposed by the IDF and WHO[2]. Less than half (46%) of low-income countries reported fully or partially implementing diabetes management guidelines. The same case was reported in Palestine where the Palestinian healthcare system was lacking diabetes care protocols and the unification of services through these protocols.

In my research interviews, almost all respondents indicated that the lack of unified protocols in diabetes management makes it difficult for them to follow-up on patients. Not only because patients switch providers but also because they end up having “poly-pharmacies”, where they are prescribed different medications and received conflicting recommendations depending on the provider they visit. The MOH physician has mentioned: ***“So long we lack the presence of the work protocols, especially to do with diabetes patients and how to deal with them, and even other types of patients. It's all non-existent and it's all up to personal judgement. It will vary from one health care provider to the other”.***

It was confirmed by quantitative survey that the lack of national diabetes care protocols to unify diabetes care in Palestine is considered a great challenge. The survey showed that only 20.4% of MOH and 37.8% of UNRWA professionals agreed they implement diabetes protocol in their local clinics (X2 = 45.334, df=1, p <.001), and only 10.1% of MOH and 21% of UNRWA professionals agreed they receive direct feedback from other health facilities when they refer patients for consultation or to do certain procedures (X2 = 22.681, df=1, p <.001).

The MOH and UNRWA have developed and adopted guidelines for the management of diabetes. The MOH guide is devoted to the management and care of diabetes mellitus, while the UNRWA guide has technical instructions and management protocols on the prevention and control of noncommunicable diseases [29]. Both protocols are based on the WHO diabetes care guidelines with some differences between the two protocols, and sometimes between them and the WHO guidelines [66]. In addition, they lack unification and standardization[33]. Clinical evidences did not show that these guidelines are incorporated into the daily practices of Primary Health Care (PHC) staff. The overall adherence levels to the diabetic clinical guideline were disappointingly suboptimal within the MOH and UNRWA [29]. Earlier studies showed that only half of the physicians and one-third of nurses were familiar with local guidelines at their disposal. Around half of the physicians and nurses did not adhere to the available Palestinian diabetes guidelines [66]. This creates big challenge to the healthcare system to provide proper diabetes services and increase patients control over their diabetes. The analysis identified a wide range of barriers against the adherence to guideline for Diabetes Mellitus (DM) within the MOH and UNRWA. The environmental-related and guideline-related barriers were the most prominent factors influencing the guideline adherence. In MOH, the most perceived barriers to guideline adherence were lack of reimbursement, lack of resources and lack of the guideline trustworthiness; whereas the time constraints and the lack of the guideline trustworthiness were the most prominent barriers in UNRWA [67]. In addition, many professionals had contributed this to lack of interest, time constraints and work overload; lack of incentives, lack of resources for laboratory testing, outdated guideline, lack of clinical audit and feedback; and lack of training on how to apply the guidelines in addition to organizational culture in both MOH and UNRWA [29][66][33]. A senior MOH manager has attributed this to the fact that there are many providers, and the MOH does not take its role as the overall responsible and organizer to the healthcare system in Palestine. This senior has stated that: ***"… Having different systems and protocols in the same country is one of the obstacles as well. In my point of view, unifying these protocols under the umbrella of the MOH is the best option, and that’s what is common in many countries around the world. The MOH should be the initiator and the organizer of the health system. But we have obstacles in overcoming this in our case, because of having different parties that fund (financially support) the health sector. UNRWA is not under the MOH’s mandate. This is an obstacle, but this does not imply that each one works as they like. There must be an umbrella covering this, which is the MOH".***

In summary we see that diabetes guidelines and protocols are not present or implemented in the vast majority of the MOH and UNRWA clinics. Diabetes protocols are not unified in all providers. This creates an environment where healthcare professionals do not adhere to the available treatment instructions and patients receive conflicting consultation and educational instructions; and medications.

### Health Workforce

Health workers, according to the WHO, are all people engaged in actions whose primary intent is to protect and improve health [25]. A well-performing health workforce is one that works in ways that are responsive, fair, and efficient to achieve the best health outcomes possible, in view of available resources and circumstances i.e., when there are sufficient numbers and mix of staff fairly distributed; when they are competent, responsive, and productive [25][54]. Countries have enormous variation in the level, skill and gender-mix in their health workforce. Overall, there is a strong positive correlation between health workforce density and service coverage and health outcomes. Palestinian healthcare system suffers from the shortage and training of human resources [18]. There is an instant increase in demand for qualified health human resources in the different fields to assist in achieving nationalization of health services in Palestine and establishing quality services; and consequently reduce referrals abroad to the minimum [13]. In this section, I will discuss the following sub-themes that came out from the qualitative research and confirmed by the quantitative survey:

1. Shortage of human resources and lack of specialties;

2. Training and education; and

3. Job description and satisfaction.

#### Shortage of Human Resources and Lack of Specialists

In Low Middle Income Countries (LMIC), there are acute shortages of skilled health workers in the public health systems [29] [26]. Considering how frequent the issue of lack of resources raised by the MOH and UNRWA professionals, it is not surprising that almost all respondents reported lack of specialists in diabetes care and its impacts on the quality of care provided to diabetes patients. This shortage of specialists prevents the creation of multi-disciplinary teams able to provide comprehensive services for diabetes patients. In diabetes care, the need for diabetologists, endocrinologists, podiatrists, nutritionists, orthopedic, ophthalmologists, and vascular surgeons is extremely urgent given the high prevalence of uncontrolled diabetes. The complications that arise due to prolonged hyperglycemia result in long-term manifestations that significantly affect the quality of life of patients.

Patients in need of specialized diabetes care are referred to hospitals, or private clinics. One nurse from UNRWA declared: ***"… There is a shortage amongst all health departments in human resources such as dieticians who provide information on diabetes and its complications; eye and foot specialists to screen and manage eye problems and foot inflammation, and provide proper care of the foot. So, we constantly lack specialists who would educate the patients on how to deal with a healthy foot and an otherwise unhealthy one".*** Another MOH physician also stated: ***“Diabetes is a narrow-specialized field, as we say in medicine, so professionals should be specialized in it. First, diabetes patients need a specialized nurse, a diabetes specialist nurse, and this specialty is non-existent over here. All the nurses who work in the field are regular nurses who have neither capacity nor sufficient knowledge to deal with these patients. Also, diabetes patients need to have dieticians, and we also don't have this one as a specialty or training. We need a diet specialist for diabetes patients to deal with their daily lifestyle and provide them with the proper information”***

The results of quantitative survey have confirmed the lack of specialists in the Palestinian healthcare system as 21% of MOH and 28.3% of UNRWA professionals respectively agreed there are specialized physicians in their local clinic to provide diabetes services (X2 = 9.177, df = 1, p =.002). Relatively the same percentage of professionals agreed that they have specialized diabetes nurses available at their local clinics to provide diabetes care (X2 = 6.762, df=1, p =.009). While 10.5% form MOH and 28.2% of UNRWA professionals agreed they have nutritionistsavailable at their local clinics to provide diabetes services(X2 = 45.237, df=1, p <.001); and only 8.7% of MOH and 13.2% of UNRWA professionals agreed that they have podiatrists (diabetic foot specialist) in their clinics **(**X2 = 3.584, df=1, p =.058)**.** The International Diabetes Federation (IDF) has stressed on the importance to increase human resources in diabetes care. This increase does not only include specialists, but also generalists, nurses and other health personnel [2]. The MOH and in cooperation with the WHO and the World Bank has recently established Human Resource Observatory to collect and report all information regarding health professionals[68]. Such step will help to identify health workforce challenges and gaps, design strategies for improvement, allocate the workforce geographically, and develop informed health policies [68]. Traditionally, much of the WHO’s focus in countries has been on training, especially in-service training. Recently, the WHO has mobilized greater international awareness of health workforce shortages and performance challenges [25]. The MOH and UNRWA professionals suggested recruiting more doctors and nurses to overcome the shortage in human resources. They also have requested to hire more specialists within the Primary Health Care (PHC) system such as endocrinologists, diabetes nurses, psychologists, vascular surgeons and dieticians in order to overcome this challenge [67].

In summary, health human resources are the backbone of the healthcare system. Shortage in certain specialties and maldistribution of human resources is considered one of the big challenges that need to be addressed, studied and solved. The Human Resource Observatory report provides a guideline for valuable information on the situation of health human resource for health leaders and policy makers to decide on the number and the type of specialties needed.

#### Training and Education

Training and education encompass the availability of trained staff to provide specialized care to diabetes patients and the opportunities to continuously improve quality of services. Diabetes demands a unique knowledge-base and skill set from staff members with specific training [69]. Most respondents were very frustrated by the lack of mandates to ensure continuous medical education. They expressed their desire to have access to advanced research, training methods and skills to better serve their diabetes patients, but noted the lack of capacity building in that aspect. One MOH physician said: ***"… As I told you, the staff isn’t trained and specialized, and I know how to dress, but I would like to know how to follow up and so on. My knowledge is only from what I took from university, and there is no updating of information, there are some cases of CVA (cerebrovascular accidents) that we do not know how to deal with; and don’t forget the psychological effects of this, and we need to know how to deal with them”.***

In addition, quantitative survey has showed that only 10.8% of MOH and 23.6% of UNRWA professionals agreed they have continuous training program that allows to gain expertise in diabetes care (X2 = 26.649, df=1, p <.001). In the study conducted by Sharif N. et al found only 32.7% of Palestinian professionals reported having had training on diabetes guidelines [66]. Health workers improved their knowledge by reading books on advanced practice methods while some even incurred personal charges by attending conferences overseas. However, these forms of training were based mostly on individual initiatives, and were not part of a systematic program of continuous medical education. A physician from NGOs stated: ***“When I would go to medical conferences I need to travel and pay a lot of money…, but here it is very rare to attend medical conferences to learn from other experiences”.***

The clinicians’ lack of knowledge about recent evidence-based guidelines may affect the diabetes care outcome. In particular, physicians are uncertain about when to start insulin and which and how much insulin they should use [70]. Diabetes doctors often expressed that they were “scared” of managing diabetes due to lack of training to understand and manage comorbidities [8]. For example, in Zambia, only 9 % of healthcare workers had received any form of special training in diabetes and only 33% felt sufficiently trained to treat a patient with diabetes. A cross-sectional survey in Sri Lanka found gaps in knowledge and management of diabetes in general practitioners. In addition, many countries face lack of additional human resources for diabetes, such as trained podiatrists or nurses [8]. The WHO redesigned the training programs to produce the spectrum of health workers to deliver health services. It will explore and document ways to maximize the use of priority program training initiatives and mechanisms, such as accreditation to assure quality of training [25]. Clinical training based on context-adapted protocols should be supplemented with on-the-job training when possible, with onsite clinicians available to train and supervise [69]. Such training model, has showed good results and positively impacted diabetes control in Palestine [10]. Team-based and integrated diabetes care requires reforming the training curricula of physicians and nurses to accommodate their changed roles and to promote collaboration [41]. The effectiveness of extensive training courses offered to certain health providers where the criteria for selection of participants; the training methods utilized (primarily in the classroom rather than on-the-job); and the supervision and follow-up in the field, require further consideration [16]. Strengthening the performance of health systems depends on more than just increasing the numbers of health workers; actions for assessing and strengthening their recruitment, distribution, retention and productivity are important as well. Actions may include: adopting new approaches to pre-service and in-service training; strengthening workforce management; establishing or improving incentives for addressing distribution and retention challenges; or task-shifting (delegating tasks, where appropriate, to less specialized health workers) [45]. Task shifting has shown much success for the management of conditions such as HIV/AIDS; not only for patient support and education, but also for treatment. In many settings, and due to frequent shortages of clinical staff, the adoption and implementation of such approach for diabetes care are essential and urgent [2]. UNRWA’s primary healthcare reform is designed to have a family-centered perspective. Task shifting is a major pillar of UNRWA’s reform where diabetes and Non-Communicable Diseases (NCD) services are mainly provided by nurses and midwives, aided by carefully designed guidelines [62]. In addition, UNRWA acknowledges the importance of providing on-going training and continuous professional development to its staff aiming to improve the quality of health care services provided to Palestine refugees. UNRWA partnered with the Rila Institute of Health Sciences in the United Kingdom, tailored a 12-month training course on Family Medicine for UNRWA medical officers [32]. This program was called the Family Medicine Diploma Program (FMDP). The program provides clinicians with an in-service model of training that they can enroll into without the disruption to their daily work. The model is designed to build on their existing knowledge, skills and experiences, and to improve their mastery of patient clinical management and high standards of clinical care.

The use of telemedicine system, with which field clinicians have remote access to a wide range of specialists for rapid clinical support; remote support can be useful [69]. There is potential for telemedicine to help deliver health services and training in areas where practice skills, transportation, facilities, and providers are limited or in isolation [71]. The MOH, and in its 2017-2022 strategy seeks to advance the skills of health sector personnel, introduces continuing education and e-learning programs and keep pace with regional and global scientific and medical advancements through institutionalizing training programs; establishes e-libraries in several public hospitals; uses telemedicine project to enhance the skills of professionals and continues efforts to host internationally recognized medical delegations with specialists in needed medical fields [13]. The Diabetes Comprehensive Care Model (DCCM) model implemented by AVH used a mobile healthcare truck equipped with a digital retinal camera, electrocardiography (ECG), Doppler, biothesiometry, to screen for the complications of diabetes; and performed on-the-job training of local staff, proved to be efficient and effective in diabetes control and improved capacity of front-line professionals [10].

In summary, continuous training and capacity building of healthcare professionals are an important and integral part of health system development and reform. It is an urgent requirement that the MOH and UNRWA, in cooperation with all other providers and stakeholders, to work together to advance the skills of health sector personnel; introduce a focused and well-planned continuing education and e-learning programs to keep pace with clinical needs, regional and global scientific and medical advancements. On-the-job capacity building and coaching are good strategy used in low resource countries and proved to be efficient and effective in Palestine that could be more developed. Telemedicine and e-learning is a strategy that needs more investment in infrastructure, awareness, planning and policy the health system can utilize in an efficient and effective way.

#### Job Description and Satisfaction

Clear job descriptions and high level of employee satisfactions are cornerstones to instill and improve dedication, commitment and quality of care. Most providers interviewed in my research found themselves assuming roles that were outside their scope of practice especially due to the lack of human resources. Moreover, some providers feel that they are under pressure to provide the comprehensive treatment package for diabetes patients including the roles usually performed by social workers and dieticians. A senior nurse from the MOH has declared: ***“I am always demanding that we have job descriptions, and if I am only working as a nurse, then I would give the patient their full rights, but if I am doing something else, the nursing would become secondary. The nurse works as records keeper and gives meds. That way the nurse won’t be able to work properly”***

A Diabetes specialist physician form the MOH indicated: ***“We also try to fill up spaces. For example, as a diabetes specialist, sometimes I'm asked to fill in at a neurological clinic! But that's not my expertise! They say to me we'd like to fill up this space...”***

The quantitative survey revealed that only 14.6% of MOH and 33.4% of UNRWA professionals agreed they have clear job descriptions as it was statically significant (X2 = 45.554, df=1, p <.001). In addition, 16.4% of MOH and 36% of UNRWA professionals agreed that the daily tasks they performed fit their job description (X2 = 42.580, df=1, p <.001). Only 8.8% and 28.7% of the MOH and UNRWA professionals respectively agreed they were satisfied with their work salary/financial incentives (X2 = 56.463, df=1, p <.001), and 19.9% of MOH and 36.9% of UNRWA professionals were satisfied with work duties/work schedule (X2 = 34.353, df=1, p <.001).

Lack of job satisfaction and motivation were identified in literature as major gaps identified in health systems and in Low Middle Income Countries (LMICs) in particular [54]. Earlier study had showed that there was a general consensus among the MOH and UNRWA healthcare providers that the lack of incentives was a key barrier against the adherence to diabetes guidelines [67]. Participants reported that the monetary incentives were totally missing. Some mentioned that the deteriorated political and economic conditions in Palestine compelled the government towards freezing any decision related to payment system or job promotion. On several occasions during the past years, public sector health workers were not paid their salaries on time or they only received partial payment. Delays in salary payment have resulted in large-scale strikes, with serious implications on service delivery [21]. Many compared the monetary incentives of the UNRWA and the MOH, and believed that the UNRWA staff were more motivated due to the higher salaries [67]. Moreover, they reported that the distinguished staff receive different kinds of incentives such as bonuses, annual awards or appreciation letters. In contrary to UNRWA, there is a perceived lack of stable career paths in the public sector and the fragmented institutional framework of the Ministry of Health and the absence of a well-defined and managed human resource development strategy that hinders the overall development of MOH human resources [21].

In its recent strategy, the MOH has planned to enhance health workers’ satisfaction and adopt national health policies to protect health workers and secure their rights by finalizing and applying job description system for all technical and administrative categories of personnel; and orientation of staff members on their responsibilities and duties as outlined in their job descriptions [13]. On the ground, the MOH professionals did not see the implementation in their clinics. A nurse from the MOH stated: ***"generally, most of the staff are frustrated due to low salaries and lack of incentive. How can employees be committed to provide the care according to the guideline recommendations while they are demotivated? In our system, we receive only a fixed monthly salary, despite how many patients you see or services you provide. The current salaries are quite hard to satisfy our basic needs …"***

It seems sensible to deeply analyze what could motivate the Palestinian healthcare professionals. The Palestinian national payment method and the incentive scheme should be carefully reviewed and redesigned taking into account the monetary and non-monetary incentives for health professionals.

### Medical Products and Technology

Health systems need to guarantee equitable access to medicines and other technologies, which are of assured quality, safety, efficacy, and cost-effectiveness; and ensure that these are used in an evidence-based and cost-effective manner [25]. For an effective management of diabetes, steady supply chains that can ensure the efficient distribution of specific medical products and technologies to health facilities or consumers over an extended period of time, are essential. In many LMICs, supply-management systems are weak with national policies, standards, guidelines, and regulations; and are often deficient [26]. This will result in stock interruptions of essential drugs and present a barrier to mounting a sustained and effective health programs. In this section, the following sub-themes have been raised by the research and will be further discussed:

1. Medication, equipment, and supplies, in addition to

2. Glucometers and testing strips, as home glucose monitoring equipment are scarce. Availability and affordability of such equipment, supplies and machines will definitely improve diabetes care and the management outcomes.

#### Medication, Equipment, and Supplies

Diabetes medication availability and affordability remain poor in most regions of the world, particularly in LMICs supply and use of diabetes medication posing a substantial challenge. In many countries, especially in economically disadvantaged families, access to insulin and self-care tools, including structured diabetes education, can be limited. This may lead to severe disability and early death as a result of harmful substances known as ‘ketones’ building up in the body (diabetic ketoacidosis, DKA) [2]. Public health systems in LMICs are frequently unable to provide access to appropriate injection devices and HbA1c testing for people with diabetes. Furthermore, the cost of private purchase is often prohibitive, even if these components of care are available. This compromises the level of care that can be provided. Many countries are currently reliant on international donations [72]. The lack of diabetes medications and the need to update diabetes drug lists were of great concern and mentioned by the majority of physicians and nurses in the MOH and UNRWA who participated in my research. New medications are not provided by health insurance. Patients have to buy them from private pharmacies. This adds an extra financial burden on patients and disrupts their treatment protocols. In the majority of cases, it was reported that patients will reduce the dose or stop taking those expensive medications by themselves. This will put them at high risk to diabetes acute and chronic complications. A physician from UNRWA expressed his serious concerns by stating: ***"Patients usually asked us to prescribe the new generations of insulin and oral tablets. We do not have them available in the UNRWA system. This causes problems for us regarding communication with the patient. If we were to talk about the differences between the old and new insulin, there are many, one is the ease of use, another is regarding insulin that gives very good results in regulating the sugar and the ability to control insulin of the patients which is better than the one we give them".***

Another physician from the MOH also explained***: "…******Some instruments and supplies are not available in the clinic. Laboratory tests are available only in central clinics. In addition, we have severe deficit in the availability of essential diabetes medications. I write prescription and ask patients to buy the medicine at his own expenses. When he comes next time, I discover that he did not use the medicine and even did not buy it. Hi blood sugar will be very high and diabetes is not controlled. Patient will be at a very high risk to develop complications".***

The quantitative survey showed that 12.3% of MOH and 29.1% of UNRWA professionals agreed they have all necessary equipment to provide comprehensive diabetes care (X2 = 37.384, df=1, p <.001). 22% of MOH and 38.1% of UNRWA professionals agreed they have the necessary disposable medical supplies available to provide comprehensive diabetes careat their clinics (X2 = 33.326, df=1, p <.001); and 44.6% of MOH and 37.3% of UNRWAprofessionals experienced shortage of medications/supplies at least once during the last year; significant (X2 = 4.427, df=1, p =.035).

The availability of medicines, equipment and other supplies depend on the available budget and related funds. In 2019, 15.5% of MOH budget has been expended on medicines, medical consumables and laboratory supplies. Less than 30% of these expenses had been expended on PHC, and 66% on hospitals [31]. In the same year, UNRWA spent US$ 15.4 million on medical supplies and equipment agency wide. Analysis of expenditure on different medicines revealed that 48.9% of the funds were spent on medicines used for the treatment of NCDs including the diabetes drugs. While medical equipment and related supplies accounted for 9.8% (US$ 1.5 million) of the total expenditure on medical commodities [32]; the budget allocated for medicines and supplies is relatively modest in both the MOH and UNRWA. Furthermore, it depends on availability of funds and project support. The Paris Protocol on Economic Relations, in formalizing an effective customs union with Israel, has implications for the affordability of medicines – and the affordability of health care overall – in Palestine. The Palestinian Ministry of Health overpays substantially for many medicines, comparing to international benchmark prices, where import restrictions comprise a major contributing factor to increased prices [73].

Through the national NCDs and drug committees, recommendations have been sent to the MOH listing the essential drug items to include new diabetes medicines and insulins. Unfortunately, and due to restrictions on budgets, the requests were not approved. Human insulin vials remain the cheapest option [69], but are more complex to use and might be challenging to use by children and patients with advanced diabetes complications. The support provided by donors and NGOs to supply some medicines is extremely important to try to compensate for the severe lack of medicines in the MOH and UNRWA. Since this process occurs through a direct contact between different providers and the patient without close coordination with the MOH, it turns out to cause more confusion and waste of resources. The MOH and UNRWA need to update their essential drug lists and to use a unified national management protocol to avoid the big burden of the cost and unavailability of medicines on diabetes patients.

#### Glucometers and Testing Strips

Glucose monitoring machines and testing strips are very essential tools for newly diagnosed diabetics, particularly for those with type 1 diabetes. In most LICs and LMICs, it is rare for individuals to have their own blood glucose meter. The availability and affordability of this necessary tool is an issue [8] due to its impact on diabetes control. The use of glucometer is a learning process that helps people understand the consequences of life style and how to adjust according to metabolic needs [35]. In Palestine, diabetes patients have to buy the home testing supplies by themselves and on their own expense, as they are not provided through health insurance [29] [34]. The vast majority of health professionals in both the MOH and UNRWA brought up this issue as a big challenge to diabetes care. An UNRWA nurse explained: ***"Diabetic children couldn't test their blood sugar levels at home because the glucose test strips are very expensive over here, and people here are poor so they're unable to purchase these strips. It made a big difference when we provided them with the test strips. As you know, patients should conduct these tests 4 to 6 times a day to ensure an acceptable level of glucose is in their blood. Hypoglycemia is very dangerous, it's more dangerous than high blood sugar, and therefore, making the glucose test strips available is very important for the patients".*** The quantitative survey has confirmed that only very small portion from both the MOH and UNRWA professionals agreed they provide glucometers and testing strips to their patients 4.5% and 14.1% respectively, (X2 = 19.377, df=1, p <.001). Most of the times, professionals try to help patients through their personal relationships with community or with companies that distribute the machine. UNRWA clinical audit had showed that 73.4% of patients were not using glucometers to measure blood glucose [35]. 50.3% and 60.9% of patients do not have glucometer and glucometer strips respectively; and only 9% of patients daily tested their blood sugar [34]. Relatively, about the same figures have been reported in Mozambique; as only 18 % of health facilities had urine glucose strips, 8 % ketone strips, and 21 % a glucometer [74]. The reasons behind this finding could be complex, but it seems the main reason was that both the MOH and UNRWA do not provide patients with glucometers and glucose testing strips as part of health insurance. Financial difficulties, the cost of glucose meters and their strips, poverty; lack of patient’s knowledge on the importance and how to perform the self-test; the lack of interoperability between different meters; and lack of education and recommendations by treating physician as well as the inconvenience of regular finger prick testing; could all be the major challenges facing diabetes patients to do the self-monitoring test. The use of inexpensive, non-invasive, field-adapted technology at point of care (POC) could be the future solution to this international challenge particularly in LMICs [72].

In conclusion, glucometers and testing strips should be provided free of charge by health insurance to all patients to guarantee the availability and affordability of this important test. At the same time, health professional training and patient/family diabetes education are critical for an effective, efficient and rational use of home monitoring of blood glucose.

### Health Information

A well-functioning health-information system is one that ensures the production, analysis, dissemination, and use of reliable and timely information on health determinants, health-systems performance, and health status [26]. Most LMICs do not have integrated health- information systems that can pull together information from such a range of sources, or link the various care providers to assist coordination along the care pathway. Reliable and timely means of communicating health information between patients and providers enhance self-management and motivate patients [41]. In this section, the sub-themes:

1. Availability of computers and electronic medical records and

2. Clinical research will be discussed and further elaborated. The importance of these sub-themes comes from the fact that in LMICs and in Palestine in general, health systems do not prioritize investment on clinical research and health information system.

#### Computers and Electronic Medical Records

There is insufficient investment in health information systems from either the government or other healthcare providers in Palestine. Palestinian healthcare lacks reliable information needed for designing proper health policies and strategies to fight chronic diseases. It does not have integrated health- information systems that can pull together information from such a range of sources, or link the various care providers to assist coordination along the care pathway. Most health professionals interviewed indicated that the lack of an integrated health information system across the health sectors prevents coordination among health providers and makes it difficult for them to properly follow-up on patients. This has led to an issue where diabetes patients have had their limbs amputated by a different provider even though management procedures had been outlined by the previous provider to prevent amputation. This is compounded by the lack of electronic medical records and data management tools which highly influence documentation of patient information, control status, prevalence of complications, and follow-up of cases. A physician from the NGOs stated: ***“there should be workshops that should be comprehensive between the specialized entities, especially with the NGOs and the governmental institutions, in order to work out coordination and other methods like an electronic file for the patient so that when the patient goes anywhere, their file would be right there, so that the doctor would not have to start from the very beginning and all over again, so he doesn’t have to go from A-Z with the patient, but instead the doctor would continue from where his colleague finished”.*** A MOH nurse also declared***: "I am the primary care provider in my clinic. A physician visits the clinic three times /week. We provide immunization and MCH follow-up. During the physician working days we see also patients with NCDs and diabetes. We refer most of the cases to the central clinic to get their treatment and laboratory tests. We do not have computer or internet. I use the paper file, which is a family file where all family members are recorded in it".***

The quantitative survey has revealed that 16.1% of the MOH and 35.8% of UNRWA professionals agreed that they have access to computers with internet for patient data (X2 = 48.235, df=1, p <.001). Only 10.3% of MOH and 34.5% of UNRWA professionals respectively agreed they use electronic medical record filing system at their clinics (X2 = 84.164, df=1, p <.001).

In 2011, UNRWA initiated reform of the structure of primary healthcare, designed to respond appropriately to the growing burden of NCDs among Palestinian refugees including the introduction of health information system (E-health) [62]. Currently, the system is operational across 96.0% of all UNRWA health clinics (HCs). Implementation of e-Health will continue to improve the quality of patient care in terms of swift access to medical records, improved appointment system, better flow of patients, strengthened supervision of health services, and enhanced monitoring and reporting capabilities [32]. The use of an e-Health-based cohort monitoring system helps to monitor NCD care in UNRWA HCs [75]. It enables comprehensive follow-up of NCD care, including incidence, prevalence, treatment compliance, control status of patients and lost to follow-up. Since UNRWA does not provide tertiary care, they will continue to face the challenge of communication with other care providers and hospitals. The patient has to bring printed reports to UNRWA clinic about his case and the treatment done outside the UNRWA system.

In the MOH system, the computerized information system was applied for patients’ medical files in eight public hospitals. The implementation is planned to continue for the remaining hospitals to ensure that all MOH hospitals are using the computerized system. Further, four health district directorates and four clinics are using the computerized health information system [13]. Work is also underway on implementing a computerized system for mother and child health and linking the MOH and the Ministry of Interior electronically with regard to reporting of births and deaths. There is still a long way to go in order to unify and implement the electronic medical file within the MOH systems i.e., PHC and hospitals. In addition, efforts are needed to link MOH, UNRWA and other providers. They need to agree on the system of sharing medical information to avoid the duplication of services, monitoring patient data and treatment outcomes. Improved health information system will give true figures for incidence, prevalence, and burden of NCDs to help in strategic planning and proper allocation of resources.

#### Clinical Research

Existing numerous studies globally revealed that there is an unequal distribution of resources for higher education and research in the world [76]. Due to significant gaps in the diabetes knowledge base, the WHO has prioritized research agenda for the prevention and control of diabetes and NCDs outlines key areas of diabetes-related research. There are enough research evidences for the effective interventions to improve management of diabetes and to reduce its modifiable risk factors [1]. The IDF calls to an urgent implementation of diabetes research to generate evidence to inform practices and policies, and make healthcare systems sustainable [2]. In many LMICs they have difficulties in building up their health research capacity to support effective national health research systems for better decision making. Some of these difficulties are:

\* Lack of qualified human resources and researchers,

\* Lack of research funding, and

\* Lack of infrastructural capacity.

In Palestine, health research is still lacking and major challenges persist [76]. Most studies performed in Palestine in the field are evaluative studies, and that there are no prevention or intervention studies focused on diabetes prevention or control [29]. It was very obvious from the interviews with professionals that clinical research was not on their agenda due to lack of training and resources; and they stressed the fact that their work environment is considered as a disabling environment for research. They complain of high workload, lack of time and training to do research. A nutritionist from the NGOs stated: ***“We had some initiatives to do research. It was part of a Danish project fund. It was not easy for me and the team; we were not trained on research writing, statistics or data management. It would be easier if we get training and to partner with universities. So far, we do not have any cooperation agreement with universities. Scientists prefer to work alone".*** Nurse from MOH has further elaborated on this issue: ***"There are simple figures we do not know. We do not have accurate diabetes prevalence and incidence data. All what we have is based on predictions. What we publish in our reports is the number of diabetes patient visits. When we talk with our managers about research, they tend to ignore and tell us that we have many priorities to do before we publish research. I think the most important need in this field is training and the funds".***

The quantitative survey has revealed that only 2.6% of MOH and 14.9% of UNRWA professionals agreed that they conduct clinical research at their clinics (X2 = 35.607, df=1, p <.001). While 6.9% of MOH and 22.6% of UNRWA professionals agreed with the fact that they collect quality indicators (clinical audit) at their clinics (X2 = 38.391, df=1, p <.001).

It seems that UNRWA has moved steps forward in implementing health research. UNRWA has recognized research as an important subject and implemented some research projects not only to supplement knowledge about health services provision to refugees in resource-limited areas, but also to enhance UNRWA’s transparency, accountability and visibility [32]. In 2019, UNRWA has established the first Research Review Board (RRB). The Health Department has updated its research priorities to meet the needs of the Palestine refugee population that are being served. The research priorities for the UNRWA health program align with the research activities highlighted in the World Health Organization (WHO) Health System Strengthening Framework, as well as the estimated current and future trends on disease burden [32]. These research priorities are addressed by the health department through four different types of research, namely:

1. Primary research,

2. Secondary research (including the analysis of e-Health data), literature reviews and policy analysis.

During 2019, UNRWA has published six articles at peer-reviewed journals [32].

The MOH and in cooperation with the WHO, established the Palestinian National Institute of Public Health (PNIPH) with purposes to play a key role in promoting health research, analyze health information and indicators, and participate in the development of various health surveillance programs. In doing so, the PNIPH provides the scientific evidence required to institutionalize strategic planning and national policymaking by decision-makers [13]. The national health strategy 2017-2022 puts goals forward to promote health research and make available evidence-based information for decision making and health planning.

Researchers recently published a paper to review challenges that face the health research in Palestine [76]. Human resources and infrastructural capacity were rated number one challenge. The research described the status of the health research human resources and infrastructure as generally experiencing a noticeable shortage. However, some experts pointed to plenty of qualified human resources, particularly in academia; but highlighted the fact that these are untapped and, as many experts alleged, not adequately trained. Government experts recognized the lack of research budgets where they called for a 5% of the central health budget to be allocated to health research [76]. Conversely, NGOs experts alleged that the national health strategy 2011‐2013 allocated 1% to health research, but other experts argued that this is unreal [77]. Other obstacles facing the health research correlated with the absence of a regulatory framework. Mis-management of resources, weak strategic leadership, duplication and individuality in health research efforts, brain drain; and insufficient experience and skills of the current human resource have been identified [78]. Others pointed to other factors such as lack of sustainable and national funds, political turmoil, time constraints, and lack of investment plans in infrastructure innovation and technological development in all sectors. The majority agreed on the centrality of having the political support to initiate a strategic dialogue to build a national health research body.

In summary, the findings indicate that a political commitment is essential to ensure sustainable financial resources for health research through possibly different channels, where the majority proposed solutions to tackle the financial scarcity of health research, such as:

\* Establish national fund under the MOH‐PNIPH joint patronage with proper resources allocation and management; and

\* Stimulating domestic financing and

\* Optimizing international funding on the basis of a long‐term strategic partnership to ensure the pillars of health research are firmly in place. While training and cooperation agreements with academic institutions and universities are of utmost important to foster the implementation of clinical research on the short run.

## Results and Discussion: Workplace Challenges (West Bank vs. Gaza)

This chapter discusses and analyzes the fragmentation of the Palestinian healthcare system and diabetes care due to different geographic barriers to the Palestinian healthcare system in Gaza and the West Bank. The division of the Palestinian territory and population creates related specific barriers to health access. The imposed blockade of the Gaza Strip by land, sea and air has drastically limited the movement of Palestinians in and out. The health system suffers from shortages of essential medicines and supplies. The political division due to internal Palestinian conflict and the de-development of healthcare system in Gaza, further intensifies the difficulties [17]. The physical and administrative division of the West Bank further amalgamates its geographical separation from the Gaza Strip. The West Bank has been administratively split into Areas A, B and C under the Oslo Accords in the early-mid 1990s; while areas H1 and H2 in Hebron have been created as a result of the protocol concerning the redeployment in Hebron in 1997 [18]. Area C and H2 are under direct Israeli civil and military control, with Area A and H1 under Palestinian civil and security control; and Area B under Palestinian civil and Israeli military control. The territorial division and physical separation of Palestinian communities in the West Bank (WB) and Gaza pose major barriers to free movement and significant implications for the provision of services and impact on the lack of sustainability of the Palestinian healthcare system [19].

This chapter elaborates and further discusses the challenges that face the Palestinian healthcare system within the context of these territorial divisions by using the WHO health systems buildings blocks: (1) Service Delivery section. In this section, I argue that big gaps have been detected between the provision of comprehensive diabetes services in West Bank and Gaza due to the siege, political division and fragmentation of land. Such a situation created more problems and bureaucracy in the referral and permit systems. (2) In the Health Workforce section, I argue that conflict and political division between West Bank and Gaza has severe negative implications on access, and job satisfaction of healthcare workforce. (3) In the Medical Products and Technology section, I argue that the chronic conflict, siege and division between Palestinians led to severe depletion in the essential drugs, shortage of medical supplies, equipment and maintenance of medical equipment.

### Service Delivery

In Low Middle Income Countries (LMIC), many patients do not have access to well-established treatment measures. Consequently, they are poorly controlled due to constraints in accessing continuous care [24]. The WHO reported that a political conflict can threaten health care services through its effects on infrastructure, human resources, equipment and supplies; and the access to care [79]. In Palestine, described as an area with chronic conflict, many of the challenges faced by the healthcare system were unique to a conflict zone area; while others were common to the LMICs [80]. The territorial fragmentation and divisions between Gaza, West Bank, and Jerusalem; and the further divisions within the West Bank area (Areas A, B, C, H1 and H2) are significant barriers which should be explained in order to understand the context and conditions in which the Palestinian healthcare system operates.

In this section, I will describe and further explore the following sub-themes:

1. Access to Comprehensive Diabetes Services,

a) Health Referrals System,

b) The Permit System,

2. Health Workforce,

a) Implications of Conflict and Political Division on Health Workforce;

b) Implications of Conflict on the Access of the Health Workforce;

c) Implications of Conflict on the Job Satisfaction of the Health Workforce, and

3. Medical Products and Technology.

#### Access to Comprehensive Diabetes Services

Health service accessibility reflects the degree to which individuals are inhibited or facilitated in their ability to gain entry to and to receive care and services from the health-care system [24]. Physical accessibility, whether a patient can easily reach healthcare providers clinic or hospital to receive healthcare, is severely hindered in both Gaza and the West Bank due to territorial separation and fragmentation. Checkpoints and road blocks, the separation wall; and military presence in the West Bank have restricted movement and limited access of patients to health care facilities [24]. Israel and Egypt imposed strict comprehensive siege upon Gaza. The siege impinges on effective healthcare provision through two central, intertwined processes: 1. withholding materials and resources and 2. undermining healthcare at a system’s level [81]. Each of these practices reflect on the strains on health care in Gaza and disrupts their functions. Adding to that, the serious damage to electricity, water and healthcare infrastructures inside Gaza due to the repeated Israeli bombing and rounds of fighting between Israel and Hamas; and the inability to renovate the damaged facilities and infrastructure, have further deteriorated the situation [82]. Published research has confirmed that health services in the community in Gaza Strip are not enough and diabetes health management program in the community health clinics does not provide enough help and support to the patients [33].

All the professionals that I had interviewed mentioned about different aspects of the effects of occupation, conflict and territorial separation on healthcare provision and access to health services. Some professionals described access restrictions of movement as the biggest constraint to healthcare delivery. In Gaza, professionals struggle to provide the very basic and lifesaving services and have stressed on the fact that there were no options to initiate the provision of comprehensive and quality services due to the bad and disastrous situation of the healthcare system there. A senior physician from the West Bank stated: ***“The access to healthcare in the West Bank is very much dependent on the general political and security situation. The unpredictable daily and momentary accessibility today within Hebron, as an example, is very complicated. All the inhabitants who live in Hebron (H1 & H2 areas) can access our clinics; but after one hour or the next day, the whole situation may change, and nobody can access our clinics. Just to remind you that there are 620 checkpoints in the West Bank. During closures and curfews, we could not provide the straightforward services, i.e., immunization. Movements of ambulances also became very restricted in West Bank area, in addition to that movement of ambulances from the West Bank to Jerusalem also posed a major problem; and the patients have to be transferred to the ambulance that has a yellow plate (Israeli) at the checkpoint to be transferred to a hospital in Jerusalem or anywhere outside the Palestinian Territories. Imagine, if the patient is in a life-threatening critical condition and could not wait …?”***. Another MOH physician from Gaza described the conditions in Gaza as: ***"The conditions are disastrous; what the Gaza Strip is going through is unprecedented; when you feel like you're being imprisoned – it's not just a feeling, it's the reality. The blockade has caused complete isolation of Gazans from the whole world. The four wars through which Gaza had through during the last 12 years had destroyed many buildings and the infrastructure of the weak and fragile systems. Adding to that, the internal conflicts between Gaza and the West Bank – all of these things had impacted our ability to provide even simple healthcare services to our patients. We are struggling to provide the very essential lifesaving and preventive services to our patients. The provision of comprehensive and high-quality services is not possible in such conditions"***

The quantitative survey of my research has confirmed the big gap in the access to comprehensive care services between the West Bank and Gaza. 39.1% from the West Bank and 9.2% from Gaza professionals agreed they provide comprehensive diabetes care in their clinics. The difference is statistically significant(X2 = 12.672, df=1, p <.001). 10.6% professionals from Gazacompared to 34.2% from West Bank have agreed they provide diabetic foot services in their local clinics (X2 = 3.510, df=1, p =.061). The provision of HbA1c is much better in the WB compared to Gaza 53.1% and 11.9% respectively (X2 = 36.082, df=1, p <.001). Adding to that 48.3% from the WB and 11.7% from Gaza agreed they dispense necessary diabetes medications from their clinics to diabetes patients (X2 = 24.804, df=1, p <.001)**.** About 50% of professionals in the WB agreed they implement diabetes care protocols in their clinics compared to only 9.2% from Gaza (X2 = 34.285, df=1, p <.001). And finally, 41.2% from the WB and 7.6% from Gaza agreed they find enough time to discuss all issues regarding diabetes care (X2 = 26.491, df=1, p <.001).

The results of this research illustrate the large gap in healthcare access to the comprehensive diabetes services in comparison between Gaza and the WB. This is because of the consequences of Israel’s 13-year strictly-controlled blockade of the Gaza Strip. The nature of those imposed barriers deprive the besieged Gaza inhabitants from attaining a basic human right and that is, to receive the highest rightful standard of physical and mental health care; an outstanding big difference when compared even with the West Bank [18]. In Gaza and the WB, the context of imposed isolation and man-made humanitarian crisis in which the healthcare system operates, where around 29% of Palestinians are forced to live below the poverty line with a substantial gap between the West Bank and Gaza i.e. 53% of the population below the poverty line in Gaza, compared to 14% in the West Bank, [83]; this has further widened the gaps between the WB and Gaza. The siege on the Gaza Strip has led to a huge regression in the economic activity and an unprecedented distortion of the Gazan social structure and culture; and a decline in health services, education and in other humanitarian sectors [84]. It significantly hampers healthcare access and provision due to the constant uncertainty of availability of essential funds, supplies, and services [81]. Political conflict, territorial fragmentation and the related chronic stress are evident in both emergency as well as primary healthcare. This situation has highly impacted and negatively implicated the quality of life of people in Gaza. Abu Rmeileh *et al* research detected significant associations between poor health related quality of life and ongoing siege-related associated factors, especially reported distress, human insecurity and suffering [85]. The main reported cause of suffering of Gazans is the imposed siege, followed by the effects of the Israeli air-raids on the Strip and the internal Palestinian factional violence [85]. Due to the ongoing humanitarian crises in Gaza now being defined as uninhabitable [86], experts have described the present situation in Gaza like a time bomb that could explode at any minute [84].

In the West Bank, the nature of barriers to health access differs from those in Gaza Strip. Three million Palestinians in the WB continue to navigate a territory that is divided administratively into Areas A, B, C, H1, H2 and East Jerusalem. They are confronted by an extensive system of checkpoints with restrictions on movement preventing them from free access to essential health services [18]. In particular, the MOH faces extensive barriers to healthcare provision to the approximately 300,000 Palestinians living in Area C. 35% of the Area C population are dependent on mobile health clinics for access to essential primary health care services. In addition, when the building of the separation wall is completed, 9.4% of West Bank will fall in the Israeli side of the wall [18] isolating many villages and communities and creating a severe decline in the ability of people to access health services [37]. Meanwhile, an expanding settlement infrastructure and the extensive system of fixed and ‘flying’ military checkpoints hamper free movement and create unpredictable delays, including for ambulances [18]. Patients from the West Bank needing care in East Jerusalem may need to take a Palestinian ambulance to one checkpoint and then be transferred to an Israeli ambulance to continue the journey. This is known as a “back-to-back” transfer, and 90% of ambulances entering East Jerusalem in 2017 were required to comply with this procedure [22].

The protracted conflict, alongside sudden shocks, is overwhelming an already overburdened healthcare system in the WB and Gaza. The health system is struggling to cope with the ongoing conflict-related challenges. The lack for essential health services in the public system has significant implications for the capacity of the public healthcare system to provide adequate services to the population contributing to reliance on referrals outside the Ministry of Health. In the following sub-sections, I will discuss the challenges of referral and permit systems and their implications on the access of health.

#### Health Referrals System

The health referral system was in place before the establishment of Palestinian MOH in 1994. It was inherited from the Israeli Civil Administration (ministry of Defense) that administered the governmental health care system in a manner that kept it stunted and underdeveloped, with severe budget restrictions, referral to Israeli hospitals for tertiary care, and restrictions on licenses for new medical and health care projects; thus, creating a total dependence on the Israeli health system [16]. After 1994, the Palestinian MOH has continued to refer Palestinian patients to a non-MOH facility for specialist healthcare not available in the public system. The number of referrals is constantly increasing in both the West Bank and Gaza. The increase in referrals since 2017 was proportionately greater for the Gaza Strip compared to the West Bank. In 2018, hospitals in the West Bank, including East Jerusalem, accounted for 73% of referrals and Israel 20%. The remaining go to Egypt, Jordan, and Turkey [18]. According to WHO report 2019, Israeli hospitals saw 13 percent of referral cases but represented 33 percent of the total referral expenditures. While Israeli hospitals do see more complex cases, these do not account for the observed price differential; a study by USAID revealed that over half of the referral bills from Israeli hospitals are unauthorized by the Palestinian MOH. Israeli hospital fees are deducted directly from Palestinian tax revenue often without Palestinian authorization [21] [73]. In 2019, the total cost of all referrals amounted to 924,084,880 NIS (32.4% of the total health budget after the salaries which accounted for 43%) [31]. In March 2019, the Palestinian MOH has taken a decision towards ending referrals to Israeli hospitals [83]. The decision was made in response to the deduction of sums (Israel fund transfers) from the taxes that Israel collects each month for the Palestinian coffers. By September 2019, referrals to Israeli hospitals from Gaza had reached 24% of their 2018 monthly average, while referrals from the West Bank reached 29% of their 2018 monthly average.

Referral outside is still one of the most challenging and costly departments within the MOH. Results of opinion poll, conducted by AMAN [87], and testimonies by officials of the referral department, revealed that bribery is used in the Gaza Strip for obtaining medical referrals for treatment outside the MOH institutions. This was due to the lack of control over hospitals, lack of coordination between the various ministries, and/or lack of referring violators to prosecution to take the necessary measures against them; hence, there is an absence of clear and deterrent punitive measures for those receiving bribes. Referral abroad department was considered a highly politicized body. It is one that Hamas accuses of consistently refusing referrals of patients sympathetic to Hamas [88].

In 2015, the MOH started to implement special reform work plan to improve the system of referrals and purchase of services in the MOH by exercising closer oversight of medical referrals abroad, controlling and auditing bills from Israeli hospitals, reducing referrals abroad and relying on national hospitals; and conducting a comprehensive review of referrals and a tendering process for services from Israeli and Jordanian hospitals [13]. Due to poor governance, mismanagement of the Palestinian Authority, dependence on international aid for resources [36], these and other factors have distorted and fragmented the health system and adversely affected the implementation of referral system reform plans.

#### *The Permit System*

To complete the process of patient referrals described earlier, the vast majority of patients from the West Bank area and all patients from Gaza require Israeli-issued permits to access health facilities in East Jerusalem or Israeli hospitals. The permit is issued by the Israeli Coordinator of Government Activities in the Territories. Patients must navigate a complex and lengthy bureaucratic system [18]. They should provide necessary documents (referral approvals, appointment, financial coverage, copy of ID, security magnetic card) attached to the application form that should be submitted to Israeli Civil Administration by the Palestinian District Coordination Office in the area where the patient lives. In general, the permit needs up to two weeks in the WB and up to one month in Gaza to be issued if the patient is not a “security threat”.

The approval rate for patient permits needed to pass through Erez crossing from Gaza, dropped from over 90% in 2012 to 54% in 2017. In 2018, the approval rate for patient permit applications was 61% for the Gaza Strip, increasing to 67% in the first seven months of 2019 [83]. In the West Bank, the approval rate for patient permits to access hospitals in East Jerusalem or to access hospitals in Israel has remained similar over the last eight years. In the first seven months of 2019, the combined approval rate for patient and patient companion permit applications was 80% [83]. The permit could be refused at any point of the process with no explanation; and even if approved, the patient’s family members, in some cases the parents of sick children, may not receive a permit to accompany their children [18]. While Israel controls the Erez crossing on Gaza’s northern border, Egypt controls the Rafah crossing in the south. Egypt has also significantly limited who and what is allowed through since the blockade began. While humanitarian cases can apply for permits to cross, in practice, there have been many years when the crossing has been closed almost every day, even to medical cases. In 2017, for example, Rafah was only open for 36 days total [22].

In 2018-2019, the WHO carried out research on the impact of denial and delay of permit applications on patient survival. They matched ten years of data on patient permit applications, comprising 153,037 applications for 44,812 patients from 2008 to 2017, with data on mortality from Gaza’s death registry. To examine the impact of delay or denial on patient survival, the team looked specifically at cancer patients referred for chemotherapy and/or radiotherapy – where barriers to access would be expected to have an impact on survival. The study found that cancer patients applying for chemotherapy and/or radiotherapy who were initially delayed or denied permits to exit Gaza from 2015 to 2017 were 1.5 times less likely to survive in subsequent years [18]. On the other hand, Physicians for Human Rights Israel (PHRI), tried to help in overturning permit decisions for cancer women [89]. Physicians for Human Rights Israel (PHRI) discovered that women are affected by medical permit denials in three ways: First, female patients with cancer face severe restrictions to reach necessary treatment, equipment, and various surgeries unavailable locally in the Strip. Second, some exit permit criteria affect women twice as often as men. Their permits denied on the claim that they had “family proximity to Hamas”. Freedom of information requests revealed not only that a dramatic increase occurred in the use of this criterion in 2018, but that it was used twice as often on women. PHRI, together with other organizations, successfully appealed to the High Court of Justice to overturn the use of this criterion on behalf of the female patients. Third, women have been affected by the Israeli army’s refusal to give medical exit permits until relatives allegedly living illegally in the West Bank or Israel return to Gaza [89].

All the professionals that I had interviewed have further explained the challenges they have experienced due to permit issues. A nutritionist from a specialized referral center in Jerusalem has mentioned the stress patients face, the financial burden, the time issues to get the permit; and to travel for the appointment. She said ***"… Access has played a very big role in elevating patient stress and uncontrolled diabetes. When patients arrive to our center after many hours of waiting at the checkpoint, going through the rolling doors and electrical gates, while some of them will be sent for further security checkup and interrogation; their blood sugar turned to be very high. They have to pay a lot of money for transportation as they have to walk through the checkpoint and find additional transportation for the other side of the checkpoint. They have to take into account that they will lose the whole day for arriving to the appointment. Many patients refused to come more than one time in the month due to these problems. Many patients we have lost for follow-up due to security problems and denied permit".***

A physician from Gaza shared his experience by stating***:" I referred the patient to Israel for a big abdominal tumor excision. She received the approval and financial coverage from the MOH in Ramallah after two weeks. When she applied for permit to exit from Gaza, she was refused for an unknown reason. After three months of delay and with the help from humanitarian organizations, she finally got her permit. None of her family members were allowed to accompany her. She could not travel alone. Then the family asked to change the referral to Egypt. So, we have to go through the same cycle: we need the approval from the MOH in Ramallah and find a way to get her permit to leave Rafah checkpoint which was closed for long time. After two months waiting, she finally managed to leave to Egypt. I could not imagine her deteriorating medical situation after more than six months of waiting to do the operation?!".***

Closing borders and restricting exit from Gaza were believed to contribute to bribery and corruption habits. ***"It is well known that bribes facilitate referrals for medical permits, especially in the Gaza Strip"*** [22]. In addition, the results of the public opinion poll on areas most susceptible to corruption, conducted by the organization AMAN in the Gaza Strip, revealed that 22.5% of those surveyed felt it was the process of obtaining medical treatment referrals abroad being third from top, preceded by the services of the Public Authority for Civil Affairs in second place; and travel across the Rafah border takes first place in corruption [87].

With the hope for a realistic and just peace process as slight as it has been in decades, Palestinians cannot wait for a political agreement before they are afforded access to safe, high quality, and reliable health care. It is needed that the UN and other humanitarian agencies insist on demanding full and unadulterated access to all patients. They should undertake campaigns to pressure Israel to revamp its opaque medical permit system. This type of effort should continue in line with the WHO position that Israel is obligated to ***“enable un-delayed access 24/7, for all Palestinian patients requiring specialized health care.”*** Egypt should also allow more humanitarian crossings at the Rafah border in Gaza.

### Health Workforce

The growing population of Palestine increases the demand for improved human resources of health availability, including medical specialization; and for the delivery of quality healthcare services that match the demographic needs and epidemiologic shifts [68]. The Palestinian health workforce has seen an increase in recent years. The availability of health inputs including physicians, nurses, midwives, pharmacists, and dentists, can provide insight on the availability of services and the ability of the system to respond to the needs of the people. However, regional disparities in health personnel are increasing between the West Bank and Gaza [39]. Moreover, the composition of health workforce is characterized by imbalances in skill mix, with administrative staff accounting for the majority of employees and acute shortages of doctors with sub-specialties due to significant emigration and brain drain, particularly to Gulf Countries. In 2009, it was reported that the density of physicians per 10,000 population in Gaza and West Bank were similar (17.5 and 17.4 per 10,000 respectively), while in 2012 physicians in Gaza declined to 15.9, and increasing to 22.9 per 10,000 population in West Bank [21]. Obaid *et al* has reported severe shortage of diabetes specialist physicians in Gaza which leads people to seek an expensive consultation with private doctors that make the life of patients more difficult in terms of managing their diabetes [33].

My survey has confirmed the shortage of different specialties in the provision of diabetes care in addition to the high inequalities between the West Bank and Gaza. 37.9% of professionals from the WB have agreed they have specialized physicians available at their clinics to provide diabetes services; only 11.1% of professionals from Gaza did the same (X2 = 5.555, df=1, p=.018); the same thing has been applied for the availability of specialized diabetes nurses in the local community centers; 37.4% in the WB and 10.8% in Gaza respectively (X2 = 5.214, df=1, p= .022). While the gap is much greater when it comes to availability of nutritionists; 33.2% in the WB and 5.4% in Gaza (X2 = 20.270, df=1, p <.001). The Palestinian healthcare system does not deal with nutritionists as important team members in the primary care settings. A senior health manager in the WB said: ***"… there is lack of employment, shortage of personnel and also there is a high rate of retirement. In addition to the job rotation process in the ministry which is followed by staff turnover and changes of policies, without any prior study…. If you ask me about nutritionists, yes, we have a new nutrition department in the MOH, but we do not have enough number of nutritionists to work in the primary health care clinics. The system gives priorities to hire physicians and nurses and does not see nutritionists as part of daily activities of care in the primary health care clinics).*** When we asked professionals about the availability of diabetic foot specialists, a small percentage in both the WB and in Gaza agreed about the availability of this service;18.4% in the WB and 3.4% in Gaza (X2 = 7.298, df=1, p=.007). One diabetic foot clinic is located in a hospital in Gaza [33] but still needs more public awareness, education, training as well as providing simple tools for screening and management; and to be expanded and implemented in community centers. The results confirmed by an earlier study in Gaza showed that the diabetic foot service is hospital-based only rather than in community clinics. In addition, the study revealed that the evaluation of Diabetic Foot Management should emphasize on a more active role of health care providers in health education in order to increase the level of knowledge and awareness of patients about diabetic foot care; and to minimize the unwanted complications that could affect the quality of life for the diabetic patients. The system needs to employ adequate qualified and trained physicians and nurses to offer quality care to diabetic patients [90].

In order to understand the situation and the potential reasons behind the big gaps and inequalities in the health workforce between the West Bank and Gaza, I will discuss the following sub-themes:

\* The political context implications on health workforce,

\* Access issues and

\* Job satisfaction.

#### Implications of Conflict and Political Division on Health Workforce

Imposed siege and fragmentation; and the self-inflicted internal conflict between the West Bank and Gaza Strip have negatively impacted the health workforce in Palestine [22]. The chronic state of the conflict and its associated consequences further exacerbate the psychological state of providers. Working to provide care in highly contentious political environments means that providers had to cope with changing political environments and everyday violence and disruption just as with their patients’ struggle. These experiences have immensely affected health workers even beyond their natural roles, thus complicating and delaying their work as well.

In June 2007, Hamas had taken over the Gaza Strip resulting in the creation of two governments, one in Ramallah and the other in Gaza with parallel Ministries of Health [88]. Egypt and Israel responded by sealing Gaza’s borders, which deepened the isolation of the Strip; and further strained social services and health care. The Palestinian internal divisions have further politicized health care and reduced the quality and quantity of health care services available in Gaza. Both governments in Gaza and Ramallah launched campaigns to lay off public-sector employees affiliated with rival movements and promoted their own loyalists [88]. Due to persisting disagreements between both authorities in the Gaza Strip and the West Bank, little progress has been made to reintegrate health professionals in the Gaza Strip, with regular payment of staff salaries for a substantial number of health workers in Gaza Strip still unresolved. About 2163 health workers who stood down from their jobs in 2007 at the request of the Palestinian Authority (PA) and who are not presently working in the health services, continue to receive their full pay from the PA. About 4508 workers hired by the then Hamas from 2007 to 2013; and 530 workers employed by the Palestinian Authority who remained working after 2007, have received irregular and partial payments since mid- 2014 from the PA [91]. Other related figures from Hamas authority are not available to the public.

The Palestinian Authority and the Hamas administration have signed reconciliation agreements several times since 2007. According to the Physicians for Human Rights Israel (PHRI) report, the latest agreement between Ramallah and Gaza on October 12, 2017, and as a result of the national unity government, it was announced that 512 health workers were reemployed – about a quarter of the dismissed employees who were supposed to return to work gradually. This addition may seem significant, but a senior local health official revealed that most of the reemployed workers are pharmacists, technicians and administrators; whereas most of the doctors, including department and hospital directors have not been reinstated. Moreover, the fate of employees hired by the Hamas administration after 2007 was also not clear [92].

These difficulties lead to medical brain drain as Palestinian physicians emigrate for better training or career opportunities. World Bank reported contraction in the health workforce by 3% in Gaza between 2007 and 2008 (the most significant decline in recent years), following the call of President Mahmoud Abbas for government employees to stop reporting to work following the split between Fatah and Hamas [21]. Young doctors in Gaza may work 70-hour weeks to earn a mere USA $280 a month. Furthermore, clinicians and maintenance workers may be unable to leave for training in new medical technologies or for other professional opportunities. Established doctors receive less than half their salaries due to Palestinian authority sanctions [22]. In 2018, locals in Gaza estimated that between 100 and 160 doctors and medical professors had left; of those, many will not return. In Palestine, a 2008 survey of higher education and health professionals found that around 30% wished to emigrate, primarily due to the political and security situation [22]. These results also add to concerns about health care workforce experiences and strategies of adaptation within situations of extreme stress [79]. The ongoing impacts of siege and conflict, necessitate the implementation of creative and responsive strategies such as: reconciliation between Gaza and West Bank and the removal of the restrictions to allow medical teams to leave for professional training; ensure the financial, security and political conditions required for implementing a comprehensive economic plan; and providing large-scale investments for the rehabilitation of Gaza. Adoption of team and community-based models of care may be particularly important to this end.

#### Implications of Conflict on the Access of the Health Workforce

The Palestinian health workforce faces a range of obstacles on movement and access to reach their clinics, hospitals, and training facilities. impediments to access include restrictions on obtaining permits demanded by Israeli authorities to move between Gaza and the West Bank, including East Jerusalem, as well as movement within the West Bank [83]. The restricted mobility of health care staff disrupts their ability to provide their humanitarian work and function effectively. Besides preventing immediate service delivery, delays at checkpoints affect the administrative duties of health care planners, and managers, as site visits or meetings are wasted to all-day commitments due to road closures and checkpoint delays [79]. Restrictions on movement have negative impacts on the operations of health programs in terms of coordination, monitoring, supervising, planning, emergency response, fundraising, and training; thereby affecting the ability to provide consistent quality services throughout Gaza, the West Bank and East Jerusalem [83]. The majority of health professionals interviewed in my research have been affected by the checkpoints, barriers, curfews and the closure of Gaza in indifferent ways. A physician from the West Bank stated: ***"As physicians we suffer from the measures imposed by Israeli occupation as our people and our patients do. Leaving home early in the morning to go to my clinic, I do not know what will happen and if I will be able to reach the clinic or at what time I will manage to arrive to work. The daily suffering from crossing checkpoints on a daily basis put me under big psychological stress. You might be stopped for several hours even if you show all permits and document; you might be asked to return and look for another road to exit the city. You might also smell the tear gas or hear the sound bombs before you arrive to your clinic. It is a very hard situation. My wife, who was working as physician in Jerusalem, has left her job due to the daily suffering in crossing different barriers and security checks. She tended to leave at 5:00 am in the morning and come back around 7 pm. We could not continue like that, so, she decided to stay home and I continue to work".***

Anotherphysician from Gaza also stated: ***" I applied for a permit to leave Gaza to participate in the national diabetes conference in Ramallah and did not receive answer. The following year, I applied for another permit through the WHO and was refused. Then I tried to exit through Rafah crossing to attend conference in Spain, it was not successful as the crossing was closed. This is an example when you live in a big prison like Gaza".***

The majority of the Palestinian staff working in hospitals in East Jerusalem holds West Bank identity cards, meaning that they require permits from the Israeli authorities to enter Jerusalem. Out of 1,768 permit applications by East Jerusalem hospitals for their staff to access work places in 2018, 96.8% were approved for six-month permits, 1.6% for three-month permits, and 1.5% were denied [18]. Humanitarian workers are exempt from the general travel ban on Palestinians to exit the Gaza Strip through Erez crossing, which allows them to apply for permits to exit for professional reasons. The health staff from Gaza applying to exit to travel for continuous professional development or international conferences have faced substantial barriers to exiting, with only 15% of those applying through the WHO approved over the year. The approval rate for permit applications for entry of humanitarian health staff was higher in comparison, with non-humanitarian staff. The approval rate was greater for the WHO staff holding East Jerusalem or West Bank identity cards compared to international medical delegates [18][83].

Healthcare providers describe their commitment as a form of resistance to the ongoing occupation [79]. This resistance began at individual levels on the part of health care providers and became a collective manner of resistance through the establishment of health committees that were part of a larger scale of various social movements. Submitting to the collective pressure, the Israeli coordination office indicated a willingness to consider facilitating the entry and movement of health staff. Consequently, many health workers realized the value of monitoring and documenting the various violations on healthcare. Collectively, the majority of stakeholders enforced a stronger advocacy – particularly with the help of international organizations and friendly international governments to the Palestinian people. They demanded the need of enforcing legal accountability according to international law in regard to the rights of civilians to health care in conflict zones. Health professionals have played a sensitive role in advocating for just and dignified resolutions to this unjust situation that should strengthen the protection of healthcare and prevent future ill-treatment against the civilians [79][18].

#### Implications of Conflict on the Job Satisfaction of the Health Workforce

Job satisfaction feedback was expressed by the vast majority of Palestinian professionals interviewed, particularly from Gaza. Participants have reported extended periods of overtime with unpaid salaries; frequent changes in administration with little to no background or experience in their respective work roles. They expressed how much this reflects on the quality of work that they do because they lack the motivation. This is compounded by the fact that they have families depending on them for support. It is too hard to live in such a challenging environment and feel satisfied or motivated. A physician from Gaza declared: ***"If we were to talk about the obstacles that I face as a healthcare service provider, I don’t feel satisfied. We do not have job security and many times the administrations would change and the appointed managers are not qualified. They have been appointed based on their political affiliation rather than on merit. We do not receive our salaries on time. When the government pays the salaries, they are usually 40 – 50% of the total individual salary. We have families to support and we have other commitments in life. At the end, we are individuals who live in these unusual conditions. We are highly affected by the hardship reality. So, the obstacles as I mentioned, on the personal level, mostly, that there is no job satisfaction. We go to work, not in the same energy as we used to have and this reflects on the quality of work and the services we provide".***

The results of the quantitative survey have also confirmed the low job satisfaction in both the West Bank and Gaza. The big gap between the West Bank and Gaza is not surprising to anybody familiar with the current socio-economic and political situation prevailed in the Gaza Strip due to the ongoing conflict and its related consequences. 34.9% of West Bank professionals and only 2.9% of professionals from Gaza (X2 = 51.074, df=1, p <.001) have agreed they were satisfied with work salary/financial incentives they received. While, 48% and 8.9% of professionals in the West Bank and Gaza respectively have agreed they were satisfied with their work duties/work schedule(X2 = 35.283, df=1, p <.001).

The MOH could not manage to secure the needed medical sub-specialties, taking into consideration the difficult political and economic situation which affected negatively the proper implementation of the developed plans. This resulted in creating more work load on providers. In addition to the above difficulties and constrains due to the brain drain of medical staff because of the difficult political and economic situation; and the lack of incentives due to the rigidity in the application of Civil Service Law as cited as a source of dissatisfaction of Palestinian professionals in the West Bank and Gaza; have all contributed to the prevailing notion of job dissatisfaction [93]. It was documented in the literature that increased salaries (or money incentives) alone are necessary but not sufficient to deal with issues of satisfaction [39]. Improving intrinsic motivators and working conditions will be important to ensure success of the system reform, while recognizing that the political and financial circumstances will make it rather challenging. In order to boost motivation and job satisfaction, the brain drain workforce should be stopped; and to enhance effectiveness and future development [94], it is important that reforms be accompanied by: (1) an initiative to improve nonfinancial incentives and human resource management tools, morale boosting such as appreciation, supportive supervision, performance appraisal, career development, feedback from the community, and training opportunities; (2) initiatives to improve workplace conditions, including availability of equipment and medications; and (3) performance-based payment modalities (or pilots), such as performance-based financing, as an incremental step toward eventual provider payment reform moving away from central, historical budgeting [39].

### Medical Products and Technology

A chronic shortage of pharmaceuticals, supplies, spare parts and gaps in general maintenance led to further challenges for sustaining the quality of services in Gaza Strip and to a lesser extent in the West Bank [91]. Depletion of essential medicines, medical supplies and disposables have significant implications for the capacity of the public healthcare system to provide adequate services to the population [18]. Palestinian health workers reported that they work in health facilities that continuously face shortage of medications, equipment and supplies. The frequent cut in electricity in the Gaza Strip has created a very challenging situation for diabetes patients and providers. They have described a situation where you have to struggle to preserve the minimal resources when you are able to get them because of issues related to electricity cut, severe depletion in fuel to operate generators; and even how to preserve the cooked food for the diabetes patients who need to eat five – six meals a day. A nutritionist from Gaza added: ***"We have electricity supply only 4-5 hours a day. This affects how much medicine can be stored, as you know, insulin needs to be stored in a certain temperature, and the loss of power leads to faster damaging or shorter life span of the insulin. As providers, we have come across many cases when patients coming to the health clinic ask us to store their insulin in the clinic fridges. Operating in such situation, we need to think of innovative ways to help our patients and not just provide them with the medical service. As a nutritionist, I have to deal with situations when patients report to me that they do not have food or medication".***

Shortage of resources in both the West Bank and Gaza was evident in the results of my quantitative survey. The survey has clearly highlighted the big gaps between the West Bank and Gaza. For example, at the time when 51.6% of professionals in the WB agreed they have the necessary medical supplies available in their clinics to provide comprehensive diabetes care, only 8.3% of professionals from Gaza had agreed so; (X2 = 47.317, df=1, p <.001). 36.5% of professionals in the WB and 4.9% of professionals in Gaza agreed they have all necessary equipment to provide comprehensive diabetes care; (X2 = 33.939, df=1, p <.001). When providers were asked if they provided patients with glucometers and testing strips to check their blood sugar at home, 15.1% in WB and 3.4% in Gaza respectively agreed they do provide them to diabetes patients (X2 = 4.699, df=1, p=.030). More than that, 51.3% of professionals in the WB and 30.5% professionals in Gaza (X2 = 23.304, df=1, p <.001) have experienced shortage of medications and supplies in their clinics at least once during the last year.

For several years now, the Gaza health system has been suffering from a severe shortage of drugs and medical equipment [92]. In 2014, nearly 50% of Gaza’s medical equipment was outdated. The average wait time for spare parts was six months, and 25.7% of medicines on the essential drug list were near or at zero stock at the MOH facilities [39]. In 2018, 61% of medicines were depleted and 65% depleted in the first six months of 2019 [19]. The most direct impacts from the siege have resulted in the inability to import necessary medical items such as medicines, disposable items, and spare parts for machinery; along with a ban from the Israeli government on items needed to support industry and economic development [81]. Entry of humanitarian and medical supplies is restricted by Israel’s "dual use" list of equipment, machines and supplies. "Dual use" items include medical equipment and supplies such as nuclear scanning technology; and materials used in treatments or prostheses. The list includes as well important items and spare parts needed for the maintenance of medical equipment. The list items change frequently and remains subject to very broad interpretations and ad-hoc changes according to the security and political context [18]. These restrictions are compounded by customs limitations, with delays in delivery, incomplete deliveries, under-developed systems to rationalize allocation and maintenance, and overall inadequate equipment. There are problems with the upkeep of equipment related to the inability of staff to access adequate training, the unpredictable electricity supply that adversely affects highly sensitive electronic circuits; and structures contained in many types of medical equipment; and the limitations on delivery and return of equipment or the spare parts when complex machinery is not operating properly [18].

The WHO specifically identifies the maintenance of medical products and technologies as essential to developing a functional health care system. Difficulties face the Palestinian healthcare system in maintaining equipment, providing access to modern medicine, constant power outages, and shortages of fuel for backup power generators and for vehicles being the direct results of the siege and the political division [81]. The siege works to maintain Gazan dependency on Israeli goods, prevent the development of local industry, limit humanitarian aid and sporadic assistances that amend the long-time crippled healthcare system [22]. The UN and other humanitarian agencies must demand full and unadulterated access for all humanitarian goods to the Palestinians. The Palestinian Authority should also put the lives of Palestinians above political maneuverings and ensure that citizens, especially in Gaza, are provided with the medicines and other goods they need to ensure optimal health.

## Results and discussion: Health Policies, Finance, Leadership and Governance of the Health System

While it is recognized that the situation in developing countries is a complex one, where rapid changes and political instability make it difficult to plan for the future, it is timely crucial to critically scrutinize the health sector financing, the formulated health policies and the health stewardship. This course of action in investigating the context in which changes in the health sector have taken place should contribute to a clearer vision of what is needed and what can be realizable in the future. Formulating national policies and strategies is a basic function of governments, and the task of formulating and implementing a health policy falls within the jurisdiction of the health ministry. An explicit health strategy defines the vision for the future, and outlines how the objectives will be achieved. The national health policies should outline priorities and the expected roles of different actors, inform and build consensus; and estimate the resources required to achieve the goals and priorities [25]. The governance underlies all health system functions. It includes the regulatory and managerial arrangements through which the health system operates, including how the overall goals are set and monitored; and how various components of the health system interact to achieve these goals. The governance also includes normative values (equity, transparency), and political systems within which health systems function.

The Palestinian healthcare system is experiencing an epidemiological transition, compounded by the health impact of the political, security, and economic situation. The burden of Non-Communicable Diseases (NCDs) is increasing due to cardiovascular diseases, diabetes, and cancers. This disease burden contributes to cost escalation in the health sector and will necessitate a greater focus on health prevention, primary care, and integrated disease management. The political, security, and economic situation impose severe challenges to the Palestinian health sector. These include challenges related to health outcomes, service delivery, access to health services, quality of care, human resources for health development and planning; fiscal sustainability, governance and accountability; investment planning and management, and creating a long-term vision and strategy for the development of the sector [21]. The recent conflict in Gaza has had severe negative consequences on the health of the population and severely exacerbated the fiscal problems in the health sector. The conflict has greatly worsened the situation, and the Palestinian Authority (PA) is limited in its ability to pay for health services, pharmaceuticals, and recurrent expenditures; and to meet immediate challenges in the health sector. As is the case of other developing countries, the swiftness of development planning in Palestine to suit donor agendas and budgetary deadlines ‘constitutes a major threat to appropriate policy development’ [16]. In this chapter, I will discuss and explain important themes regarding health policies and strategic planning; health financing and leadership and governance. I argue that there are huge challenges related to these themes that severely alter the healthcare system functions, effectiveness and efficiency of health services in addition to corruption.

### Health Policies and Strategic Planning

The effects of the unstable and ambiguous political environment, violent conflict and consequent economic instability on health system, and the formulation of health-related policies are profound. Operating in such an environment imposes considerable challenges to policy-making, planning and its implementation. Within such a context, efficient and ‘logical’ policy- making is not realistic [95]. The expectations of people in Palestine and the international community, are that the Palestinian Authority should act as a government of a state in terms of policies, planning and health legislation [94]. Unfortunately, this does not work due to the lack of sovereignty, control over borders and resources, and high dependency on the external aids. The absence of a long-term Palestinian development agenda focusing on sustainable and equitable growth has undermined any strategic planning. Nevertheless, effective approaches are available to prevent or delay the most common type of diabetes i.e. type 2 diabetes; its devastated complications and the premature death that can result from all types of diabetes[1]. However, multisectoral-population-based approaches are needed to reduce the prevalence of modifiable diabetes risk factors – such as overweight, obesity, physical inactivity and unhealthy diet – in the general population. Policy measures are needed to increase access to affordable, healthy foods and beverages; to promote physical activity; and to reduce exposure to tobacco policy action, to increase the price of foods high in fat, sugar and salt that can decrease their consumption [1]. Unfortunately, such policies and regulations are either not present or not implemented in the Palestinian healthcare system. The prevalence of obesity is increasing and is predicted to continue to increase. There is no national strategy in place to target obesity reduction [96]. The same case is also applicable on other modifiable risk factors of diabetes and other Non-Communicable Diseases (NCDs).

Interviewees in my research had stressed the necessity of health care; the availability and the implementation of health policies and regulations. In addition, they have pointed out the challenges regarding the dysfunction of the Legislative Council since 2007, and how this has affected the process to pass new legislations and the related bylaws. A senior health manager in the health policy and planning unit in the MOH has stated: "***We do not have legislations or laws specific to the prevention and control of non-communicable diseases (NCDs). The exception is the control of smoking and consumption of tobacco products law. It is the only law that could be applied, but it is not fully applied. The success of the implementation mechanism needs by-laws, implementing regulations, regulations adopted by the Anti-smoking law; in addition, the Ministry of Health cannot apply this law alone. The whole Government bodies must contribute to the implementation of the law***". Another senior physician from Gaza also declared: "***Most of our governmental institutions are not functioning, legislative and Executive institutions alike. When I mention legislative, I mean matters that have to do with diseases in general. The Ministry of Health itself is majorly out of order – they do not enact any required laws to promote the prevention and control of diabetes and other non-communicable diseases. If we look at the Legislative Council, we find it to be out of order itself. The council is supposed to enact laws for all ministries, and everything that affects the country and the people should be passed through the council***". One senior health manager in the MOH added: "***The general health law (public Health Law) is good, but should be developed/updated over time. We are not in a good situation. We do not have a legislative council that sets laws; and this is also one of the challenges in updating the systems and laws***".

The quantitative survey in my research has also confirmed the status of lacking of health policies and regulations that could help in the promotion of healthy lifestyle and the prevention of diabetes. Only 22.7% (n=78) of professionals participated in the survey have agreed that we have enough regulations to promote nutrition/healthy diet**.** While only 13.9% (n=47), has mentioned that the Palestinian healthcare system has plans to face the rising prevalence of obesity, as obesity is one of the main modifiable risk factors for diabetes and other NCDs [1]. Early in life, when eating and physical activity habits are formed and when the long-term regulation of energy balance may be programmed, there is a critical pathway for intervention to mitigate the risk of obesity and type 2 diabetes later in life [1].

When asked about legislations regarding other modifiable risk factors, smoking and exercise, results came disappointedly low as only 20.1% (n= 69) and 37.6% (n=126) of professionals agreed that the Palestinian healthcare system has enough legislations to promote smoking prevention, and that diabetes patients can use available public spaces to exercise, respectively. While 46% (n=146) of professionals believed that the Palestinian healthcare system implements services according to priorities/strategic planning.

The MOH has adopted several national policies aimed at promoting the health situation in the country, ensuring that health services are available for all citizens, improving performance; and enhancing the quality of the health sector, and promoting optimal utilization of available resources in view of the recent economic and political crises [13]. No single policy or intervention can achieve changes of this magnitude [1]. Diabetes is not only an issue to the health system; and therefore, the leadership of the MOH has to go beyond the health sector in order to create a positive policy environment. This can be achieved by adopting agendas that call for a “whole-of-government” approach, in which all sectors systematically consider the health impact of policies on trade, agriculture, finance, transport, education and urban planning; distinguishing that health is enhanced or obstructed as a result of policies in these and other areas [1]. This management of diabetes, outside of the health system, is distinctively important in low-resource countries, like Palestine, where the formal health system is underdeveloped and highly dependent on donor aid [8]. Donor aid to tangible results is more preferable than in intangible outcomes due to the fact that donors need to show how their donations are spent, such as in equipment and supplies rather than in better performance and skills development. This lack of interest by donors for non-communicable diseases impacts the policy response countries develop [14].This policy response needs to be shaped at the global, national, and local levels [8]. “Health in All Policies” was adopted globally to address the wide-ranging and interconnected aspects of healthcare and its determinants and challenges [49]. Regions experiencing conflicts and instability, such as Palestine and the Gaza Strip, in particular, are required to address health legislations and prioritize social determinants of health in light of rapid changes and deterioration in all aspects of daily life in order to reduce the disparities among people everywhere and in the Gaza Strip specifically; and bridge the gaps across sectors and geographical areas.

Palestine is committed to work towards achieving the Sustainable Development Goals (SDGs) during the coming years [13]. The government would incorporate these goals and targets into national frameworks and policies, and include them in the upcoming national strategies and plans towards achieving them by 2030, within the available resources and national priorities. The progress will be monitored by means of localizing the globally adopted indicators that monitor achievement of the SDGs and their targets in partnership with the Palestinian Central Bureau of Statistics (PCBS). The development of sound policies and plans does not guarantee their effective implementation [7]. Palestine still lacks a general development policy, and within the context of this "Policy vacuum" characterized by the absence of internal Palestinian debate on the type and direction of reform the country needs to take [16]. The World Bank and external donors are of growing influence on economic, health and social projects. Donors interfere with projects details and programs. They can choose what to do and what to support within each priority [14]. Health plans for Palestine were developed with input from many stakeholders. Non-ministry stakeholders were not effectively involved in the planning process, with the result that there has been no overall development policy around which national and provider-specific policies could be developed. Although many of the objectives in successive national strategic health plans have been clear and restricted, few have had target completion times, or adequate budget preparation and prioritization [94]. The new national strategy 2017-2022 has three main pillars: path to independence, governance, and sustainable development. Under them, there are priorities, policies and interventions. Most of the health interventions are under sustainable development. Thus, any project proposed by the donor within development in the health system is considered aligned with the national strategy [13]. In this regard, the MOH seeks to promote the legal and regulatory environment in the health sector. Making important achievements in the past two years, the Ministry will continue with these efforts during the coming years, and will focus on sustainability of the health system and enhancing its performance [13]. In this context, the Ministry addresses two main issues: amending the public health law and amending the government health insurance system. Enacted in 2004, the current public health law needs urgent amendments and development in order to be more comprehensive and specific and correspond to national health developments and innovations. There is also an urgent need to review, revise and upgrade the health insurance system in order to increase its potential to enhance financial sustainability and achieve equity and financial protection for all citizens; and consequently, achieve universal health coverage.

In conclusion, the Palestinian healthcare system is functioning in a complex context. The ambiguous political and economic environment, the unique geographical separation of the West Bank, Gaza and Jerusalem, and the socio-demographic and cultural characteristics of the Palestinian population, as well as the international pressure of the funding agencies, are critical elements [23]. The interaction of these factors as well as the fragile context of the Palestinian healthcare system makes the organization of health care and health policy development a very complicated process. As a consequence, appropriate health policy-making and priority setting in the Palestinian health care system is more than challenging. The current health strategy 2017-2022 has set specific strategic objectives and action plan that are congruent with the commitment towards achieving the Sustainable Development Goals (SDGs). The government would incorporate these goals and targets into national frameworks and policies and include them in the upcoming national strategies and plans towards achieving them by 2030 [13]. To delay or prevent diabetes and the other non-communicable diseases; modifiable risk factors should be targeted in education, awareness, management and most important with health policies and proper legislations. National policies and detailed strategies for the prevention and care of diabetes are highly needed. Further efforts are needed to ensure the availability of unconditional fund to implement such policies and strategies according to the prior set plans and priorities. A combination of fiscal policies, legislation, changes to the environment and raising awareness of health risks works best for promoting healthy diets and physical activity [1].

### Financing the Healthcare System

The case in low- income countries represented by a high proportion of money for healthcare comes from individuals in the form of out-of-pocket expenditure. The challenge in these countries is to provide financial protection to the population with a very low formal sector and tax base. Globally, there is a push for these countries to work towards Universal Health Coverage (UHC) [8]. The MOH is the responsible national institution for leading and regulating the functioning of the health sector and ensuring the necessary resources for its sustainability and development in response to the changing and increasing needs of the entire population. In this section, I will discuss the health budget and health insurance in addition to external or foreign aid to the Palestinian healthcare system.

#### Health Budget and Health Insurance

The responsibilities for the provision of healthcare to the Palestinian population in the West Bank and Gaza Strip were transferred to the Palestinian Authority upon its establishment following the Oslo Accords in 1993 [18]. In compliance with the UN resolutions on the implementation of Sustainable Development Goals (SDGs), the Palestinian MOH launched the 2017-22 strategy to strengthen the resilience of all Palestinians, while providing concerted support to citizens in Area C, the Gaza Strip and East Jerusalem [13]. The government’s reform and development strategy, outlined in this Agenda, aims to provide all Palestinians with an improved standard of living, better services accessible to all and responsive, accountable, transparent public institutions that put citizens’ interests and needs first [20]. This strategic approach necessitates that adequate budgets be earmarked to implement ambitious health, preventive and therapeutic development projects. These include, first and fore- most, the chronic non-communicable diseases prevention programs such as diabetes. Unfortunately, over the past eight years, the government has not reflected this strategic approach in its program budget structure [20]. In addition, patient referrals outside Palestine have been a major drain on the already low MOH budget. To fulfill the slogan of nationalizing health services, needed budget allocations should be provided to improve health institutional infrastructure, develop continuing medical education programs, and provide capacity building to health professionals or attract immigrating competent Palestinian health professionals. This requires more substantial budgets than those currently allocated. Adequate budget allocations need to be designated for the MOH. To this avail, at least 12-15 percent of the Gross Domestic Product (GDP) should be appropriated to strengthen the capacity of the Ministry to implement necessary health programs, which are essentially linked to sustainable development.

In my research, the Palestinian healthcare professionals showed that they were fully aware of the bad consequences of the financial situation that prevailed in Palestine; and directly impacted the services, programs and even to the existence of the Palestinian healthcare system. Adding to that, the unprecedented financial crisis that the UNRWA faces are jeopardizing the continuation of its essential primary healthcare services to the Palestinian refugees [49]. A senior manager in the MOH said: ***"Our biggest problem is that the budget is not really available in the ministry. If we want to apply any program for example, diabetes awareness program, it needs a defined budget which is not really available in the ministry. Then, we have to submit requests to the Ministry of Finance which gives us much less amount than required. Consequently, the program will not be implemented or will not be completed. The donor countries offer to give us the remaining amount, in exchange for, policy implementation (imposing political agendas). Thereby, we have many projects in the ministry that we didn’t benefit from; and some projects were imposed on the ministry of health that did not consider them priority for the ministry"****.* Another senior physician from Gaza added: ***"We heard in the news about the potential decrease in UNRWA's budget. We pray to God that this would not happen. This will be a true catastrophe that will directly affect more 75% of the besieged people in Gaza who directly benefit from the health services of the UNRWA. I do not know how the world would accept to allow the punishment of diabetes and hypertensive patients by depriving them from medicines".*** Moreover, the quantitative survey has also confirmed the pessimistic scenarios that face the healthcare system in Palestine. 86.1% (n= 298) of professionals think that the sustainability of the Palestinian healthcare system is threatened due to financial crisis. 80.9% (n= 262) of professionals agreed that the development of healthcare system is not possible due to the current financial crisis. While only 40% of professionals agreed that their organization/clinic prioritizes the primary care of diabetes in terms of budgets and allocation of resources.

Budgetary ceilings allocated to the MOH are in fact below the actual needs, with a funding gap in the operational and capital expenses starting from NIS 347 million in 2017 and reaching NIS 492 million in 2022 [13]. Looking at the structure of the health budget in 2018, we found that 46% is earmarked for salaries, 48% for operating expenses, and 0.6 percent for capital expenses [20]. In terms of health programs, Primary Health Care and Public Health Program account only for 13% of the total health budget [13]; and almost half of public funds (49%) were directed to hospitals [97]. Of the Palestinian Authorities $5 billion budget approved for 2018, only 9% was allocated for health compared to 30-35% that went to the security sector [22]. Despite that, the MOH usually does not receive the entirety of its approved budget [21]. The annual deficit in the budget reaches 15% of expenses above the year-end budget target [97]. The discrepancies between the approved and actual expenditures hamper recurrent expenditure planning and medium-term investment prospects. Furthermore, unpredictable revenues undermine the MOH’s credibility as a purchaser of services (from other service providers) and medical supplies (e.g., drugs and disposables) [21].

Public Health financing in Palestine relies on a combination of global and line-item budgeting based principally on historical costing. Typically, systems with this financing mechanism are incentivized to (1) increase inputs (beds, equipment, staff, etc.); (2) under provide services; and (3) spend all funds by the end of the budget cycle. International evidence and experience indicate that these systems offer little incentive to improve the efficiency of the input mix, quality or access [21]. There are three main sources of finance for the health system in Palestine: public; private; and the rest of the world funding [97]. The source for health expenditure was 29.7% from government domestic revenue transfers, 52.5% as other domestic revenues, and 4.4% as direct foreign transfers [98]. Only 10-12% of Palestinian public healthcare financing comes from insurance contributions [18]. The Palestinian Ministry of Finance provides the remaining; meaning that tax revenues and centralized financing of the Palestinian Authority are significant to ensure the sufficient availability, quality and sustainability of healthcare [21]. The low tax revenue is related to the amount of tax revenues collected in Gaza’s tax base which is significantly lower than that in the West Bank. This is a result of the internal division between Fatah and Hamas, which takes off almost 4% points of general government revenue [21]. All revenues collected by the MOH are transferred to the Ministry of Finance, including any user fees and insurance co-payments; this practice undermines the potential incentive for improving the quality of care and providing some financial flexibility at a facility level[94]. The centralized financial management of the MOH at the Ministry of Finance creates bureaucratic system that results in delays in implementation of programs [14]; and restricts the capacity of the directors of hospitals and health centers to exercise control over budgeting and staffing [94]. Israel controls tax revenue collection in Palestine which it is contractually obliged to transfer to the Palestinian Authority under the 1993 Oslo Accords [99]. However, it frequently withholds tax revenues for punitive and political pressure purposes making it difficult for the Palestinian Authority to pay for public sector salaries and services [18]. In 2018, the Israeli government enforced a 2018 law calling to freeze such revenue, claiming that this money was paid as stipends to the families of Palestinian prisoners held by Israel and those who had been killed by the Israel. Since that time, the Palestinian Authority could not pay the full salaries of the public sector employees and settle other financial commitments.

Approximately 78.3% of the Palestinian population (65.7% from West Bank and 95.4% from Gaza) is covered by some form of prepayment for health care [100]. Some 323,700 Palestinians with East Jerusalem ‘residency right’ have access to Israeli health insurance though the right of Palestinian ‘residents’ to remain in Jerusalem depends on them continuously demonstrating their ‘center of life’ in the city, through place of work, study or residence [18]. The major providers of health coverage, the Government Health Insurance and UNRWA, account for over 90% of the coverage provided, and overlap significantly [73]. The government health insurance covers primary services including maternal and child health services, secondary care, prescription medicines on the essential medicines list, and tertiary care services needed but not available in MOH facilities that are purchased from non-MOH facilities within and outside the Palestinian Authority. The health expenditure indicators in Palestine reveal that health expenditure has a high share of the Gross Domestic Product (GDP) [13]. The percentage of total health expenditure to GDP increased from 9.8% in 2014 to10.7% in 2015 [98]. Some 45.5% of health financing comes from out-of-pocket (OOP) payments. It is higher than many countries in the Middle East and North Africa region (MENA). The overall MENA average of OOP was 35.5% [39]. According to the World Bank, OOP and the resulting impoverishment, remain a key challenge and priority for healthcare reform [21]. The general impoverishment of the population makes it vulnerable to healthcare expenditures, and the scarcity of good quality government health services increases utilization of private, more expensive health providers. The poorest groups are at the greatest risk of impoverishment as they bear a higher share of OOP expenditures compared to their total share of income. High OOP spending poses a significant barrier to access to care, and indicates that Palestinians are not protected from financial shocks due to health events [39].

In conclusion, the lack of sovereignty and effective control over natural resources or other potential sources of revenue hamper the ability of the Palestinian Authority to adequately finance public healthcare and fulfill these duties towards the Palestinian population in the West Bank and Gaza [18]. The high proportion of household out- of-pocket expenditure, the high cost of curative services and the significant financial burden of referrals and the purchase of health services on the MOH budget; are all factors that impede Palestinians from obtaining proper health care, even the crucial. These findings highlight the need to rationalize health expenditure, increase its efficiency, focus on investment in the local sector, and invest in more sustainable sources of heath financing, as well as provide financial protection of citizens accessing health services by ensuring universal health coverage [94]. Efforts should be exerted to remedy malfunctioning schemes of healthcare financing. Concrete steps are needed towards the institutionalization of a genuine social insurance scheme with a view to universal coverage. The current health insurance scheme should become a sovereign and accountable legal entity, functioning under collective ministerial supervision, with control over its own revenues, which can be used to purchase services with appropriate methods of financing. Community-based health financing schemes and the current Palestinian Authority health insurance together could form a nucleus to enable efficient and equitable resource mobilization and to introduce the change gradually, taking into consideration prevailing political, economic, and social conditions. The appropriation of the MOH budget does not reflect in any way the ambitious goals, plans and aspirations expressed in the 2017-2022 health strategy [20]. On the contrary, it reinforces that the budget will be more dependent on external support and political blackmail.

#### External Aids

A major result of the signing of the Oslo Peace Accords and the establishment of the Palestinian Authority in 1994 has been to support the primary objectives to the peace building process; and to promote social and economic development of Palestinians through the PA. Consequently, several international aid and UN organizations, as well as local and international non-governmental organizations, have been pouring considerable financial and technical investments to the PA [16]. The Palestinian Territories is an example by distinction of the growing interest of the international donor community in supporting rehabilitation and peace building. Therefore, the Palestinian Territories have been considered one of the largest recipients of aid undertaken by the international aid community [23]. More than 42 donor countries and multilateral agencies provided economic reinforcement to develop the institutional capacity of the Palestinian Authority. At present, external aid constitutes almost 5% of total health spending in Palestine with estimates that on average 80% of the NGOs budget was funded by external donors [14].Due to the ongoing and long lasting conflict and crises in Palestine, humanitarian aid become a priority over the development aid [14]. According to the World Bank, one of the numerous challenges facing development in Palestine is the involvement of more than forty donors over two dozen multilateral organizations and UN agencies, and hundreds of local and international NGOs in the development effort[16]**.** It is a fact that donors have contributed to the competition between the MOH, NGOs and other recipients of donations [14]. Despite the important role of external funding in alleviating short-term effects of a socioeconomic crisis, the existing confusion in the system can have conflicting agendas and be poorly coordinated [94]. There has been little coordination among the donor community in the health sector, and donor funds are often politically tied and uncertain. Donor interventions and policy are often not aligned with national priorities, leading to inefficiencies in service delivery and constraints on health sector governance [21]**.** In some cases, donor preferences for funding rather than the actual needs determined in a perspective of sustainable development, have defined the very nature of the projects themselves [16]. Technical assistance is frequently linked to assistance from donor nationals, who often have limited time in the field and are not familiar with the culture or the language. The Palestinian Authority officials and Palestinian researchers report, respectively, that 70 and 90% of technical assistance funds are spent on donor personnel or in donor countries [16].

Both qualitative and quantitative results of my research have confirmed the existence of difficulties that face the Palestinian healthcare system in terms of acquiring funding and the various political strains around the external funding agencies; and the competition of who receives those funds, the MOH directly or the domestic private health service providers/NGO’s, such as UNRWA, Augusta Victoria Hospital etc. Moreover, the donors impose their own conditional priority requirements to suit their own agendas. This creates a system of competition between different recipients of fund to provide the same health services. Only, 37.9% (n=117) of professionals agreed that donors support healthcare projects as they are planned without imposing their agendas. In addition, and for political purposes, 45.4% (n=143) of professionals agreed that international donors will continue their support to the health sector in Palestine. A senior manager in the MOH elaborated: ***"Our health plan strategy 2017-2022 already exists and is published. We could not apply it because of the financial deficit. The only option that we have now is to ask the donors for more support which is conditional on implementing the donors’ agendas in order to dispense the required funds and even more. However, we cannot always agree and implement their requirements. In addition, many donor countries will ask to fund items based on their priorities and not our priorities. Sometimes, 60% of the fund will go back to donor countries due to their impractical imposed funding polices".*** AGaza senior physician also commented on this issue and explained: "The ***Gaza Strip depends heavily on the assistance of donor organizations. UNRWA, the biggest healthcare provider in Gaza, is in true danger to stop its vital services to Gazans due to the decision of the United States to stop funding the UNRWA. We all know that this is a political decision as the US is trying to erase the status of Palestinian refugees to end this major issue because the US and Israel consider the refugees as one of the big obstacles to achieve their own peace talks and plans with Israel".***

The Palestinian Authority has shown that it is more and more dependent on external aid support due to strains imposed on the daily life of Palestinians. Therefore, the official development assistance has constituted a significant amount of the individual and national incomes reliable on external aid [14]. This is due to the Israeli closure and dominance over resources that resulted in a high unemployment rate and rendered the Palestinian economy highly fragile and malformed; and thus, highly dependent on the external aid flow. Adding to that is the financial extra burden to repair the substantial material destruction and the humanitarian distress after the wars on Gaza [14]. In 2018, the Palestinian Authority approved the budget of USD 5 billion, in which only 9% was allocated for health and 30-35% went to the security sector. Of the total budget, $775 million (15.5%) was slated to come from foreign aid, generally divided into security support, funding for UNRWA, and money for USAID projects [22]. Even as the US has made drastic aid cuts, affecting millions of Palestinians’ ability to access medical care, education, and food, Israeli and the US officials are scrambling to preserve one piece of the aid package: security. What began as a “security first” arrangement is morphing into a “security only” strategy [22].

The international assistance is profoundly political, and its continuity largely depends on the peace progress [23]. Some donors chose the recipient entities according to their political orientation. Donors vet the people working in the health system before giving the money, and they require that the recipient organizations sign the "terrorism clause" in order to receive the donations [14]. The assistance provided by donor community, which is described by the World Bank as highly fragmented community itself [21], could alleviate some of the short-term effects of a socioeconomic crisis, but it will not produce durable results when not tackling the root causes of ill health [36]. Fragmentation of donors divided them into: 1. Donors who implemented their projects through the MOH, 2. Donors who chose other local or international NGO’s, and 3. Donors who they chose to implement their selected projects [14]. Furthermore, several initiatives for programs aid have repeatedly been reactive and not always encouraged institution building or created incentives for reform. Many donations are based on bilateral deals that suit the donors’ political guidelines and preferences over the Palestinians real requirements [94]. Additionally, agencies providing aid are circumscribed by the Israeli demands, and, scholars increasingly argue that aid agencies may well be complicit with siege policies by providing aid in a situation of imposed siege and deprivation [81]. International phenomenon schisms point to the special importance of understanding and combating the effects of the various politics of aid that exacerbate the destabilization of the public sector among NGOs, including UN bodies, and the MOH. [81]. By supporting the private and NGO sectors, funders help to undermine the MOH, and create overlapping and uncoordinated competing health sectors. This, along with the unrelenting hits that healthcare systems take with regards to materials and staffing, complicates the process of developing strong local control and leadership in the health sector; and results in infringing on several areas of functioning that are necessary for sound health systems, as determined by the WHO [81].

The positive impact of the assistance to the health sector can explicitly be observed in terms of increased health services capacity using external resources such as rehabilitation and expanding of the infrastructure of services, capacity building as well as installation of medical technologies. However, the impact of external factors on the national policy process has to be understood through the proliferation of bilateral and multilateral technical assistance projects [23]. According to the Palestinian Central Bureau of Statistics (PCBS), public aid has reduced poverty rates by 11.5%, with extreme poverty reduced by 20%. The PCBS indicates a significant increase in poverty rates in the Gaza Strip from 38.8% (in 2011) to 53% (by the end of 2017), This means that poverty increased by more than 14% over 6 years and reached 49.1% during the first quarter of 2018 [49]. With regards to implications, efforts to support effective healthcare systems in Gaza should focus on the very real needs for staff and infrastructure, rather than a preference for short-term projects or tangible goods [81]. However, in particularly considering aid-based solutions, practitioners must be careful to acknowledge the tension that, while there is a need to identify and support organizations with the greatest chance of remaining committed to long term care; aid is only necessary due to Israel's refusal to commit to its duties in the provision of health services and the protection of civilians in time of war under international humanitarian law. Aid is no substitute for the obligations that Israel has under such laws. Hope for improving the health and quality of life of Palestinians will exist only once people recognize that the structural and political conditions that they endure in Palestine are the key determinants of population health [36].The view of health in Palestinian Public Health Law as a fundamental human right should be integral to any efforts to establish a Palestinian State, while acknowledging limitations of resource availability and the need for self-sufficiency [94]. Serious improvements in security, restrictions on the movement of people and goods, and achievements on building Palestinian institutions [36] will increase the Palestinians’ ownership over the implemented projects and programs through being able to choose specific projects more aligned with the needs and the national strategy [14]. In addition, this will improve the ability of the Palestinian MOH to set priorities that address individual and national preferences and to negotiate with donors to avoid conflicting agendas and promote the welfare of the population.

### Leadership and Governance

The leadership and governance of health systems (also known as stewardship), is arguably the most complex but critical building block of any health system. It is about the role of the government in health and its relation to other actors whose activities impact on health [25]. It involves overseeing and guiding the whole health system in order to protect the public interest. It requires both political and technical action, with increased attention to important issues like corruption and right-based approach to health [25]. It represents the responsibility of the state for the welfare of its population [94].

The Palestinian health sector context has two distinguishing characteristics: 1. it operates in an environment of political instability and conflict under Israeli control, undermining effective governance system, and 2. its financial viability is severely constrained by its dependence on donor funding, which is subject to fluctuations related to political considerations [39]. This context of operation has put the system in front of continuous challenges related to political, economic, lack of control over resources, severe budgetary restrictions, underdevelopment and de-development that became key feature, including marginalization of government health services and ad hoc dependence on Israeli medical services [94] [78]. Internal mismanagement has promoted divides within the divide, with each stakeholder seeking its own financial survival. The highly centralized financial and staffing systems and the lack of will to provide value for money have impeded development. Vague institutional arrangements have hindered the establishment of a proper governance system characterized by transparency, separation of powers, and the rule of law [94]. Insufficient monitoring and lack of supervision have allowed cronyism and corruption, a lack of commitment and interest, and erosion of public trust and satisfaction. Adding to these challenges the challenge of lack of separation of functions in the health system: the MOH is payer, provider, and regulator of the health sector, a situation difficult to reform in the context of the political uncertainty [21]. Furthermore, the division between West Bank and Gaza has resulted in the creation of two separate governance structures with separate visions and strategies for the development of the sector. The MOH in Gaza regulates the sector directly, involving little communication with the MOH located in the West Bank; the MOH departments are duplicated and administered by different personnel. Finally, there is little coordination and cooperation between the government, UNRWA, private and NGO sectors. This detachment results in a system where the MOH is steward of the public system only rather than the entire sector. It sees NGOs and other providers as competitors rather than collaborators, with planning, including allocation of infrastructure and health staff, being done without consideration of overall sectoral distribution and needs [21]. This situation is not a unique situation of the health system, as the Palestinian Authority in general is facing a growing legitimacy crisis, with 80% of Palestinians surveyed reporting the belief that the Palestinian Authority institutions are corrupt, and more than half (53%) reporting that the Palestinian Authority has become a burden on the Palestinian people. Weak oversight, bribery, embezzlement, nepotism, and other forms of corruption are rampant in social services such as health care [22]. This situation is very dangerous and threatens potential collapse of the health system. The Palestinian professionals, who participated in my survey, have reflected this disastrous situation of the healthcare system and the inability of the MOH to control the system. A senior health manager from Gaza elaborated: **"*The toughest challenge I have noticed, whether here in Gaza or in the West Bank, is the inconsistency of the work of the medical organizations together. Each works in the way that helps the attainment of own benefits. The way each group is isolating itself with its own way of treatment and following up on patients and not being linked or communicating with the others, hinders and stands as an obstacle to the medical staff work, thus increasing the patients suffering. In fact, patients are at the end of the list in terms of priorities. I think each group is building their own kingdom that would make reconciliation and the unification of health system impossible*"**. Another senior staff nurse from the West Bank also mentioned: ***"We work in a situation where there is a lot of tension and conflict of interest. Despite all the obstacles and unfair treatment imposed by the occupation, we the Palestinians are fighting and caused the health system to be part of a political game. Health and education should be kept out of fights and politics if we have sincere intentions to build our systems and actually help our people"***. In addition, the results of quantitative survey have also confirmed the big challenges of the health system as characterized by mismanagement, corruption and the inability of the MOH to control the health system in Gaza, or to coordinate with other national healthcare providers. Only 28.9% (n=93) of professionals agreed that the appointment of managers and leaders in the health system was based on professional qualifications. 37.8% (n=119) of professionals agreed that MOH exercises its natural role as an overall coordinator/ regulator of healthcare system, and, 30.1% (n= 96) of the participants agreed that the MOH controls the healthcare system in the West Bank and Gaza effectively. Also, this situation has reflected itself not only on the MOH but also on the other providers as 38.3% (n= 127) of professionals agreed there is coordination between different healthcare providers in Palestine.

The Palestinian MOH recognizes its weak role in the organization, regulation, and supervision on the health sector; and in the coordination of policy making and planning among healthcare providers, especially those of the private sector [36]. Trying to overcome or at least to alleviate such challenges, the MOH published the current 2017-2022 health strategy [13], that adopts the "***comprehensive and integrated health system***" approach. While specifically the strategic objective number 5 in the health strategy focused on stewardship issues of healthcare system: ***"Enhance health governance, including effective management of the health sector, enforcement of laws and legislations, cross-sectoral coordination and integration among service providers"***; the MOH believes that such an approach would adhere to the principles of accountability, efficiency, quality, access to services, sustainability and equity. It would be responsive to community needs and seek to enhance the health status of citizens and secure financial protection against health costs [13]. It was clear to the MOH that such an approach is based on a national consensus that sustainable improvement of the health situation in the Palestinian society requires the establishment of a solid and effective integrated health system. This includes promoting public health programs, prevention and health awareness to reduce diseases prevalence, promoting community health, changing unhealthy lifestyles, as well as supporting; and enhancing and orienting the primary health care system towards the health of the individual and the family. Also the ability to ensure that the different diagnostic and curative services are available to all citizens and to enhance access to health services for marginalized groups, such as the poor, persons with disabilities, women and children, the elderly, and residents of marginalized areas, such as Bedouin communities in Area C, borderline areas, communities adjacent to the Separation Wall; and refugees living in camps and Gaza population [13]. Achieving sustainable health promotion and a healthy society requires addressing all aspects that affect community and individual health and contribute to health and wellbeing (determinants of health) through coordination and joint work with other relevant sectors (cross-sectoral approach). This requires attention to social aspects (education, income and economy), environmental aspects including water, food, pollution, safety at home, in the workplace and on the road, industrial and technological advancement in the country.

Several factors are believed to account for the inability of the ministry of health to assume the stewardship role needed to build a health system. Some of these factors are internal and some are external to the health and political systems [36]: (1) Despite substantial funding and efforts made by the Palestinian MOH to build a Palestinian health system, the obstacles to planned development have proved overwhelming. The principal reason behind the dire health care situation for Palestinians is the occupation [22]. Restrictions enforced by Israel since 1993 on the free movement of Palestinian goods and labor across borders between the West Bank and Gaza, and within the West Bank, have had damaging effects not only on the economy and society, but also on the attempts of the Palestinian Authority for system building. The physical separation and complicated system of permits required to go from the Gaza Strip to the West Bank resulted in the emergence of two Palestinian Authority ministries of health, one in the Gaza Strip and the other in the West Bank [36]. Since 2007, this separation has been further compounded by the political divide between the political factions Fatah and Hamas. (2) The absence of any control by the Palestinian Authority over resources like water, land, the environment, and movement within the Palestinian territory has made a public health approach to health system development difficult, if not impossible. These issues have been exacerbated by the dysfunctional political and institutional systems of the authority; the damaging effects on ministries of using the authority resources for patronage to secure loyalty; marginalization of the Palestinian Legislative Council (PLC); and corruption and cronyism; all of which led to a rapid increase in the number of health service employees of the Palestinian Authority without evident improvement in the quality of health services. These factors have adversely affected an already fragile health service [36]. (3) The multiplicity of donors with different agendas and the dependence of the Palestinian Authority on donor financial assistance as discussed in the earlier section, have also caused program fragmentation, competition between providers to get the fund, in addition to the political agenda and priorities of donors that have influential roles in determining the policies and priorities of the Authority.

In conclusion, effective stewardship is the most important feature of any successful initiative toward building an effective, efficient, and equitable healthcare system [94]. The Palestinian MOH should become empowered and increase its capacity to oversee and steer the entire system. Commitment from stakeholders, other than the ministry, is also important. The fragmented institutional framework hampers the governance and long-term development of the sector. Coordination of the health sector, particularly among the MOH, UNRWA, private sector, and NGOs, is a top priority. The health sector division between West Bank and Gaza impacts the overall effectiveness of sector governance, undermines efforts to implement reforms, and creates uncertainty vis-à-vis the long-term development of the sector [21]. Specific aspects of governance encompass leadership and vision by the government to translate the vision into actions that include the ability to maintain continuity despite turmoil, to seize windows of opportunity, to be responsive to population needs, and to be committed to accountability [7]. The MOH needs to revise the design and organization of the health system to clarify the roles of different types of facilities and providers. Top priorities are sectoral reintegration between the West Bank and Gaza; integration across the different providers in the health sector; donor coordination; and the separation of functions within the MOH. Stewardship after all is about collective rather than individual responsibility.

## Research Conclusions and Recommendations

In this chapter, I will provide the research conclusions and recommendations based on assessment results obtained from research participants who partook in my qualitative and quantitative research; and analyze the collected data to depict, present and suggest relevant conclusions and recommendations that should help in the actual development and reform of the Palestinian health system. In addition, I will highlight the prevailing environment in the context of the complicated existing health system. Moreover, I will underline the health models and existing relevant recommendations that have resonated positive results; or that may have potential to be applicable and fruitful within the context of the Palestinian healthcare system, and other similar systems that operate in the milieu of limited resource settings.

Research shows evidences and clear portrait of the actual existing conditions and all related consequences in which the Palestinian healthcare system operates. Therefore, the goal of this research is to present the challenges and to recommend practical and feasible reform agenda to the Palestinian healthcare system and likewise other countries that may encounter similar impediments, mainly in the LMICs. The specific objectives of the research are: To describe and better understand the challenges faced by the Palestinian healthcare system in the field of diabetes care; to analyze the challenges of diabetes care using the WHO health system framework in order to understand the relationship between the structure of the healthcare system and the context in which it operates; finally, to generate clear, evidence-informed and recommendations for the Palestinian healthcare system reform, based on the findings of this study, successful global models and experiences from other LMIC. In order to be able to understand and analyze the complexity of situation Palestinian healthcare system operates; the research adopted the mixed methods approach that combines elements from both qualitative and quantitative paradigms. The purpose of using this diverse methodology is to reach a high level of reflection of the wide-ranging challenges facing the Palestinian healthcare system that determine its functions and the quality of care provided. The mixed methods research broads the purposes of breadth and depth of understanding and verification, expands and strengths a study’s conclusions; and, therefore, contribute to the published literature. It will help in supplements and strengthening data sources to develop an in-depth understanding. This research discovers insights relevant to the structure of the Palestinian healthcare system and how it operates at all levels of diabetes care, and the context of challenges in which it operates.

The challenges that face healthcare systems in Low Income Countries (LIC) and Low-Middle Income Countries (LMIC) are substantial. Rapid changes and political instability make it difficult to plan for the future. The burden of Non-Communicable Diseases (NCDs) is increasing and escalating. This disease burden contributes to cost exacerbation in the health sector and will necessitate a greater focus on health prevention, primary care, and integrated disease management. Particular challenges to diabetes are the increasing prevalence, not all those with diabetes are diagnosed, and health systems do not have the capacity to care for those already in the system with diabetes. In parallel, most systems do not yet integrate health promotion and prevention, therefore, further increasing the burden on the system. This creates a vicious cycle of increasing numbers of people with diabetes and increased burden on the health system resulting in poor care [8]. The Palestinian healthcare system is functioning in a complex context. Factors that hinder healthcare system development are exaggerated and perpetuated under the oppressive conditions of the occupation and chronic conflict environment [94]. The occupation policies have continued to impose major barriers into the realization of the highest attainable standard of physical and mental health for the Palestinians in the West Bank and Gaza Strip. The occupation caused economic uncertainty, raised all kinds of costs, and shrunk markets, resulting in critical constraints on the survival of the Palestinian economy as a whole. The geographical divisions aggravated by the political conditions have produced two separate *de facto* government health systems, one for Gaza and the other for the West Bank [16]. It has entrenched both physical and administrative divisions of the Palestinian territory and population. The situation on the ground has led to the near impossibility of unifying and standardizing the two geographically isolated health sectors, creating redundancy in positions and bureaucracy, and widening the already existing gap between the two regions. The intensified siege and closure of the Gaza Strip and territory that is divided administratively into Areas A, B, C, H1, H2 in West Bank and East Jerusalem, has complicated the reform efforts; and the uncertainty about future developments, imposed by a fruitless peace process, aggravate the situation further. The health system fragmentation is a bigger problem identified within the Palestinian health context. Fragmentation was seen to have three main causes: the multiplicity of providers, the differing aims and priorities of donor organizations, and the difficulties caused by the political separation of the West Bank and Gaza. While international aid was seen as essential, it was also regarded as accentuating problems of coordination and sustainability [101]. The sustainability of quality healthcare provision is hampered by the fragmentation and the lack of territorial sovereignty, affecting access to health, public revenue, and creating a very complicated, bureaucratic permit system and situation of external aid-dependency. Endeavors to build capacity within the MOH and within health institutions were foiled by the overwhelming need to meet chronic emergency situations. This focus on emergency needs, however, has led to the abandonment of the goal of system-building [16]. Reform attempts turned once again to relief and drifted all efforts to system-building. For instance, years of work in developing national strategy to facing the high prevalence of NCDs, is interrupted by the debate on how to finance the very basic government health services due to the frequent shocks to the health system.

Eliminating the detrimental effects of the conflict and rebuilding the institutions, including developing the health care system, is a major task for the Palestinian community [23]. The efforts to support the building of an effective healthcare system in Palestine, should focus on the very real needs for the beneficiaries, staff and infrastructure, rather than a preference for short-term projects or tangible goods. Enhancing the sustainability of health care services requires a multifaceted and multisectoral approach [71]. Cooperation between ministries of health, education, and labor, among others, and enduring community engagement are required for a renewed commitment to a comprehensive primary health care system, investment in horizontal programming consistent with primary health care, and the implementation of innovative interventions and partnerships in health education, training, and research to enhance practice. As healthcare is largely determined by the decisions of political powers, the Social Determinants of Health (SDH) should be addressed by all different stakeholders using geopolitical and inter-sectoral approaches to overcome the growing challenges of health, social, and human rights [49]. Policy changes should focus on three aspects: (a) internal and external political will and commitment, (b) developing a comprehensive development plan based on cooperation and collaboration, and (c) ensuring that international stakeholders play more active and sustained roles.

Operating in such environment, the Palestinian healthcare system needs to adopt an innovative way of action in order to be able to deliver good services to people. The adoption of the Diabetes Comprehensive Care model (DCCM) which was implemented at the Augusta Victoria Hospital and the partner clinics in the West Bank and Gaza, has shown tangible results in improved diabetes control, prevention and early detection of chronic complications. Such a model could be replicated within the national system as way to improve diabetes care. The World Health Organization’s (WHO) model [44]‘Framework on integrated, people-centered health services’ emphasized the importance of organizing primary health care (PHC) around the comprehensive needs of people, rather than around a singular focus of specific diseases. When combined with population wide preventative measures, people-centered PHC can prove very effective in tackling diabetes and other NCDs both at the population and individual levels. The chronic nature and multiple comorbidities in people with diabetes and NCDs are targeted by the core principles of people-centered PHC. The family practice model of people-centered care must be continuous; that is, the patient/client returns to the same health worker over time; the care should be accountable, with each health team responsible for a defined population; community-base, close-to-client care that ensures improved access to PHC within the community; and care must be coordinated, with the PHC acting as the first point of entry and referring patients/clients to other levels of the health system where necessary. Such a model promotes improved prevention as well as the early detection and management of diabetes and NCDs. It enables health workers to work closely with people with a high risk of developing diabetes and NCDs and treat those with the early stages of a disease, thereby preventing the disease from advancing or developing complications. This is also an ideal environment for the implementation of cost-effective brief interventions such as the WHO recommendation of ‘Best Buys’. If required, PHC workers can then efficiently refer on patients/clients who require specialist care. Thus, PHC represents the most appropriate and equitable framework for implementing individual health care interventions for NCDs. The Framework-based analysis identified short-, medium- and long-term health system reforms for the optimal integration of diabetes and NCDs into PHC. When considering the challenges that lie ahead, it should be remembered that diabetes and NCDs integration in people-centered PHC cannot occur in isolation; instead, it should be part of a wider health sector reform that is a continuous process. This is the case for several Eastern Mediterranean Region countries currently expanding their essential service delivery package, models of care and healthcare financing. Thus, integrated people-centered PHC services form a crucial component of strong health systems and are vital for moving closer to Universal Health Coverage (UHC), especially in the Eastern Mediterranean Region and in the LMICs [44].

The function, structure and the reform of the Palestinian healthcare system are linked to, and highly dependent on, the future political scenarios of peace between Israel and the Palestinians and the reconciliation between the Palestinian political factions. With the hope for a realistic and just peace process as narrow as it has been in decades, and the two-state solution diminishing, Palestinians cannot wait for a political agreement before they are afforded access to safe, high quality, and reliable health care. Strategies and recommendations for strengthening respect, protection and fulfilment of the right to the highest attainable standard of physical and mental health for Palestinians in the Palestinian territory have been put forward by the special rapporteur on the situation of human rights in the Palestinian territories [18]. There is a need to abide to the following recommendations as well as for all duty bearers to take steps to ensure their realization:

1. To ensure regular and reliable access, at all times, for all Palestinian patients who require specialized health care outside of their jurisdictions, consistent with genuine Israeli security concerns;
2. To end the conditions that obstruct the free passage of Palestinian ambulances to access and transport patients to health care facilities in an expeditious fashion;
3. To ensure the respect and protection of medical personnel and medical facilities as required by international humanitarian law;
4. To remove the unnecessary barriers that prevent Palestinian health care staff from acquiring professional training and specialization elsewhere in the occupied Palestinian territory and abroad; and to receive training at their home institutions from international health professionals;
5. To take meaningful steps to improve the many social determinants that influence health outcomes in the Palestinian area;
6. To comply fully with its obligations under international human rights and humanitarian law with respect to fulfilling the health needs of the protected population.

Though such actions would undoubtedly help support the Palestinian healthcare system and health outcomes, at base the Palestinian Authority must commit to contend with the underlying political causes limiting Palestinians’ access to proper health care. A health care system should not be at the mercy of the occupation, political divisions, or dependent on external aid and the merciful motivations and priorities of donors.

The findings of my research have showed that using the WHO’s six health system building blocks is useful in the assessing and analyzing the challenges that face the Palestinian healthcare system. The six blocks also allow identifying different improvement opportunities and recommendations that help in better system management and reform. In addition, there is no contradiction between the indicators of the WHO health systems building blocks and the health sustainable development goals (SDGs) objectives [54]. Although, the uniqueness of the context of the Palestinian healthcare system operates in a chronic conflict situation, this creates further challenges that go beyond the six WHO health systems building blocks and should be taken into consideration. Territorial, system fragmentations, and the political divisions between the Palestinian political factions have led to a situation of corruption, mismanagement and freezing in the legislative system. Such unique themes highly impacted the performance of the Palestinian healthcare system and have necessitated actions to alleviate the suffering of patients and communities to access health care. Specific recommendations regarding the six WHO building blocks for the Palestinian healthcare systems and the indispensable actions to move forward for the best interest of Palestine are:

1. **Service delivery:**

Service delivery is the what and how healthcare is delivered in a given context, and should be effective, safe, and centered on the patient’s needs. Care should be continuous and coordinated between different levels of the health system, diseases, and ages. It should also provide a comprehensive range of services from health promotion, prevention, curative, palliative, and rehabilitation. The way forward to the development and reform of the Palestinian healthcare system should include: Promote primary health care as the effective backbone of the healthcare system by increasing investment in primary centers and public health activities (e.g., surveillance and preventive programs for chronic diseases); Integrate and coordinate all providers and human-resources activities, with clear division of roles, responsibilities and tasks; Improve access to care throughout all geographic populated areas; Advocate assertively for the right of patients to reach their clinics freely and on time despite imposed checkpoints and the need for permits; Include interventions for the prevention and control of diabetes within existing national programs for nutrition, physical activity, maternal and child health, and cardiovascular disease in primary care; Implement appointment system in all clinics and community health centers; Promote the intake of healthy foods and reduce the intake of unhealthy foods and sugar-sweetened beverages. The policy tools should include fiscal measures to raise the price of sugar-sweetened beverages and unhealthy foods, and/or lower the price of healthier foods; regulation of marketing of food and non-alcoholic beverages to children; nutrition labelling; and a package of interventions to improve early childhood nutrition, including promotion of breastfeeding; Maximize the impact with multi-component programs involving policy changes, settings-based interventions, mass media campaigns and education. Prioritize highly vulnerable and/or disadvantaged groups; Adapt and implement a comprehensive primary healthcare package for the diagnosis and effective management of all types of diabetes, including unified management protocols and referral criteria; in the context of integrated NCDs management; Promote education and awareness around self-care practices and regular check-ups to facilitate early detection and treatment of complications; and finally, Promote home visits and implementation of healthy lifestyle activities in the community and outside the health clinics.

1. **Health Workforce**:

The health workforce includes not only the individuals within the health system whose role is to improve health, but also their knowledge, skills, and motivation in delivering health services. The following actions need to be adopted for purposes to develop and reform the Palestinian healthcare system: Revise the available plan for human resources and its conformity with established policies, plans and prevailing gaps; Assess available training programs and activities in terms of their quality and appropriateness; Improve access to training and certified courses through the use of telemedicine and new available training technologies; Build human capacities in planning, financing, and provision of health care; Strengthen monitoring and supportive supervision; Develop a results-based system of rewards and sanctions, with transparent tracks of career progression; Regulate and/or eliminate dual practice of healthcare workforce; and finally, Enhance the skills and capacity of healthcare teams to provide comprehensive diabetes care.

1. **Information:**

Information is an essential tool for the health system. The information system needs to generate, compile, analyze, and synthesize data in order to help with decisions to improve the delivery of care and the way the health system operates. This can be at the level of an individual with a patient file, a facility-based register, statistics and surveillance systems as well as research and epidemiological studies. The way forward related to information system include: Upgrade the current health-information system to an electronic system that allows sharing needed information for all levels of diagnostic, clinical and administrative decision-making processes; and among all related providers; Develop national clinical management and administrative protocols, while involving those to whom the evidence is addressed in the process; Promote a culture of evidence-based decision making at all levels of healthcare planning; and provision through on-job capacity building, and intensive follow-up; and supportive supervision; Ongoing research into risk factors and prevention of all types of diabetes; Innovative intervention research to expand the evidence base for promotion of physical activity; Implementation research to better understand the scope and scale of health-system strengthening; Introduce or strengthen existing vital registration (morbidity/mortality) and cause of death registration systems to better reflect the role of diabetes as the primary or underlying cause of death; Strengthen national capacity to collect, analyze and use representative data on the diabetes burden and trends; Develop, maintain and strengthen a diabetes registry if feasible and sustainable; and include information on complications. This can be more easily achieved when electronic medical files are used.

1. **Medical products and technology**

Health systems need to guarantee equitable access to medicines and other technologies, which are of assured quality, safety, efficacy, and cost-effectiveness and ensure that these are used in an evidence-based and cost-effective manner. The way forward to a better healthcare system performance in this building block includes: Promote rational use of drugs and effective drug management to increase accessibility and avoid wastage of scarce resources; Revise practices of purchasing, prescribing, and dispensing to focus on the most cost-effective medications and technology; Implement policies and programs to ensure equitable access to affordable essential medicines and technologies (including diagnostic equipment and supplies); Introduce options to improve access to insulin and other diabetes medications; Provide all diabetes patients, particularly children and pregnant women, with glucometers and testing strips; and finally, Advocate for free access of medicines, supplies, equipment and the maintenance material to enter Gaza on time and as needed.

1. **Health Financing:**

In Palestine as other LICs and LMICs, a high proportion of money for healthcare comes from individuals in the form of out-of-pocket expenditure. The challenge in LICs and LMICs is to provide financial protection to the population with a very low formal sector and tax base. Financial system reform is crucial to minimize health inequalities and foster access to healthcare. The development and reform of health financing should include: Transform the current Palestinian Authority health insurance scheme into a sovereign and accountable legal entity with control over its own resources; Promote Universal Health Coverage in congruence with Sustainable Development Goals and the WHO recommendations; Promote community-based health financing to cover the health-care costs of various categories of the population; Integrate a system of payment by capitation for primary health care and per admission for inpatient care; Work towards institutionalization of a genuine universal scheme of social insurance; Establish a single treasury account for the donors to reduce duplication and wastage of resources; and finally, Increase and prioritize national budgetary allocations for addressing diabetes and key risk factors.

1. **Leadership and Governance (Stewardship):**

The governmental institution in LICs and LMICs responsible for addressing the challenge of diabetes is the Ministry of Health. As such, Ministries of Health play a critical leadership role in organizing and delivering care, as well as, involving other national stakeholders in health-related issues. The way forward to reform the duties and functions of the MOH should include: Empower the Ministry of Health through appropriate regulations and enhance capacity of planning and supervision; Collectively redefine a vision for the healthcare system; Enhance intersectoral collaboration at all levels of planning, financing, and provision; Promote transparency and end cronyism of public employment; Continue commitment to addressing diabetes as a priority in national NCD responses; Strengthen the capacity of ministries of health to exercise a strategic leadership and coordination role in policy development that engages all stakeholders across government, nongovernmental organizations, civil society and the private sector; ensuring that issues relating to diabetes receive a coordinated, comprehensive and integrated response; Ensure that national policies and plans addressing diabetes are totally cost estimated; then funded and implemented; Foster accountability by setting national targets and indicators for diabetes, obesity, physical inactivity, availability of essential medicines and basic technologies; and reductions in premature mortality resulting from NCDs, taking into account the NCD-related Sustainable Development Goal targets for 2030; and finally, Create supportive built and social environments for physical activity, transport and urban planning policy measures that can facilitate access to safe, affordable opportunities for physical activity.

Strength and Limitations of the Study: the strength of this study is due to the fact that it is the first study of its caliber uniquely conducted by utilizing the World Health Organization (WHO) health systems building blocks as a framework, harmonized by implementing the mixed methods approach in order to provide holistic in-depth understanding of the Palestinian healthcare system that operates in very complicated politico-economic context and unpredictable force majeure circumstances. As for the limitations, one of the study limitations was that only the respective frontline professionals and managers within the healthcare system were included in this study. The views and perceptions of diabetes patients, local communities, external donors and other stakeholders have been constrained, though they are considered extremely important to fully understand the health system and should contribute crucially for the reform plan of the health system that should be addressed in future studies. As a cross-section research, it was obvious that the chronicity of the conflict, financial and political crises at the time of the study have highly influenced the professionals’ perspectives on the healthcare system. The use of the mixed methods approach has alleviated such limitation; but still the research has shown the influence of the major events and situations that took place at the time of the research. Actually, there were limitations connected to the number of health professionals who participated in the quantitative survey, mainly from NGOs, Private sector and the UNRWA in Gaza. Finally, the access to internet and computers in remote clinics and in Gaza has negatively reduced the number of participants in the research.

Notwithstanding, there are no simple solutions for addressing diabetes; but coordinated, well-planned multicomponent intervention can make a significant difference. Everyone has a role to play – governments, health-care providers, people with diabetes and those who care for them; civil society, food producers, manufacturers and suppliers of medicines; and technology are all stakeholders that should work effectively together. Collectively, they can all make a significant contribution to halt the rise in diabetes and improve the lives of those living with the disease.

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# Annexes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Appendiex1: Summary of innovative diabetes care models in low-resource countries (Esterson Y. et al, 2014)** | | | | | |
| **Model** | **Region** | **Strengths** | **Strategic Partnerships** | **External Funding** | **Government Support or Involvement** |
| Rural and Semi-Urban Diabetes Prevention and Control Program | Vellore | * Collaboration among academic centers, research centers, and international organizations with approval of local government. * Development of extensive diabetes care training programs. * Practical, hands-on training. * Opportunities for distance learning. * Success in terms of personnel trained and diabetes clinics established. * Community involvement through education and screening programs in local schools and colleges. | √ | √ | √ |
| The Ghana Diabetes Care Model | Ghana | * Directly putting responsibility on natives. * Collaboration among academic centers, companies, and local government. * “Top-down” approach. * Standardization of diabetes care guidelines | √ | √ | √ |
| The Step-by-Step Diabetic Foot Project | India and Tanzania | * Collaboration among academic centers and international organizations with approval of local governments. * Top-down approach. * Directly putting responsibility on local doctor/nurse teams. * Practical, hands-on training. * Development of an algorithm for diabetic foot care. * Improvement in rates of amputation. * Establishing permanent diabetic foot clinics. * Development of education materials specific to patients. | √ | √ | √ |
| Directly Observed Therapy, Short course (DOTS) for Diabetes | Malawi | * Use of an electronic medical record. * Use of patient “passports” to easily access patient information. * Standardization of diabetes care guidelines. * Improvement of medication supply in the region. * Training of dedicated diabetes nurses. * Establishing a national diabetes register. * Collaboration among academic centers, international organizations, and government. |  | √ | √ |
| The South Africa Chronic Disease Outreach Program | Soweto | * Increasing the responsibility of nurses. * Increasing the knowledge and skills of nurses. * Referring patients in an appropriate and timely manner for specialist care. * Collaboration of an academic center with an organization, a private company, and local government. * Sought feedback from participating nurses |  | √ | √ |
| The Non-Communicable Disease Management Model | KwaZulu-Natal | * Increasing the responsibility of nurses. * Empowerment of nurses to manage the high majority of Non-Insulin-Dependent Diabetes Mellitus (NIDDM) cases. * Use of prescription cards that allowed patients to collect six months of medications before returning to the clinic. * Development of a standardized treatment algorithm. |  |  |  |
| The Community Care Program | Ethiopia | * Increasing the responsibility of nurses. * Collaboration among academic centers, international organizations, and local government. * Increasing access to care. * Establishing diabetes clinics in four regions throughout the country. | √ | √ | √ |
| Peers for Progress | Cameroon, South Africa, Thailand, and Uganda | * Use of peers to fight the diabetes epidemic * Demonstrating that peer support models can be implemented in diverse healthcare settings. * Improvement in health outcome measures. * Use of technology to facilitate care | √ |  |  |
| Automated Monitoring and Self-Care Support Calls Model | Honduras, Mexico, and Bolivia | * Use of technology to facilitate care. * Collaboration among academic centers, telecommunication companies, and public health authorities. * Improvements in health outcome measures. * Demonstrating that a model based on automated monitoring and self-care calls can be implemented successfully in a variety of Latin American countries. | √ |  |  |
| The Community-Based Nutrition and Exercise Program, and the Integrated Intervention Program | Costa Rica and Shanghai | * Short-term, intensive patient education and exercise initiatives can have important health effects. |  |  |  |

**Appendix 3: Relationship between and integration of qualitative and quantitative methodologies**

**Connection Point**

Developing questions & Quantitative research tools and themes

**Coding & Buildings Categories**

**Quantitative Research**

**Design, pilot, validate, and distribute survey to healthcare professionals from MOH, UNRWA and NGOs**

**Qualitative Research**

**Semi- structured interviews with "Policy makers, health leaders, managers, and healthcare professionals"**

N=

**Integration**

**Integrating qualitative research findings & quantitative research**

**Content analysis using qualitative software**

**Statistical analysis-SPSS**

**Descriptive, univariate, multi-variate**