

**An-Najah National University**  
**Faculty of Graduate Studies**

# **The Impact of Medications on Daily Lives of Patients with Cardiovascular Diseases: A Cross Sectional Study**

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## **Dedication**

This work is dedicated to the soul of my father, who would have been thrilled to see this work come to life, whose love and care inspire me in every single step in my life; I will always do my best just to make you proud.

(May GOD rest your soul in peace)

It is dedicated to my mother for her endless love, support, encouragement, who taught me perseverance in setting my objectives and achieving them and gave me the strength to face all challenges.

And it is dedicated to my beloved sisters and brothers who shared their words of advice and encouragement to complete this thesis.

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أنا الموقع أدناه، مقدّم الرسالة التي تحمل العنوان:

**The Impact of Medications on Daily Lives of Patients with  
Cardiovascular Diseases: A Cross Sectional Study**

أقر بأن ما اشتملت عليه هذه الأطروحة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد. وأن هذه الرسالة كاملة، أو أي جزء منها لم يقدم من قبل لنيل أي درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

**Declaration**

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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## List of Symbols and Abbreviations

ACE-I	Angiotensin Converting Enzyme Inhibitors
BNP	Brain Natriuretic Peptide
CCB	Calcium Channel Blockers
CRP	C-Reactive Protein
CSE	Cardiac Self Efficacy
CVD	Cardiovascular Disease
DRP	Drug Related Problems
ECG	Electrocardiogram
HF	Heart Failure
ISPOR	International Society for Pharmacoeconomics and Outcomes Research
LMQ	Living with Medicine Questionnaire
MRB	Medication Related Burden
NCD	Non Communicable Diseases
PRN	As Needed
QOL	Quality Of Life
SPSS	Statistical Package for Social Sciences
VAS	Visual Analogue Scale

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**Abstract**

**Background:** Multiple long-term cardiovascular medication use affects different aspects of patients' daily lives and quality of life, which creates a burden for patients. The burden of medications critically affects their medication beliefs, behaviours, and disease outcomes. Evaluating medicines' burden from the patients' perspectives is a crucial endeavour to identify barriers that may hinder achieving optimal health outcomes. The present study aimed to exploit the Arabic version of Living with Medicines Questionnaire-3 (LMQ-3) to quantify the medicine burden among cardiovascular patients, assess the effect of chronic cardiovascular medication use on different aspects of patients' daily lives, and to examine the relationship between demographic and clinical characteristics of the patients' daily life score.

**Methods:** The study was a cross-sectional observational study; patients were included from community pharmacies who used cardiovascular medication in Jerusalem, Palestine, from January to October 2019. The data collection form consisted of demographic and clinical information about the patients, Living with Medicines Questionnaire version-3 (LMQ-3), which measures the impact of medicine use on patients' daily lives and a

visual analogue scale (VAS), allowed the patient to express his or her overall perceived medication burden which is a scale from 1–10 that measures global burden, with anchors indicating no burden at all to extremely burdensome.

**Results:** A total of 380 patients were included in this study. Their mean age ( $\pm$ SD) was  $58 \pm 12.2$  years, the majority of patients have health insurance (292, (76.8%)), 227 (59.7%) were living in urban areas, and 259 (68.2%) patients had hypertension. According to our present research, the LMQ domain score revealed a significant burden among the female gender, living in urban areas in comparison to rural or camps, without insurance, with one or two diseases, using 1–4 medicines, using solid oral dose with other non-oral formulations for some domains in which level of significance was determined at  $P < 0.05$ . The vast majority (96.3%) of respondents self-reported suffering from a minimum (39.2%) to moderate (57.1%) degree of burden. The median (IQR) LMQ overall score was 108 (19.8), which is considered a moderate burden. Furthermore, the present research indicated that the evaluation mean  $\pm$  SD of the global burden by the VAS score was  $5.2 \pm 2.3$ , which indicates medium burden.

**Conclusion:** Healthcare providers should acknowledge the impact of multiple long-term medicines on patients' daily lives and make an effort to diminish patients' medication-related burden by using LMQ- 3 personally to provide individual tailored therapeutic care plans to achieve the best possible benefits for patients. Additionally, expanding pharmacists' roles,

especially clinical pharmacists, can assist doctors in estimating a patient's medication related burden through the implementation of pharmaceutical care.

**Keywords:** cardiovascular medication; medication-related burden; medication adherence; patient experience; Living with Medicine Questionnaire; daily lives.

# **Chapter One**

## **Introduction**

### **1.1 Background**

Multiple medication prescriptions for patients with chronic disease usually impact their cognition and function and raise the possibility of drug interactions and adverse events (Runganga et al., 2014). Chronic diseases are the most significant cause of death globally, with the majority of deaths being from cardiovascular disease (CVD) (mainly from ischaemic heart disease and stroke), followed by cancer (Yach et al., 2004). In 2015 an estimated 17.9 million people died from CVD, 31% of all global death (Fuller et al., 2018).

Cardiovascular diseases (CVDs) are disorders of the heart and blood vessels, consisting of heart failure, stroke, ischaemic heart disease, and other cardiac and vascular disorders. Patients' quality of life is significantly reduced by these diseases, and noticed an increasing in the probability of disability. More time, resources and energy are spent by patients to stay well (Hajar, 2016, Mensah et al., 2019, Eton et al., 2012).

Burden experienced by patients with these chronic health diseases is not only related to the illness itself, but also linked to the regimens of the healthcare that are ever-expanding, comprising keeping medical appointments, monitoring health, diet, medication-taking and exercise. A spiral of negative consequences can be triggered by excessive healthcare burden. Non-compliance with recommended medications and care will

result in more hospitalizations, more intensive therapy and a higher mortality rate (Eton et al., 2012). These chronic conditions usually require complex self-management of both medical interventions and disease symptoms, which involve essential demands on patients' time, effort and finances (Katusiime et al., 2016).

Multiple medications are prescribed to treat and prevent CVD. Usually, these treatment regimens are complex and used until the end of patients' lives, which creates a burden for patients (Gallacher et al., 2011). Polypharmacy use enhances the risk of drug-related problems (DRPs) – for instance, drug interaction, hospitalization, non-adherence and adverse drug events (Salazar et al., 2007).

Medication-related burden is classified into five dimensions: burden related to adverse effects; the healthcare system; medication routines; social aspects; and medication characteristics (Mohammed et al., 2016). Patients with a large number of medication-related burdens may find an increase in the negative impact on their quality of life and daily lives (Eton et al., 2012), with a fundamental problem with prescribed regimen adherence (Demain et al., 2015). Several studies measure the knowledge of and adherence to medication in Palestinian society, but to the best of my knowledge there has been no research on the burden of using the drugs, whereby the treatment burden results in poor clinical outcome, increased mortality and morbidity, more hospitalization, fractures, demand for

nursing home care and an increase in healthcare costs (Demain et al., 2015).

To optimize medicine utilization in these patients, there is a considerable requirement to realize their difficulties, attitudes, experiences and concerns (Katusiime et al., 2018). However, most published research concentrates on the biomedical perspective, ignoring the patients' viewpoint (Krska et al., 2014). Furthermore, patient experience is a crucial element to the measuring of the quality of healthcare and also to improve healthcare safety, and patient outcome (Institute of Medicine, 2001), especially because some patients with polypharmacy prefer not to take medicines or to stop some or all of their medications (Krska et al., 2017b).

Medicine-related burden is a relatively new concept (Mohammed et al., 2016); this makes the need not only to understand that burden but also to measure it (Katusiime et al., 2016), especially in patients with CVDs on whom limited research has been performed (van der Laan et al., 2018).

One of the recent questionnaires developed for measuring overall medicine burden is the Living with Medicines Questionnaire (LMQ) (Krska et al., 2014, Krska et al., 2017b), which investigates numerous parts of the burden of medication utilization from the patient's perspective. In addition, the value of this questionnaire comes from assessing several issues, such as adherence to the treatment plan, patient relationship with healthcare professionals and also adverse drug reaction (Krska et al., 2014). This will assist in determining patients' views of drug therapy and its effects on their



lives (Zidan et al., 2016). This questionnaire differs from other instruments that are used to measure patient experience with medicine use because it covers more domains. This questionnaire deals with eight interrelated dimensions of medicine use experience: perception about medication effectiveness; concerns about medicine utilization; patient–providers relationship and communication concerning medicine; practical complexity; intervention with their daily life; autonomy/control over medicine ,side effects and cost burden. (Krska et al., 2017b).

### **1.1.1 Cardiovascular disease and its impact on the patient’s life**

CVDs are a group of heart and blood vessel disorders, including coronary heart disease, peripheral arterial disease, rheumatic heart, and cerebrovascular disease (Hajar, 2016). It is a major contributor to disability (World Health Organization, 2004). CVDs are the number one cause of death – the number of deaths from CVD is 17.9 million people each year – and CVD ranks top of ten killer non-communicable diseases (NCDs) (Collier and Kienzler, 2018). CVDs are one of the leading causes of morbidity and mortality in the occupied Palestinian territory. In Palestine, CVD is the leading cause of death. (Abu-Rmeileh et al., 2012). Various emotional and physical symptoms are usually experienced by sufferer with a history of CVD, such as sleep difficulties, fatigue and edema limiting their social and physical activity, resulting in poor life quality (Komalasari et al., 2019). Many patients experienced functional and productivity loss as a result of CVD; additionally, a lack of insurance and reduced income were

linked to this loss (Calcagno et al., 2016). The effect of the consequence of CVD and the therapy itself can be positive or negative; symptoms may decrease, with the enhancement of function and sense of well-being; or the treatment may be deleterious, causing new symptoms, side effects, or a reduced sense of well-being and ability to function (Wenger et al., 1984).

Many factors, such as good medication adherence, daily physical activity, and controlling risk factors, have a positive impact on the quality of life of patients with CVD (Ludt et al., 2011).

### **1.1.2 Pathophysiology of the cardiovascular disease**

The major cause of CVD is atherosclerosis; multiple risk factors contribute to forming atherosclerosis blocks, such as dyslipidaemia, hypertension, cigarette smoking, immunological phenomena, inflammation, and endothelial dysfunction. These risk factors contribute to multiple processes, including oxidation and inflammation in the artery wall, which contribute to the development of fatty-fibrous lesions over time. Heart attacks and strokes may be caused by inflammation, lesion rupture or physical trauma (Scott, 2004). C-reactive protein (CRP), an inflammatory marker, is used to monitor disease progression, inflammatory marker CD40 and the cardiac myofilament protein troponin, the early warning signs of heart attack. Cardiovascular hypertrophy occurs as a consequence of neuro–humoral and biomechanical processes seen in hypertension, which predisposes to heart failure via apoptosis. In addition, coronary artery disease is a common cause of heart failure (Scott, 2004, Davies et al., 1988).

The hallmark of ageing hearts is increases production of pro-inflammatory markers, including high-levels of IL-6, TNF, and CRP (Curtis et al., 2018).

CVD prevalence is linked to increased overall myocardial degeneration and deterioration, apoptosis, inflammation and oxidative distress (Davies et al., 1988). Heart failure, arterial fibrillation, and other CVD are common as a result of functional and electrical defects in the heart (Steenman and Lande, 2017). Cardiac damage results in permanent loss of cells because the heart cannot regenerate (Scott, 2004).

### **1.1.3 Diagnosis of cardiovascular disease**

Patients with CVD suffer from several symptoms, which include trouble breathing, chest pain and tightness, discomfort, especially when they are highly active, pain, numbness, and weakness in arms or legs if blood vessels there are narrowed (Jin, 2018).

The methods that doctors use in diagnosing cardiovascular disease usually depend on the heart disease that the patient has. General methods for diagnosis of CVD depend on a number of laboratory tests and imaging studies, the patient's medical and family history, physical examination, risk factors, and the integration of these results with the tests are the most crucial elements of diagnosis.

#### 1.1.4 Common test used in diagnosis CVD

- Blood test: TroponinT-Test which measure the level of cardiac specific troponin, the marker of choice to detect heart attack; other biomarkers that also appear include fibrinogen and PAI-1, elevated asymmetric dimethyl arginine, high level of homocysteine, and elevated brain natriuretic peptide (BNP).
- Electrocardiogram (ECG): records the electrical signals of the heart (its rhythm and how fast the heart is beating), the strength, and timing of the electrical signal, which identifies conduction disturbances, that assists in the diagnosis of heart disease, including myocardial ischaemia, arrhythmias, and angina. Infarction or ischaemia is indicated by ST-segment elevation or depression. Chamber hypertrophy is characterized by large voltage QRS complexes, downward-sloping ST segments, and T-wave inversion. Exercise stress testing is a proven diagnostic test for symptomatic coronary artery disease that is also used to evaluate individuals with established cardiac illness. (Garner et al., 2017). Other tests that also contribute to diagnosis are cardiac computerized tomography, echocardiography, coronary angiography chest X-ray, myocardial perfusion scan (MPS), cardiac magnetic resonance imaging (Wedro and Davis, 2020).

### **1.1.5 Cardiovascular disease treatment**

Maximizing patients' quality and quantity of life and preventing more deterioration in their status are the main goals of treating cardiovascular disease. Generally, once the plaque has begun, limiting its progression is possible by using appropriate medicine and preserving a healthy lifestyle with regular exercise and healthy food (Palmiero et al., 2019).

The major drugs that are used in treating and preventing CVD are:

- Aspirin, which makes platelets less sticky with its activity as an antiplatelet, which minimizes the risk of heart attack, the present of other risk factors for heart disease, determine its routine use.
- Beta-blocker: helps in inhibiting the activity of adrenaline on the heart, decreases the heart muscles' oxygen demand, helps the heart beat more efficiently and slows the heart rate.
- Calcium channel blockers (CCBs) assist the myocardium contraction and pumping to be more effective.
- Nitrates: dilate arteries so that they increase blood flow to the cardiac muscle (Wedro and Davis, 2020).

## **1.2 Literature Review**

In 2018, a study was conducted by van der Laan et al. (2018) to measure the impact of cardiovascular medication use on patients' daily lives by using LMQ; 196 patients from the Netherlands with long-term medicine use participated. A serious proportion of these patients experienced MRB in their everyday life, especially due to the intervention of medicines with daily and social life and lack of communication with healthcare professionals.

In 2015, Shareef et al. (2015) conducted a study among Indian patients to identify drug-related issues in cardiovascular disease patients. A total of 112 patient cases were examined in this report. Drug interaction was the most common drug-related issue (49.05%), followed by adverse drug reactions (18.86%) and failure to receive the drug (9.43% ). This research demonstrated the value of a pharmacist in a multidisciplinary team who reviews drug therapy on a regular basis so as to identify and address drug-related problems, achieve better therapeutic outcomes and improve patient care.

Furthermore, in 2011, Gallacher et al. (2011) performed a secondary analysis of qualitative interview data for 47 patients with chronic HF in Britain to understand the treatment burden in these patients. They discovered that the healthcare burden in those patients included the large number of medicines and appointments, obstacles to obtaining services,

inconsistent and poorly structured care, a lack of continuity, and insufficient coordination between health professionals.

In 2013, Janet Krska et al. conducted a study on patients taking long-term medicines to measure the effect on their day-to-day living, especially the influence on the quality of life (QOL). The majority of the patients' had established routines for using multiple medications. Some required great effort; some had unpleasant experiences of discussing concerns with their doctor, and the social activities of patients were restricted.

On the other hand, in a cross-sectional study conducted by Sav et al. (2016) on 581 participants with various chronic diseases, patients were asked about treatment burden by concentrating on five dimensions: social life; medication; financial burden; time and administrative; and lifestyle change. In this study, the risk of treatment burden was observed more in young patients with chronic disease, metabolic disorders (diabetes), endocrine disease and those with unpaid careers.

In 2017, a study that was undertaken by Singh (2017) in India explained that half of cardiovascular patients did not use their medicine as directed. Several factors contributed to their non-adherence. Some were related to patients, such as a low ability to read and write and a shortage of participation in the process of treatment decision-making. In addition, those factors related to the physicians included complicated regimen and lack of communication with patients, and those related to the healthcare systems included hard access to care.

In 2015 a research that was performed by Bansilal et al. (2015) regarding the prevention of cardiovascular disease showed that compliance to cardiovascular treatment was very low in patients with chronic disease, particularly with patients who used many pharmacological agents, which resulted in direct and indirect healthcare costs.

Furthermore, in 2013, Reeve et al. performed a study among Australian older patients taking ten medicines. The study found that 60% of patients reported using a large number of medications, discontinuation willingly of one or more of their medicine was seen in 92% of patients, and cessation of medication use was largely accepted by older adults.

In 2016 Zidan et al. (2016) performed a translation and cultural adaptation of the LMQ into the Arabic language, by obtaining permission from the original developers (Krska et al., 2014), which was done by using the guidelines of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) for the translation and cultural adaptation of patient-reported outcome measures. This translation generates a culturally suitable translation of the LMQ, identical to the original English tool, to be used in Arabic countries in clinical practice and research.

In 2008 Wu et al. (2008) performed a study to explore medicine adherence among patients with HF and which factors influence them, through an in-depth interview for seven women and nine men with HF. They found that education and explanation from healthcare providers help patients



comprehend their disease, symptoms, and how medicines effectively decrease their symptoms and greatly benefit adherence.

Another new study that was performed by Van Der Laan et al., (2018), who identified the main factors that were linked to non-adherence to cardiovascular medications, the study collected information on 255 patients from 23 community pharmacies regarding patient medications, demographics, illness characteristics, quality of life, knowledge, behaviour toward medicines, and satisfaction with knowledge. This study explains that forgetting, having insufficient cognizance on what to do if the dose is missed, having a hesitating attitude towards medications, are the primary factors associated with patients' non-adherence. Many intervention strategies must be used to improve cardiovascular medication adherence by using tools to prevent forgetting; also, patients' beliefs about medicines should be addressed.

In 2019 Bahall (2019) performed a study using a questionnaire to gather information about medical background, socio-demographic traits, social support, and reasons for medication non-adherence in the cardiac clinic, to identify reasons for medication non-adherence and its related causes. In this study, carelessness, ceasing medication use when feeling well, forgetfulness, and ceasing medications when feeling worse were the main causes for non-adherence, followed by cost and the unpleasant effects of medication. According to this study, there is a strong need for productive communication between patients and healthcare professionals with regard

to patients' concerns and potential adverse drug effects in order to promote greater adherence.

In 2006, a study conducted by Kulkurini et al. (2006) assessed the adherence to evidence-based cardiovascular medicine prescribed when discharged from hospital by studying 1326 patients who suffered from coronary artery disease and their adherence to B-blockers, statins, and angiotensin-converting enzyme (ACE) inhibitors. Patients who were using these medications from one year were considered adherent; only 54% of patients were adherent to the medication. Discontinuation of medication was seen in elderly, women, unmarried, less educated, and patients with a larger number of prescribed medicines. In contrast, better adherence was seen with strong mental health, elevated educational level, married marital status, and non-user of antidepressant. Neither physical function nor insurance coverage correlated with adherence. There is a massive need for healthcare professionals' awareness of patients' factors that influence adherence.

Furthermore, in 2014 Caldeira et al. (2014) performed a random meta-analysis study on patients with chronic cardiovascular disease by comparing variant dosing regimens (once-daily use versus twice or more daily administration) and evaluated adherence to treatment. They found that a dosing regimen with once-daily use was linked with a 56% reduction in the risk of non-adherence to the medicine. So taking medications once per day decreases the possibility of non-adherence to 50%.

In 2006, Ho et al. (2006) identified factors linked to medication therapy cessation and the impact of medication cessation after myocardial infarction. The study of 1521 patients found that discontinuation of their medication early after discharge from the hospital was associated with higher mortality risk than those who continued taking medicine. Patients who discontinued all medicines at one month had lower one-year survival than those who continued.

In 2010, Dragomir et al. estimated the impact of low adherence to antihypertensive drugs on cardiovascular outcomes and the cost of hospitalization in a cohort study of 59,647 patients with essential hypertension. Poor adherence to antihypertensive drugs was related significantly to a higher risk of vascular events, hospitalization and higher cost of medical treatments, according to the findings, by increasing the level of adherence; we can provide a better health status and net financial gain.

In 2014, Al Ameri et al. (2014) performed a study for 237 elderly patients in a tertiary hospital in the United Arab Emirates to see whether there was a correlation between polypharmacy and factors such as age, gender, level of education, number of medications, and comorbidities. The results revealed a clear relationship between these factors and polypharmacy, in which co-morbidities and drug interaction increase with increasing medications taken by patients. Male subjects were more frequently exposed to polypharmacy and had more significant co-morbidities than women.

Consequently, educational programmes targeting healthcare providers and patients must be developed in the hospital settings.

Another study was conducted by Demain et al. (2015), who identified treatment disruptions experienced by patients with chronic disease and treatment and tried to put strategies in place to minimize these treatment-generated disruptions. Data were collected from 294 patients. Primary results show that treatment generates adverse physical and emotional side effects; patients try to reduce these disruptions by non-adherence or additional adaptive work, which has a huge impact on physical outcome and care relationships. Clinicians must communicate with patients by having an honest and constructive discussion about therapy disruptions and the ability to follow prescribed regimens by putting plans that result in optimizing outcomes and minimizing disruptions.

In 2010 van Mourik et al. performed a global study to check the availability, price and affordability of cardiovascular medications in some developing countries, using the standardized data which were collected according to the WHO/Health Action International methodology. Data were analysed from 36 countries, which include the following medicines: atenolol, captopril, hydrochlorothiazide, nifedipine and losartan. The outcome measures were percentage availability, price ratios to the international reference price. Results show that cardiovascular medicines' overall availability was poor; patients' prices were higher than international reference prices. Also, chronic treatment with antihypertensive medicine

costs more than payments in many countries; also, when single therapy is inadequate, therapy becomes unaffordable. This confirms the need for concerted attention and financing to make medicines for chronic disease accessible, so various policy options should be recommended to reach this goal.

A retrospective cohort observation of patients made by Sokol et al. (Sokol et al., 2005) assessed the impact of medication adherence on healthcare utilization and cost for four chronic diseases: diabetes mellitus; hypercholesterolaemia; essential hypertension; and congestive cardiac failure. Results explained that for hypercholesterolaemia and diabetes, since high drug adherence was linked to lower disease-related healthcare costs, higher treatment costs were more than offset by lower medical costs, resulting in a significant reduction in overall healthcare costs. For hypertension, dyslipidaemia and diabetes, cost offsets were noticed for all-cause medical costs at high medication adherence degrees. An increase in medication adherence linked with lower hospitalization rates was observed in four diseases, so increasing drug utilization provides a net financial return driven via a higher rate of adherence to treatment with guidelines-based therapy.

A retrospective database study performed by Lynch et al. (2009) determined the adherence to antihypertensive medication and its association with decreased medical and drug costs, work absence days, and medical service utilization among employees with hypertension. Results

proved that adherence to antihypertensive medication was correlated with improvements in short-term utilization measures, healthcare costs, emergency service utilization, and work absence days among high prior-cost employees, but not among low prior-cost employees.

In 1995, a cross-sectional study was performed by Lin et al. (2007) to measure the medication adherence rate and investigate its associated factor among patients in Tainan who were diagnosed with hypertension. The results showed that drug adherence among elderly using antihypertensive medication was 57.6%, and that many factors aided in better adherence, such as decreased daily dose frequency, trust in the efficacy of antihypertensive medication, health examination, low incidence of adverse drug effects, and more explanation from physicians about adverse drug reactions. To improve adherence, doctors should prescribe long-acting medications, confirm the medications' efficacy and reduce the probability of adverse effect occurrence.

A recent cross-sectional study was conducted by Krska et al., (2019) in south-east England, which measured the complexity of the regimen and specified how burden is influenced. In a total of 492 patients who completed the Living with Medicines Questionnaire (LMQ), complexity was correlated firmly with the number of medications, the number of therapeutic classes and the number of formulations. The highest complexity scores were observed for patients using medications for eyes, respiratory disease, and skin. By increasing the frequency of dosing, the

number of medicines, number of different therapeutics groups all increased the medication burden. Sixty per cent of patients used cardiovascular medicine, but a high burden is linked more to neurological, psychiatric and gastrointestinal conditions.

Another recent study performed by Tordoff et al. (2019b), using the Living with Medicines Questionnaire (LMQ), identified any subpopulations with a huge medicine burden among 472 New Zealand adults from a community pharmacies' using more than one medicine for at least three months. From the LMQ scores it appears that 30.5% had a high burden. Elevated scores were connected with unemployed. Patients use at least five medicines, using medicines at least three times a day, aged 18–29 years;. Therefore these patients should be the objective of interventions aimed at reducing drug burden.

Zolnieriek and DiMatteo, (2009) did a meta-analysis that estimated the relationship between doctor communication and patient adherence, which proves that physician communication is positively associated with patients' adherence, so training doctors in communication skills will generate essential improvements in patients' medication adherence. Communication in healthcare centres is strongly correlated with better patient adherence.

A survey was performed by Roshan et al. (2010) on 313 CVD patients to inspect whether different types of prognostic information connected with the prescription of a specific drug by doctors can impact patients to use the medicine as recommended and to check whether patients need this type of

information. The highest self-estimated probability of not taking the medication was seen when the cardiologist prescribed the drug without explaining the absolute and risk-lowering figure. Most patients (85%) wanted to get information about the cardiovascular risk reduction linked with cardiovascular medication.

Van der Wal et al. (2010) performed a qualitative descriptive study to identify reasons for compliance, hindrances to compliance, and the intervention that may help heart failure patients. Primary reasons that improve adherence were fear of hospitalization and the annoying symptoms of heart failure, while negative aspects and misunderstandings of a regimen were the hindrances for compliance. So healthcare professionals need to confirm the advantages of compliance, encourage patients to adhere, and concentrate on individual hindrance to compliance, knowledge shortage, and misunderstanding regarding the regimen, and give more accurate information about the need for a healthy diet.

A randomized controlled trial conducted by Murray et al. (2007) determined whether pharmacist intervention leads to efficient drug adherence and a positive health effect for heart failure patients. The authors showed that pharmacist intervention for outpatients with HF disease can significantly enhance adherence to cardiovascular drugs, decreasing healthcare utilization and costs. Constant pharmacist interventions are the cornerstone because it appears that the effect dissipates when the intervention ceases.



A retrospective longitudinal cohort study conducted by Fitzgerald et al. (2011) assessed the relationship between adherence (with angiotensin II receptor blockers (ARBs) angiotensin-converting enzyme inhibitors (ACEIs), aldosterone antagonists, beta-blockers (B-blockers) and primary results of all-cause mortality and cardiovascular hospitalizations for 557 patients with HF for a period of follow-up of 1.1 years. This study clarified a strong relationship between non-adherence and increased risk of all-cause hospitalization and mortality for heart failure populations, so systems of care are required to optimize adherence for heart failure patients.

Another study in Palestine conducted by Jamous et al., (2014) on 187 patients investigated medicine adherence and beliefs about medications and whether beliefs affect medication adherence. This study was carried out in Nablus, Palestine at a primary healthcare clinic of the Palestinian Medical Military Services, using the beliefs about medicines questionnaire to estimate beliefs and the Morisky medication adherence scale to evaluate adherence. The study clarified that 79.6% of patients agreed that their medications were essential, 58.2% were worried about taking medications on a regular basis, and 57.8% were worried about becoming dependent on their medications. The study also explained that patients with a higher level of beliefs about medications had higher adherence, however patients who had higher worried beliefs had lower adherence. So beliefs about medicines are a significant element in improving adherence.

### **1.3 Statement of the Problem and Rationale of the Study**

Multiple long-term cardiovascular medicine use can affect the different aspects of patients' daily lives (van der Laan et al., 2018). In addition, the medication burden has an apparent adverse effect on patients' lives and is linked with adverse drug events (Zidan et al., 2016). Adverse drug reactions (ADRs) have considerable economic and clinical costs as they often lead to hospital admission, prolongation of hospital stay, and emergency department visits (Sultana et al., 2013). Furthermore, the burden and complexity of multiple medication use are associated with worse patient outcomes, including reduced adherence and increased costs, hospitalizations, mortality rates (Boye et al., 2020).

So treatment burden can negatively impact on quality of life and adherence to treatments. Moreover, patients' beliefs about medicines are probably affected by their own experiences, which can affect their adherence to using medications, so poor adherence could compromise their health and life (Tordoff et al., 2019a). Few studies have been performed to evaluate cardiovascular medications' impact on patients' lives and quality of life. No research has been conducted in Palestine focusing on these issues using the LMQ scale, which is considered an instrument that quantifies medicine burden, which helps us recognize specific burden challenges that may need to be addressed, resulting in prevention or/and reduction of medicine burden.

This study may optimize cardiovascular medication use by quantifying patients' thoughts, feelings, and experiences using long-term medicine, and resolving drug-related problems. This can improve clinical outcomes, decrease mortality and morbidity, decrease hospitalization, the demand for nursing home care and lower healthcare costs (Demain et al., 2015). The results of this study can help us design interventions to minimize medication burden, assist patients in gaining better use of their medicine, and improve medication adherence and health system costs.

#### **1.4 The Objectives of the Study**

##### **1.4.1 General objective**

The main objective of the current study was to assess the impact of chronic cardiovascular medication use on patients' daily lives.

##### **1.4.2 Specific objectives**

- To quantify the medicine burden among cardiovascular patients by using LMQ-3.
- To assess the effect of chronic cardiovascular medication use on different aspects of patients' daily lives.
- To examine the relationship between demographic and clinical characteristics of the patients' daily life score.

## **1.5 Significance of the Study**

This is the first study in Palestine to measure cardiovascular medications' impact on patients' lives by using the LMQ. The study measured the burden of using these medications, which may improve patient quality of life by making an endeavour to reduce the medication-related burden on patients. Furthermore, collecting information about cardiovascular patients' experience using their medicine will give in-depth a knowledge for healthcare providers about this impact, which encourages them to make a significant effort to decrease patients' medication-related burden by facilitating a combination of long-term medication use in the daily lives of patients.

In addition, this study provides us with appropriate information about the most prominent factors that are influencing medication-related burden that should be taken into consideration when starting to design tailored interventions to minimize this burden, which result in improving patients' outcome and quality of life, increase medication effectiveness, decrease mortality and morbidity, decrease hospitalization, demand for nursing home care and reduce healthcare costs.

## **Chapter Two**

### **Methodology**

#### **2.1 Study Design and Settings**

A cross-sectional study design was used to address the research goals in community pharmacies. Participants were recruited from many pharmacies in the capital city Jerusalem. These pharmacies were private pharmacy or pharmacies in clinic. Recruitment took place over several visits, lasting around three hours each, via face-to-face appointment, between January 2019 and October 2019. In agreement with the pharmacist, approached customers after they had dispensed a prescription or made a purchase. I introduced myself by name, the University I'm studying at. I explained to them the Questionnaire Objectives, and asked if they agree to participate, People who agreed included in this study. Participants were patients who used cardiovascular medication in Jerusalem, Palestine.

#### **2.2 Sample Size**

The population was chosen from public pharmacies in Jerusalem. The approximated sample size that was obtained was 380 patients. Since the exact number of patients with cardiovascular medications in the study setting is unknown, it is assumed that the population is less than 20,000 patients. This number was used to calculate the sample size needed in this study. By considering a response distribution to be 50% and allowing a 5% margin of error at a 95% confidence interval, the study's required sample size was determined using the Raosoft sample size calculator

(<http://www.raosoft.com/samplesize.html>). The minimum adequate sample size was 377. In addition, to minimize erroneous results and increase the study's reliability, the target sample size was increased by 5% to 10%. Furthermore, a pilot study of 10 - 20 patients was done before beginning the actual study.

## **2.3 Data Collection**

Data were collected by a pharmacist in community pharmacies familiar with the pharmacies' work system. Data were collected from January to October 2019.

### **2.3.1 Tools used in data collection**

The data collection form (Appendix 1) that was used in this study consists of four parts:

1. Patient's demographic information: age, gender, locality (urban, rural, camp), health insurance.
2. Clinical information about disease history and comorbidities, including the presence of comorbidities and the name of medications used.
3. Medication information's: name of medications used, Medications-Related Characteristics, number of medicines used, formulation used, and medication frequency.
4. LMQ-3 scale (Arabic version used): a multi-item survey tool, was developed in the UK, specifically to explore people's medicine burden.

It has been validated, refined and revised, and is now known as LMQ-3 and has been translated into many languages. This questionnaire contains 41 statements positively or negatively worded on a 5-point Likert-type scale (strongly agree to strongly disagree), reverse scoring used for negatively worded questions, so that higher scores indicate a higher burden/worse experience of medicine utilization. So the degree of medication-related burden (MRB) is classified based on the LMQ overall score: (41–73) no burden at all; (74–106) minimum burden; (107–139) moderate burden; (140–172) high burden; (173–205) extremely high burden.

5. Based on data from cardiovascular patients. The LMQ-3 also consists of a visual analogue scale (VAS), that allowed the patient to express his or her overall perceived medication burden, a scale from 1–10 that measures global burden, with anchors indicating (no burden at all, to extremely burdensome. LMQ total scores were compared to scores from the VAS, “Overall, how much of a burden do you feel your medicines are to you, by measuring the mean of VAS, and notice if there is a positive correlation between LMQ total scores and VAS burden scores. And an optional free-text question. (Tordoff et al., 2019a, Zidan et al., 2018b).

Subscale/domain score was the summation of item scores per domain, which are related to interferences with day-to-day life, side effects, general concerns about medicines, practical difficulties, lack of effectiveness, patient-physician relationship/ communication issues, cost-related burden,

and absence of autonomy /control over medicines' use as represented in Appendix 2. Thus the LMQ-3 total score is the summation of all subscale scores (Krska et al., 2017a).

In this study, we use LMQ-3 to measure the treatment burden among patients with cardiovascular disease. This questionnaire is a reliable, valid instrument, has an acceptable construct, criterion-related and known-groups validity, and is internally consistent as a measure of medicine burden. A culturally suitable translation of the LMQ was generated for potential research and clinical practice in Arabic-speaking countries. Further validation of the developed Arabic version is recommended and required. This Questionnaire covers practical difficulties, general concerns about medication, patient–health professionals communication and relationships about medicines, interference with everyday life, lack of effectiveness, cost-related burden, shortage of autonomy/control of medicine use, and side effects. The LMQ-3 has a 5-point rating scale to measure the extent of agreement with each statement, in addition to a free-text box to enable patients to add any further issues not covered by the questionnaire or to explain their responses (Zidan et al., 2016). Permission to use this instrument was obtained from both the original developer of the scale and the group that translated it to the Arabic language (Katusiime et al., 2018).



## **2.4 Inclusion and Exclusion Criteria**

### **2.4.1 Inclusion criteria**

1. Residents aged 18 years and above.
2. Patients have cardiovascular disease and using cardiovascular medication.
3. Patients who agreed to participate.

### **2.4.2 Exclusion criteria**

1. Patients were unable to understand the questions.
2. Patients have cancer or are receiving chemotherapy.

## **2.5 Statistical Data Analysis**

All data were analysed using the Statistical Package for Social Sciences (SPSS) (SPSS Inc., Chicago, IL, USA) program version 16. The descriptive analysis presented the normally distributed continuous variables as means  $\pm$  standard deviations (SD), the not normally distributed continuous variables as medians (lower-upper quartiles), and the categorical variables as frequencies and percentages. Kolmogorov–Smirnov test was used to assess data normality. Differences in score results were evaluated using the t-test for continuous variables (normally distributed). The Mann–Whitney U test or Kruskal–Wallis was performed appropriately for not normally distributed ones. Either the chi-square or the Fisher exact test was used, as

appropriate, to test the significance between categorical variables. The level of significance was determined at  $P < 0.05$ . Also, scores of LMQ-3 were calculated from the responses to the statements of the questionnaire, using reversed scoring as required. The scores were then categorized into a low, moderate, or high burden (Katusiime et al., 2018).

## **2.6 Ethical Approval**

Before the start of the research, approval of Institutional Review Board (IRB) (Appendix 3--), and agreement of Faculty of Graduate Studies at An-Najah National University were received to ascertain patients' rights, and facilitate the research progression. Only patients who agreed to participate were included in the study after discussing the research objectives and protocols with each one and obtaining a verbal agreement.

## Chapter Three

### Results

#### 3.1 Sociodemographic Characteristics of the Study Patients

A total number of 380 patients with cardiovascular diseases were included in this study. The data were collected from the community pharmacies in Jerusalem, Palestine. Table 3.1 shows the socio-demographic characteristics of the patients. The mean age ( $\pm$ SD) of patients was  $58 \pm 12.2$  years, ranging from 20 to 85 years; 53% were between 30 and 60 years, and 46% were above 60 years old. In addition, 195 (51.3%) patients were females, and 185 (48.7) were males giving a female:male ratio of 1.05:1. The majority of patients, 227 (59.7%) were living in urban areas, 125 (32.9%) and 28 (7.4%) patients were living in rural and camp areas, respectively. The majority of patients have health insurance (292, (76.8%)).

**Table 3.1: Socio-demographic characteristics of the study patients (N=380).**

Characteristic	Total (n=380)
<b>Age (years)</b>	
Mean $\pm$ SD	$58 \pm 12.2$
Range	20-85
<b>Age category (years)</b>	
<60	205 (53.9)
>60	175 (46.1)
<b>Gender, n%</b>	
Male	185(48.7)
Female	195 (51.3)
<b>Locality, n%</b>	
Urban	227 (59.7)
Rural	125 (32.9)
Refugee camp	28 (7.4)
<b>Insurance, n%</b>	
Yes	292 (76.8)
No	88 (23.2)

### 3.2 Cardiovascular Diseases and Other Comorbidities among the Patients of the Study

The study patients had a mean  $\pm$  SD of  $2.68 \pm 1.17$  and median (interquartile range) of 3 (2–3) illnesses with a maximum of 8.

Regarding cardiovascular diseases, 259 (68.2%) of patients had hypertension, followed by 102 (26.8%) with ischaemic heart diseases, 64 (16.8%) with heart failure, and 12 (3.2%) with atrial fibrillation (Table 3.2).

Regarding other co-morbid diseases, Table 3.2 shows that the majority of patients suffered from diabetes mellitus (n=178, 46.8%), followed by dyslipidaemia (n=158, 41.6%).

**Table 3.2: Chronic diseases among the study sample.**

Chronic disease	Total (n=380) Frequency (%)
Hypertension	259 (68.2)
Diabetes mellitus	178 (46.8)
Dyslipidaemia	158 (41.6)
Ischaemic heart diseases	102 (26.8)
Peptic ulcer	88 (23.2)
Heart failure	64 (16.8)
Hypoparathyroidism	32 (8.4)
Anaemia	17 (4.5)
Arterial fibrillation	12 (3.2)
Vit. D deficiency	10 (2.6)
Osteoporosis	9 (2.4)
Stroke	8 (2.1)
Neuropathic pain	7 (1.8)
Gout	4 (1.1)
Rheumatoid arthritis	4 (1.1)
Renal failure	3 (0.8)
Urinary stone	3 (0.8)
Depression	3 (0.8)
Glaucoma	3 (0.8)
Allergic rhinitis	3 (0.8)
Insomnia	3 (0.8)
Benign prostatic hyperplasia	3 (0.8)
Asthma	3 (0.8)

### 3.3 Chronic Medications Used by the Study Sample

Regarding medications used, the number of medications used among patients ranged from 1–13, with a mean ( $\pm$ SD) of  $4 \pm 1.71$  and median (interquartile range) of 4 (3–5).

As shown in Table 3.3, according to patients' medications; aspirin (n=181, 47.6%), atorvastatin (n=134, 35.5%), metformin (n=104, 27.4%) and bisoprolol (n=90, 23.7%) were the most commonly used medications.

**Table 3.3: The most commonly prescribed medications.**

Medication Name	Total (n=380) Frequency (%)
Aspirin	181 (47.6)
Atorvastatin	134 (35.5)
Metformin	104 (27.4)
Bisoprolol	90 (23.7)
Ramipril	83 (21.8)
Clopidoxcel	80 (21.1)
Amiodarone	19 (5)
Furosemide	44 (11.6)
Omeprazole	42 (11.1)
Enalapril	41 (10.8)
Insulin	41 (10.8)
Valsartan/ Hydrochlorothiazide	40 (10.5)
Amlodipine	37 (9.7)
Atenolol	36 (9.5)
Levothyroxine	32 (8.4)
Glimepiride	30 (7.9)
Losartan	22 (5.8)
Rosuvastatin	22 (5.8)
Sitagliptin/Metformin	22 (5.8)
Simvastatin	21 (5.5)
Esomeprazole	20 (5.3)
Valsartan/Amlodipine	20 (5.3)
Calcium+vitD	16 (4.2)
Spironolactone	16 (4.2)
Lercadipine	15 (3.9)
Metoprolol	14 (3.7)
Iron	13 (3.4)
Vitamin B12	13 (3.4)
Pregabalin	12 (3.2)
Empagliflozin	11 (2.9)

Lansoprazole	11 (2.9)
Liraglutide	11 (2.9)
Vitamin D	10 (2.6)
Metformin/Pioglitazone	9 (2.3)
Bezafibrate	8 (2.1)
Nitrate	8 (2.1)
Prasugrel	8 (2.1)
Ramipril/Hydrochlorothiazide	8 (2.1)
Apixaban	7 (1.8)
Glibenclamide	7 (8.1)
Propranolol	7 (1.8)
Ranitidine	7 (1.8)
Vidoglipatin	7 (1.8)
Candesartan/Hydrochlorothiazide	6 (1.6)
Empagliflozin/Metformin	6 (1.6)
Nifedipine	6 (1.6)
Digoxin	5 (1.3)
Doxazocin	5 (1.3)
Metformin/Pioglitazone	5 (1.3)
Dulaglutide	5 (1.3)
Allopuranol	4 (1.1)
Alfacalcidol	4 (1.1)
Dapagliflozin/Metformin	4 (1.1)
Hydrochlorothiazide	4 (1.1)
Pantoprazole	4 (1.1)
Rivaroxaban	4 (1.1)
Warfarin	4 (1.1)
Amitriptyline	4 (1.1)
Alendronate	3 (0.8)
Dabigatran	3 (0.8)
Pravastatin	3 (0.8)
Prednisolone	3 (0.8)
Tamsulosin	3 (0.8)
Brotiazolam	2 (0.5)
Carvedilol	2 (0.5)
Escitalopram	2 (0.5)
Losartan/Hydrochlorothiazide	2 (0.5)
Propylthiouracil	2 (0.5)
Acetazolamide	1 (0.3)
Cilazapril/Hydrochlorothiazide	1 (0.3)
Colchicine	1 (0.3)
Duloxetine	1 (0.3)
Dutasteride	1 (0.3)
Famotidine	1 (0.3)
Fexofenadine	1 (0.3)
Fingolimod	1 (0.3)
Flecainide	1 (0.3)
Gabapentin	1 (0.3)
Ivabradine	1 (0.3)
Hydroxycarbamide	1 (0.3)
Letrozole	1 (0.3)
Lorazepam	1 (0.3)

Methotrexate	1 (0.3)
Oxcarbazepine	1 (0.3)
Potassium Chloride	1 (0.3)
Repaglinide	1 (0.3)
Risedronate	1 (0.3)
Saxagliptin	1 (0.3)
Sitagliptin	1 (0.3)
Sulfasalazine	1 (0.3)
Terazosin	1 (0.3)
Teriflunomide	1 (0.3)
Ticagrelor	1 (0.3)
Verapamil	1 (0.3)
Citalopram	1 (0.3)
Diazepam	1 (0.3)

### 3.4 Medications-Related Characteristics

Two hundred and fifty-one patients (66.1%) used 1–4 medicines, and 122 (32.1%) patients used 5–9 medicines. On the other hand, nearly all patients used formulations that are oral solid formulations, with 314 (82.6%) using tablets or capsules, while 17.4% of patients used tablets or capsules with other formulations. More than half of the patients reported using medicines once daily, and 34% reported using them twice daily (Table 3.4).

**Table 3.4: Medication-related characteristics.**

Medication-related characteristics	Total (n=380) Frequency (%)
Number of medicines	
1–4	251 (66.1%)
5–9	122 (32.1%)
10 or more	7 (1.8%)
Formulation used	
Tablet/capsule	314 (82.6%)
Tablet/capsule with other formulation	66 (17.4%)
Medication Frequency	
Once daily	200 (52.6%)
Twice daily	131 (34.5%)
Three times daily	39 (10.3%)
More than three times daily	1 (0.3%)
Other times*	9 (2.4%)

\* Includes medications used when needed (prn), different days of the week, every two weeks, once a month, weekly, every three months, or every half-year.

### **3.5 Assessment of Medication-Related Burden Using LMQ-3**

Concerning communication/relationships with healthcare providers about medications, 299 (78.6%) of respondents trusted their physicians' judgement in choosing their medication. About three-quarters of participants 294 (77.4%) judged that physician listen to their personal opinions, 306 (85%) take their worries about side effects seriously, 297 (78.2%) explained that they get enough information about medications from their physician and that healthcare providers know enough about them and their medications 289 (76.1%), (Tables 3.5 ,3.6 ,3.7). In this domain, remarkably higher scores indicated poorer quality relationships among female participants (P-value 0.046), urban locality (P-value 0.00), without health insurance (P-value 0.015). (Table 3.8)

Over 60% of participants did not find it a struggle to receive prescriptions from their physicians or medicines from pharmacists. Eighty-three percent (317) feel that the times for taking their medicines are appropriate, 276 (72.6%) were worried about forgetting to take their medications, and it is easy for them to keep to their medication schedule 289 (76%), (Tables 3.5, 3.6, 3.7). Putting a lot of thought and planning into using medications is seen only in 109 (30%) of participants, and 99 (26%) feel that using their medicines is hard. Remarkable higher scores, indicating more practical difficulties, were found among patients without health insurance ( P-value 0.003). (Table 3.8)



The price of prescribed medications was troublesome for approximately half of the respondents (Tables 3.5, 3.6, 3.7). Significant high scores indicating a greater price-related burden were found in patients suffering from one disease (P-value 0.031). (Table 3.8).

Concerning the side effects, 218 (57.4%) of participants strongly agree/agreed that side effects were much worse than the disease for which they were taking medications and 275 (72.4%) of respondents feel that the side effects of medications intervene in their daily lives (Tables 3.5, 3.6, 3.7). Significant higher scores indicating greater side effect-related burdens were found in participants' who had one or two diseases (P-value 0.02). (Table 3.8).

With regard to the perceived effectiveness of medicines, 301 (79.3%) of participants felt that their medications are actually working, 294 (77.4%) live up to their expectations, 313 (82.4%) agree that medicines prevent their conditions from getting worse, about four-fifths of respondents reported the advantages and expressed satisfaction (Tables 3.5, 3.6, 3.7).

The assessment of attitudes/ concerns about medicines finds that 300 (79%) of participants felt they require more information about their medications, 221 (58.2%) were worried about long-term effects of using medications, potential drug–drug interactions 273 (71.8%), and potential drug–beverage interaction 234 (61.6%). Three-quarters of them were worried about using several medicines at the same time, and 209 (55%) were worried about being too dependent on their medications. Two-thirds of participants would

prefer to have more say in the brands of medications used (Tables 3.5, 3.6, 3.7).

In terms of the impact/ interference of medications with daily life, 251 (66.1%) of respondents referred that their lives revolved around using their medications, approximately half of respondents see that their medications intervene with leisure or social activities, 198 (52.1%) feel that taking medicines affects their driving, and 269 (70.8%) that their medicines did not interfere with their social relationships. Half of the respondents see that taking medicines causes problems with daily tasks; 242 (63.7%) deny medicines' interference with their sexual life (Table 3.5, 3.6, 3.7). Significantly higher scores elucidating greater interference with daily life were observed among patients with one disease (P-value 0.013) and those were using 1–4 medicines (P-value 0.008). (Table 3.8)

Over half of the patients reported minimal empowerment to change their medication regimens to accommodate their lifestyles, according to an evaluation of their control/autonomy over their medication regimens; 95(25%) felt they could change their medicine dose, 172 (45.3%) thought they had the option of using or not using their medications. In contrast, one-third felt they could change the administration times (Tables 3.5, 3.6, 3.7). Patients who used tablets/capsules with other formulations had significantly higher scores (P-value 0.027), and those who uses 1-4 medicine or 5-9 medicine (P-value 0.006) suggesting a lack of control (Table 3.8).

Gender, locality and formulation affected one domain; health insurance and medication number affected two domains; the number of diseases affected three domains. (Table 3.8)

**Table 3.5: Patients' response to Living with Medicines Questionnaire (LMQ-3) n=380.**

Question	Total (n = 380) n (%)
1- I find getting my prescriptions from the physician hard Strongly Agree Agree Neutral Disagree Strongly Disagree	42 (11.1) 84 (22.1) 24 (6.3) 173 (45.5) 57 (15)
2- I find getting my medications from the pharmacist hard Strongly Agree Agree Neutral Disagree Strongly Disagree	34 (8.9) 72 (18.9) 17 (4.5) 193 (50.8) 64 (16.8)
3- I am delighted with the effectiveness of the medications Strongly Agree Agree Neutral Disagree Strongly Disagree	87 (22.9) 223 (58.7) 17 (4.5) 50 (13.2) 3 (8)
4- I am satisfied with the times I should take my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	115 (30.3) 202 (53.2) 15 (3.9) 40 (10.5) 8 (2.1)
5- I am concerned about paying for my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	69 (18.2) 97 (25.5) 24 (6.3) 157 (41.3) 33 (8.7)
6- I am concerned that I have to take several medications at the same time Strongly Agree Agree Neutral Disagree Strongly Disagree	90 (23.7) 188 (49.5) 22 (5.8) 62 (16.3) 18 (4.7)
7- I trust the decision of my physician(s) in choosing medications for me Strongly Agree Agree	126 (33.2) 173 (45.5)

Neutral	29 (7.6)
Disagree	44 (11.6)
Strongly Disagree	8 (2.1)
8- I would like more say in the brands of medications I utilize	
Strongly Agree	79 (20.8)
Agree	175 (46.1)
Neutral	32 (8.4)
Disagree	79 (20.8)
Strongly Disagree	15 (3.9)
9- I feel I need more information about my medications	
Strongly Agree	138 (36.3)
Agree	162 (42.6)
Neutral	19 (5)
Disagree	51 (13.4)
Strongly Disagree	10 (2.6)
10- I am worried that I may forget to take my medications	
Strongly Agree	81 (21.3)
Agree	195 (51.3)
Neutral	26 (6.8)
Disagree	69 (18.2)
Strongly Disagree	9 (2.4)
11- I can change the dose of the medications I take	
Strongly Agree	31 (8.2)
Agree	64 (16.8)
Neutral	20 (5.3)
Disagree	201 (52.9)
Strongly Disagree	64 (16.8)
12- I am worried about possible damaging long-term effects of taking medications	
Strongly Agree	83 (21.8)
Agree	138 (36.3)
Neutral	30 (7.9)
Disagree	108 (28.4)
Strongly Disagree	21 (5.5)
13- I can decide whether or not to take my medications	
Strongly Agree	51 (13.4)
Agree	121 (31.8)
Neutral	16 (4.2)
Disagree	119 (31.3)
Strongly Disagree	73 (19.2)
14- My physician(s) listen to my opinions about my medications	
Strongly Agree	71 (18.7)
Agree	223 (58.7)
Neutral	29 (7.6)
Disagree	46 (12.1)
Strongly Disagree	11 (2.9)
15- My medications prevent my condition from getting worse	
Strongly Agree	80 (21.1)
Agree	233 (61.3)
Neutral	17 (4.5)
Disagree	37 (9.7)
Strongly Disagree	13 (3.4)

16- I am worried that I am too dependent on my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	76 (20) 133 (35) 27 (7.1) 110 (28.9) 34 (8.9)
17- I am worried that my medications interact with foods, alcohol Strongly Agree Agree Neutral Disagree Strongly Disagree	87 (22.9) 147 (38.7) 22 (5.8) 104 (27.4) 20 (5.3)
18- I am concerned that my medicines may interact with each other Strongly Agree Agree Neutral Disagree Strongly Disagree	92 (24.2) 181 (47.6) 23 (6.1) 77 (20.3) 7 (1.8)
19- My medications interfere with my social or leisure activities Strongly Agree Agree Neutral Disagree Strongly Disagree	88 (23.2) 93 (24.5) 16 (4.2) 148 (38.9) 35 (9.2)
20- My physician takes my worries about side effects seriously Strongly Agree Agree Neutral Disagree Strongly Disagree	127 (33.4) 179 (47.1) 25 (6.6) 45 (11.8) 4 (1.1)
21- The side effects I get are sometimes worse than the disease for which I take medications Strongly Agree Agree Neutral Disagree Strongly Disagree	70 (18.4) 148 (38.9) 20 (5.3) 117 (30.8) 25 (6.6)
22- The side effects I get from my medications interfere with my daily life (e.g., work, housework, sleep) Strongly Agree Agree Neutral Disagree Strongly Disagree	87 (22.9) 188 (49.5) 13 (3.4) 86 (22.6) 6 (1.6)
23- I have to put a lot of planning and thought into taking my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	33 (8.7) 76 (20) 26 (6.8) 182 (47.9) 63 (16.6)

24- I get enough information about my medications from my physician(s) Strongly Agree Agree Neutral Disagree Strongly Disagree	 124 (32.6) 173 (45.5) 25 (6.6) 48 (12.6) 10 (2.6)
25- My medications live up to my expectations Strongly Agree Agree Neutral Disagree Strongly Disagree	 101 (26.6) 200 (52.6) 32 (8.4) 43 (11.3) 4 (1.1)
26- I can change the times I take my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	 31 (8.2) 107 (28.2) 17 (4.5) 168 (44.2) 57 (15)
27- It is easy to keep to my medications routine Strongly Agree Agree Neutral Disagree Strongly Disagree	 99 (26.1) 190 (50) 20 (5.3) 54 (14.2) 17 (4.5)
28- Taking medications affects my driving abilities Strongly Agree Agree Neutral Disagree Strongly Disagree	 50 (13.2) 148 (38.9) 37 (9.7) 108 (28.4) 37 (9.7)
29- I find using my medications difficult Strongly Agree Agree Neutral Disagree Strongly Disagree	 27 (7.1) 72 (18.9) 18 (4.7) 179 (47.1) 84 (22.1)
30- The side effects I get from my medications are annoying Strongly Agree Agree Neutral Disagree Strongly Disagree	 79 (20.8) 124 (32.6) 23 (6.1) 123 (32.4) 31 (8.2)
31- I sometimes have to decide between buying basic essentials or medications Strongly Agree Agree Neutral Disagree Strongly Disagree	 84 (22.1) 153 (40.3) 25 (6.6) 86 (22.6) 32 (8.4)

32- My medications allow me to live my life as I want to Strongly Agree Agree Neutral Disagree Strongly Disagree	83 (21.8) 211 (55.5) 17 (4.5) 50 (13.2) 19 (5)
33- I have to pay more for my drugs than I can afford Strongly Agree Agree Neutral Disagree Strongly Disagree	69 (18.2) 85 (22.4) 22 (5.8) 171 (45) 33 (8.7)
34- The healthcare professionals providing my care know enough about me and my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	108 (28.4) 181 (47.6) 25 (6.6) 57 (15) 9 (2.4)
35- My medications interfere with my social relationships Strongly Agree Agree Neutral Disagree Strongly Disagree	22 (5.8) 69 (18.2) 20 (5.3) 200 (52.6) 69 (18.2)
36- Taking medications makes it difficult for me to complete daily activities (such as work, housework, hobbies) Strongly Agree Agree Neutral Disagree Strongly Disagree	68 (17.9) 125 (32.9) 16 (4.2) 146 (38.4) 25 (6.6)
37- My medications have a negative impact on my sexual life Strongly Agree Agree Neutral Disagree Strongly Disagree	15 (3.9) 64 (16.8) 59 (15.5) 165 (43.4) 77 (20.3)
38- My drugs' side effects have a negative impact on my health Strongly Agree Agree Neutral Disagree Strongly Disagree	25 (6.6) 99 (26.1) 26 (6.8) 183 (48.2) 47 (12.4)
39- My medications are working Strongly Agree Agree Neutral Disagree Strongly Disagree	94 (24.7) 207 (54.5) 26 (6.8) 42 (11.1) 11 (2.9)
40- The side effects are worth it for the benefits I get from my medications Strongly Agree Agree	106 (27.9) 192 (50.5)

Neutral	30 (7.9)
Disagree	47 (12.4)
Strongly Disagree	5 (1.3)
41- My life revolves around using my medications	
Strongly Agree	76 (20)
Agree	175 (46.1)
Neutral	26 (6.8)
Disagree	79 (20.8)
Strongly Disagree	24 (6.3)

**Table 3.6: Response to LMQ arranged according to the eight domains.**

<b>Relationships Domain Questions</b>	
I trust the decision of my physician(s) in choosing medications for me	
Strongly Agree	126 (33.2)
Agree	173 (45.5)
Neutral	29 (7.6)
Disagree	44 (11.6)
Strongly Disagree	8 (2.1)
My physician(s) listens to my opinions about my medicines	
Strongly Agree	71 (18.7)
Agree	223 (58.7)
Neutral	29 (7.6)
Disagree	46 (12.1)
Strongly Disagree	11 (2.9)
My physician takes my concerns about side effects seriously	
Strongly Agree	127 (33.4)
Agree	179 (47.1)
Neutral	25 (6.6)
Disagree	45 (11.8)
Strongly Disagree	4 (1.1)
I get enough information about my medications from my physician(s)	
Strongly Agree	124 (32.6)
Agree	173 (45.5)
Neutral	25 (6.6)
Disagree	48 (12.6)
Strongly Disagree	10 (2.6)
The healthcare professionals providing my care know enough about me and my medications	
Strongly Agree	108 (28.4)
Agree	181 (47.6)
Neutral	25 (6.6)
Disagree	57 (15)
Strongly Disagree	9 (2.4)
<b>Practicalities Domain Questions</b>	
I find getting my prescriptions from the physician hard	
Strongly Agree	42 (11.1)
Agree	84 (22.1)



Neutral	24 (6.3)
Disagree	173 (45.5)
Strongly Disagree	57 (15)
I find getting my medications from the pharmacist hard	
Strongly Agree	34 (8.9)
Agree	72 (18.9)
Neutral	17 (4.5)
Disagree	193 (50.8)
Strongly Disagree	64 (16.8)
I am satisfied with the times I should take my medications	
Strongly Agree	115 (30.3)
Agree	202 (53.2)
Neutral	15 (3.9)
Disagree	40 (10.5)
Strongly Disagree	8 (2.1)
I am worried that I may forget to take my medications	
Strongly Agree	81 (21.3)
Agree	195 (51.3)
Neutral	26 (6.8)
Disagree	69 (18.2)
Strongly Disagree	9 (2.4)
I have to put a lot of planning and thought into taking my medications	
Strongly Agree	33 (8.7)
Agree	76 (20)
Neutral	26 (6.8)
Disagree	182 (47.9)
Strongly Disagree	63 (16.6)
It is easy to keep to my medications routine	
Strongly Agree	99 (26.1)
Agree	190 (50)
Neutral	20 (5.3)
Disagree	54 (14.2)
Strongly Disagree	17 (4.5)
I find using my medications hard	
Strongly Agree	27 (7.1)
Agree	72 (18.9)
Neutral	18 (4.7)
Disagree	179 (47.1)
Strongly Disagree	84 (22.1)
<b>Cost Domain Questions</b>	
I am concerned about paying for my medications	
Strongly Agree	69 (18.2)
Agree	97 (25.5)
Neutral	24 (6.3)
Disagree	157 (41.3)
Strongly Disagree	33 (8.7)
I sometimes have to choose between buying basic essentials or medications	
Strongly Agree	84 (22.1)
Agree	153 (40.3)

Neutral	25 (6.6)
Disagree	86 (22.6)
Strongly Disagree	32 (8.4)
I have to pay more for my drugs than I can afford.	
Strongly Agree	69 (18.2)
Agree	85 (22.4)
Neutral	22 (5.8)
Disagree	171 (45)
Strongly Disagree	33 (8.7)
<b>Side effects Domain Questions</b>	
The side effects I get are sometimes worse than the disease for which I take medications	
Strongly Agree	70 (18.4)
Agree	148 (38.9)
Neutral	20 (5.3)
Disagree	117 (30.8)
Strongly Disagree	25 (6.6)
The side effects I get from my medications interfere with my daily life (e.g., work, housework, sleep)	
Strongly Agree	87 (22.9)
Agree	188 (49.5)
Neutral	13 (3.4)
Disagree	86 (22.6)
Strongly Disagree	6 (1.6)
The side effects I get from my medications are annoying	
Strongly Agree	79 (20.8)
Agree	124 (32.6)
Neutral	23 (6.1)
Disagree	123 (32.4)
Strongly Disagree	31 (8.2)
The side effects I get from my medications adversely affect my well-being	
Strongly Agree	25 (6.6)
Agree	99 (26.1)
Neutral	26 (6.8)
Disagree	183 (48.2)
Strongly Disagree	47 (12.4)
<b>Lack of effects Domain Questions</b>	
I am delighted with the effectiveness of the medications.	
Strongly Agree	87 (22.9)
Agree	223 (58.7)
Neutral	17 (4.5)
Disagree	50 (13.2)
Strongly Disagree	3 (8)
My medications prevent my condition from getting worse.	
Strongly Agree	80 (21.1)
Agree	233 (61.3)
Neutral	17 (4.5)
Disagree	37 (9.7)
Strongly Disagree	13 (3.4)

-My medications live up to my expectations. Strongly Agree Agree Neutral Disagree Strongly Disagree	101 (26.6) 200 (52.6) 32 (8.4) 43 (11.3) 4 (1.1)
My medications allow me to live my life as I want to Strongly Agree Agree Neutral Disagree Strongly Disagree	83 (21.8) 211 (55.5) 17 (4.5) 50 (13.2) 19 (5)
-My medications are working. Strongly Agree Agree Neutral Disagree Strongly Disagree	94 (24.7) 207 (54.5) 26 (6.8) 42 (11.1) 11 (2.9)
The side effects are worth it for the benefits I get from my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	106 (27.9) 192 (50.5) 30 (7.9) 47 (12.4) 5 (1.3)
<b>Concerns Domain Questions</b>	
I am concerned that I have to take several medications at the same time Strongly Agree Agree Neutral Disagree Strongly Disagree	90 (23.7) 188 (49.5) 22 (5.8) 62 (16.3) 18 (4.7)
I would like to have more say in the brands of medications I use Strongly Agree Agree Neutral Disagree Strongly Disagree	79 (20.8) 175 (46.1) 32 (8.4) 79 (20.8) 15 (3.9)
I feel I need more information about my medications Strongly Agree Agree Neutral Disagree Strongly Disagree	138 (36.3) 162 (42.6) 19 (5) 51 (13.4) 10 (2.6)
I am worried about possible damaging long-term effects of taking medications Strongly Agree Agree Neutral Disagree Strongly Disagree	83 (21.8) 138 (36.3) 30 (7.9) 108 (28.4) 21 (5.5)

I am worried that I am too dependent on my medications	
Strongly Agree	76 (20)
Agree	133 (35)
Neutral	27 (7.1)
Disagree	110 (28.9)
Strongly Disagree	34 (8.9)
I am worried that my medications interact with foods, alcohol	
Strongly Agree	87 (22.9)
Agree	147 (38.7)
Neutral	22 (5.8)
Disagree	104 (27.4)
Strongly Disagree	20 (5.3)
-I am concerned that my medications may interact with each other	
Strongly Agree	92 (24.2)
Agree	181 (47.6)
Neutral	23 (6.1)
Disagree	77 (20.3)
Strongly Disagree	7 (1.8)
<b>Interference Domain Questions</b>	
My medications interfere with my social or leisure activities	
Strongly Agree	88 (23.2)
Agree	93 (24.5)
Neutral	16 (4.2)
Disagree	148 (38.9)
Strongly Disagree	35 (9.2)
Taking medications affect my driving abilities	
Strongly Agree	50 (13.2)
Agree	148 (38.9)
Neutral	37 (9.7)
Disagree	108 (28.4)
Strongly Disagree	37 (9.7)
My medications interfere with my social relationships	
Strongly Agree	22 (5.8)
Agree	69 (18.2)
Neutral	20 (5.3)
Disagree	200 (52.6)
Strongly Disagree	69 (18.2)
Taking medicines makes it difficult for me to complete daily activities (such as work, housework, hobbies)	
Strongly Agree	68 (17.9)
Agree	125 (32.9)
Neutral	16 (4.2)
Disagree	146 (38.4)
Strongly Disagree	25 (6.6)
My medication has a negative impact on my sexual life.	
Strongly Agree	15 (3.9)
Agree	64 (16.8)

Neutral	59 (15.5)
Disagree	165 (43.4)
Strongly Disagree	77 (20.3)
My life revolves around using my medications	
Strongly Agree	76 (20)
Agree	175(46.1)
Neutral	26 (6.8)
Disagree	79 (20.8)
Strongly Disagree	24 (6.3)
<b>Autonomy Domain Questions</b>	
I can change the dose of the medication I take	
Strongly Agree	31 (8.2)
Agree	64 (16.8)
Neutral	20 (5.3)
Disagree	201 (52.9)
Strongly Disagree	64 (16.8)
I can decide whether or not to take my medications	
Strongly Agree	51 (13.4)
Agree	121 (31.8)
Neutral	16 (4.2)
Disagree	119 (31.3)
Strongly Disagree	73 (19.2)
I can change the times I take my medications	
Strongly Agree	31 (8.2)
Agree	107 (28.2)
Neutral	17 (4.5)
Disagree	168 (44.2)
Strongly Disagree	57 (15)

**Table 3.7: Differences in proportions of patients agreeing with 41 LMQ items.**

Statements	Agree/Strong Agree, N (%)	Strongly Disagree/ Disagree, N (%)	Neutral, N (%)
<b>1- Relationships (items=5 ;Mean (SD)=10.5 (3.6)</b>			
I trust the decision of my physician(s) in choosing medication for me	299(78.6%)	52(13.6)	29(7.6)
My physician(s) listens to my opinions about my medications	294(77.4%)	57(15%)	29(7.6%)
My physician takes my concerns about side effects seriously	306(85%)	49(12.9%)	25(6.6%)
I get enough information about my medications from my doctor(s)	297(78.2%)	58(15.2%)	25(6.6%)
The healthcare professionals providing my care know enough about me and my medications	289(76.1%)	66(17.3%)	25(6.6)
<b>2- Practicalities (Items= 7 , Mean (SD)=20.3 (3.5)</b>			
I find getting my prescriptions from the doctor hard	126(33.2%)	230(60.5%)	24(6.3%)
I find getting my medications from the pharmacist hard	106(27.9%)	257(67.6%)	17(4.5%)
I am satisfied with the times I should take my medications	317(83.4%)	48(12.6%)	15(3.9%)
I am worried that I may forget to take my medications	276(72.6%)	78(20.5%)	26(6.8%)
I have to put a lot of planning and thought into taking my medications	109(28.7%)	245(64.5%)	26(6.8%)
It is easy to keep to my medication routine	289(76.1%)	71(18.7%)	20(5.3%)
I find using my medications difficult	99(26.1%)	263(69.2%)	18(4.7%)
<b>3- Cost (Items=3, Mean (SD)=8.6 (3)</b>			
I am concerned about paying for my medications	166(43.7%)	190(50%)	24(6.3%)

I sometimes have to choose between buying basic essentials or medications	237(62.4%)	89(23.4%)	25(6.6%)
I have to pay more for my drugs than I can afford	154(40.5%)	204(53.7%)	22(5.8%)
<b>4- Side effects (Items=4, Mean (SD)= 11.1 (3.4))</b>			
The side effects I get are sometimes worse than the disease for which I take medications	218(57.4%)	142(37.4%)	20(5.3%)
The side effects I get from my medications interfere with my daily life (e.g., work, housework, sleep)	275(72.4%)	92(24.2%)	13(3.4%)
The side effects I get from my medications are annoying	203(53.4%)	118(31%)	25(6.6%)
My drug side effects have a negative impact on my health	124(32.6%)	230(60.1%)	26(6.8%)
Statements	Agree/Strong Agree, N (%)	Strongly Disagree/Disagree, N (%)	Neutral, N (%)
<b>5- Lack of effect (Items=6, Mean (SD)=12.8 (3.7))</b>			
I am delighted with the effectiveness of my medications	310(81.6%)	53(13.9%)	17(4.5%)
My medications prevent my condition from getting worse	313(82.4%)	50(13.2%)	17(4.5%)
My medications live up to my expectations	301(79.2%)	47(12.4%)	32(8.4%)
My medications allow me to live my life as I want to	294(77.4%)	69(18.1%)	17(4.5%)
My medications are working	301(79.3%)	53(13.9%)	26(6.8%)
The side effects are worth it for the benefits I get from my medications	298(78.4%)	52(13.7%)	30(7.9%)
<b>6- Concerns (Items=7, Mean (SD)=16.8 (4.9))</b>			
I worry that I have to take several medications at the same time	278(73.2%)	80(21%)	22(5.8%)

I would like to have more say in the brands of medications I use	254(66.8%)	94(24.7%)	32(8.6%)
I feel I need more information about my medications	300(79%)	61(16%)	19(5%)
I am concerned about possible damaging long-term effects of taking medications	221(58.2%)	129(33.9%)	30(7.9%)
I am worried that I am too dependent on my medications	209(55%)	144(37.9%)	27(7.1%)
I am worried that my medications interact with alcohol	234(61.6%)	124(32.6%)	22(5.8%)
I am concerned that my medications may interact with each other	273(71.8%)	84(22.1%)	23(6.1%)
<b>7- Interference (Items=6, Mean (SD)=18.2 (4.7))</b>			
My medications interfere with my social or leisure activities	181(47.6%)	183(48.2%)	16(4.2%)
Taking medications affects my driving abilities	198(52.1%)	145(38.2%)	37(9.7%)
My medications interfere with my social relationships	91(23.92%)	269(70.8%)	20(5.3%)
Taking medications causes me problems with daily tasks (such as work, housework, hobbies).	193(50.8%)	171(45%)	16(4.2%)
My medications have a negative impact on my sexual life	79(20.8%)	242(63.7%)	59(15.5%)
My life revolves around using my medications	251(66.1%)	103(27.1%)	26(6.8%)
<b>8- Autonomy (Items=3, Mean (SD)= 9.9 (2.6))</b>			
I can change the dose of the medications I take	95(25%)	265(69.7%)	20(5.3%)
I can decide whether or not to take my medications	172(45.3%)	192(50.5%)	16(4.2%)
I can change the times I take my medications	138(36.3%)	225(59.2%)	17(4.5%)



**Table 3.8: Effect of demographic and medication-related characteristics of respondents on individual domains of Living with Medicines Questionnaire version-3 LMQ-3 (n=380).**

Median (IQR) domain score (^Maximum possible score)								
Characteristics	Relationships (^25)	Practicalities (^35)	Cost (^15)	Side effects (^20)	Effectiveness (^30)	Concerns (^35)	Interference (^30)	Autonomy (^15)
Gender								
Male	10(7–12)	21(19–22)	10(6–10)	10(8–14)	18(14–20)	18(14–20)	18(15–22)	10(8–12)
Female	10(8–13)	21(19–22)	9(6–10)	11(9–14)	17(12–20)	17(12–20)	18(15–22)	10(8–12)
P-value	0.046	0.793	0.231	0.219	0.11	0.110	0.523	0.692
Age								
<50	10(8–13)	21(17–22.5)	9(6–10.5)	10(8–14)	16(12–19)	16(12–19)	16(12–19)	10(8–12)
50–64	10(8–13)	21(18–22)	9(6–10)	11(9–14)	18(12–21)	18(12–21)	18(12–21)	10(8–12)
>65	10(7–12)	21(19–22)	10(7–10.75)	11(8–14)	18(15–20)	18(15–20)	18(15–20)	10(8–12)
P-value	0.113	0.808	0.168	0.537	0.068	0.068	0.068	0.110
Locality								
Urban	10(8–13)	21(18–22)	9(6–11)	10(8–14)	17(12–2)	17(12–21)	18(14–21)	10(8–12)
Rural	9(7–11)	21(19–22)	10(7–10)	11(9–14)	18(14.5–19)	18(14.5–19)	19(16–22)	10(8–12)
Refugee camp	9(8–11)	20.5(18.25–2.75)	7.5(6–9)	11(8–13)	16(12.5–20.5)	16(12.25–20.5)	20.5(14–23)	10(9–12)
P-value	0.001	0.694	0.080	0.210	0.312	0.312	0.061	0.293
Health Insurance								
No	11(9–13)	21(19–22)	9(7–11)	10(8–14)	18(14–20)	18(14–20)	17(14–21.75)	10(7–12)
Yes	10(7–12)	20(17–23)	9(6–10)	11(8–14)	17(13–20)	17(13–20)	19(15–22)	10(8–12)
P-value	0.015	0.003	0.518	0.550	0.696	0.696	0.094	0.270
No. of Diseases								
One Disease	10(8–13)	21(19–22.25)	10(8.75–12)	12(10–14)	18.5(16–21.25)	18.5(16–21.25)	20(17–23)	10(8–12)
Two Diseases	10(8–13)	21(19–22)	9(6–10)	12(9–14)	18(13–21)	18(13–21)	19(15–22)	10(8–12)
Three Diseases	9(7–11)	21(19–22)	9(6–10)	10(8–14)	17(12–18.25)	17(12–19.25)	18(14–22)	10(8–12)
Four Diseases	10(7–14)	20(18–22)	9(5–10)	10(8–13)	16(12.5–19.5)	16(12.5–19.5)	17(13.5–21)	10(8–12)
Five Diseases & More	10(7.25–12.5)	20.5(17.25–22)	8.5(4.25–10)	10(9–11.75)	15.5(12–20.5)	15.5(12–20.5)	17.5(13.5–20)	10(8–12)
P-value	0.146	0.744	0.031	0.020	0.080	0.080	0.013	0.651

CO-morbidity CVD without como	10(7–13)	21(19–22)	10(8–10)	12(9–14)	18(16–21)	18(16–21)	20(16–22)	10(8–12)
CVD with como P-value	10(8–13) 0.253	21(18–22) 0.568	9(5.75–10) 0.007	10(8–14) 0.136	16(12–20) 0.00	16(12–20) 0.00	18–14–22) 0.021	10(8–12) 0.137
#Of medications 1–4 5–9 >10 P-value	10(8–13) 10(8–13) 10(9–20) 0.258	21(19–22) 21(18–22) 19(20–17) 0.163	9(6–10) 9(6–10) 5(5–12) 0.569	11(9–14) 10(8–14) 9(7–14) 0.128	18(13–20) 17(13–20) 13(9–26) 0.651	18(13–20) 17(13–20) 13(9–26) 0.651	19(15–22) 17(14–21) 15(11–20) 0.008	10(8–12) 10(7.75–12) 12(12–12) 0.006
Formulation used  Tablet/capsule Tablet/Capsule with other formulations  P-value	  10(8–12) 10(8–15)  0.105	  21(19–22) 21(18–23)  0.259	  9(6–10) 9(5.75–9)  0.970	  11(8–14) 11.5(8–14.25)  0.507	  18(13–20) 16(13–22)  0.806	  18(13–20) 16(13–22)  0.806	  18(15–22) 18(14–22)  0.542	  10(8–12) 11(8–12)  0.027
Medication Frequency  Once daily Twice daily Three times daily More than 3 Times  P-value	  10(8–13) 10(8–13) 10(9–15) 8(6.5–12)  0.431	  21(19–22) 21(18–22) 20(18–22) 20(17–22)  0.533	  10(6–10) 9(6–10) 10(6–12) 6(3.5–10)  0.114	  11(9–14) 11(8–14) 10(7–14) 8(7–9.5)  0.071	  18(14–20) 17(12–20) 16(12–21) 13(10–17)  0.053	  18(14–20) 17(12–20) 16(12–21) 13(10–17)  0.053	  19(15–22) 18(15–22) 17(14–21) 15(12–18)  0.055	  10(8–12) 10(8–12) 11(9–12) 13(7.5–14.5)  0.131

IQR interquartile Range, p-value<0.05 mean significant, Higher score indicating a greater burden

**Table 3.9: Perceived medication-related burden measured using Living with Medicines Questionnaire version-3 (LMQ-3) and VAS (n=380).**

Variable	Range	Mean (SD)	Median (IQR)	Frequency (%)
LMQ overall score	(41–205)	108.2(16)	108(19.8)	
No burden at all	(41–73)			7(1.8%)
Minimum burden	(74–106)			149(39.2%)
Moderate burden	(107–139)			217(57.1%)
High burden	(140–172)			7(1.8%)
Theme 1: Communication/relationships with healthcare professionals about medicines	(5–25)	10.5(3.6)	10(5)	
Theme 2: Practical difficulties	(7–35)	20.3(3.5)	21(3)	
Theme 3: Cost-related burden	(3–15)	8.6(3)	9(4)	
Theme 4: Side-effects burden	(4–20)	11.1(3.4)	14(6)	
Theme 5: Perceived effectiveness of medicines	(6–30)	16.8(4.9)	17.5(7)	
Theme 6: Attitudes/concerns about medicine use	(7–35)	16.9(5.4)	17.5(7)	
Theme 7: Impact/interferences with day-to-day life	(6–30)	18.2(4.9)	18(7)	
Theme 8: Control/autonomy of medicine use	(3–15)	9.9(2.6)	10(4)	
VAS: Global burden	(0–10)	5.2(2.3)	5.0(3)	

Table 3.9 presents the perceived medication-related burden (MRB) measured using LMQ-3 and VAS. The vast majority of the study populations are perceived to suffer from minimum to moderate degrees of burden.

## **Chapter Four**

### **Discussion**

#### **4.1 Discussion**

The present study appears to be the first in Palestine and probably in Jerusalem that measures the burden of using cardiovascular medications from the perspective of patients' living by using the LMQ. The first study conducted using this questionnaire in the Arab world was in Qatar for diabetic patients (Zidan et al., 2018a). A second new study was carried out in Kuwait among geriatric patients (Awad et al., 2020). Another study in Palestine quantified the level of knowledge and medication adherence among Palestinian geriatrics with chronic diseases and looked at potential associations with socio-demographic factors (Najjar et al., 2015).

Socio-demographic findings of the current study were relatively close to the results of a descriptive cross-sectional survey that was implemented on 450 hypertensive patients from government primary healthcare centres' outpatient clinics and a group of private clinics and pharmacies in West Bank, Palestine, in 2011. The aim of that study was to evaluate the Palestinian hypertensive patients' adherence to therapy and the influence of a variety of demographic and psychosocial factors on medication adherence (Al-Ramahi, 2015). In that study, the majority of patients were female (253(56.2%)) with an average age of 59.1( $\pm$ 12.2) years, living in the city, and had health insurance. Similar results were detected in the current study in which the female patients accounted for 195(51.3%), with an average

age  $\pm$  SD of  $58 \pm 12.2$ , most of them living in urban areas and with health insurance.

The patients of the current study had some chronic diseases with a mean  $\pm$  SD of  $2.68 \pm 1.17$  and median (interquartile range) of 3 (2–3) illnesses with a maximum of 8 diseases. Similar findings were observed in a study that was done to evaluate the factors that influence coronary heart disease (CHD) patients' quality of life (QoL) and to assess the patterns of cardiac self-efficacy (CSE) and quality of life (QoL) among CHD patients., in which 30% of the patient have two chronic diseases (Barham et al., 2019).

Regarding CVDs, 259 (68.2%) of this study' patients had hypertension, followed by 102 (26.8%) with ischaemic heart diseases, 64 (16.8%) with heart failure, and 12 (3.2%) with atrial fibrillation. Similar findings were observed in a research that was done to classify the incidence of medication therapy problems among hospitalized patients with cardiovascular disorders in Felege Hiwot Referral Hospital, where the most common CVDs encountered were hypertensive heart disease (32.9%), rheumatic heart disease (31.6%), functional heart failure, and cor pulmonale (18.4%) (Tegegne et al., 2014).

On the other hand, regarding other co-morbid diseases, most of the patients in this present study suffered from diabetes mellitus (n=178, 46.8%), followed by dyslipidaemia (n=158, 41.6). A similar finding was observed in a study done to assess the prevalence, types and factors linked to the possibility of drug–drug interactions among patients with cardiovascular

disease, in which the most common co-morbid disease was diabetes mellitus affecting 205 (51.2%) patients, followed by chronic kidney disease in 56 (14%) patients (Aldabe et al., 2016).

With regard to medications used, the number of medications used among patients ranged from 1–13, with a mean ( $\pm$ SD) of  $4 \pm 1.71$  and median (interquartile range) of 4 (3–5). A similar finding was observed in the study investigating the factors that influence antihypertensive medication adherence in hypertensive patients, as well as the correlation between treatment satisfaction and adherence. As a result, 42% of patients took 6 or more drugs, with a median (interquartile range) of 6.8. (4.8–8.0) (Zyoud et al., 2013).

In the current study, with regard to patients' medications, aspirin (n=181, 47.6%), atorvastatin (n=134, 35.5%), metformin (n=104, 27.4%), and bisoprolol (n=90, 23.7%) were the most commonly used medications. Similar findings were observed in (Aldabe et al., 2016) study in which aspirin was the most frequently prescribed medication for cardiovascular patients.

On the other hand, nearly all of the patients took an oral solid-dose formulation, with 314 (82.6%) using tablets or capsules, while 17.4% of patients used tablets or capsules with other formulations. In a previous study, similar results were reported whereby 325(76.7%) used tablets or capsules, while 99 (23.3%) used tablets or capsules with other formulations (Awad et al., 2020).

More than 50% of the patients in the current study reported using medicines once daily, and 34% reported using twice daily; while in the previous survey that was done on geriatric patients, 46.9% of patients used drugs three times, and in 31.6% the frequency of daily dose was twice daily (Awad et al., 2020).

Since evaluating MRB using the LMQ-3 is still relatively recent, there are few studies with which to compare the present research. The current results are best compared to previous LMQ-3 studies conducted in Qatar, England, and Kuwait. We quantify MRB by using LMQ and VAS. According to our present research, the great majority (96.3%) of respondents self-reported suffering from a minimum (39.2%) to moderate (57.1%) degree of burden. Similar findings were observed in a previous study (Awad et al., 2020), in which the majority (97.4%) of geriatric participants self-reported suffering from a minimum (35.4%) to moderate (62.0%) degree of burden. Also, another study (Krska et al., 2019) found that most patients were suffering from a minimal (33.1%) to moderate (53.6%) degree of burden. On the other hand, the study by (Zidan et al., 2018b) in Qatar showed different findings, whereby the majority of the participants experienced minimal (66.8%) to moderate (24.1%) degrees of burden; this may be due to the differences among the study population.

In the present study, the median (IQR) LMQ overall score was 108(19.8), which is a moderate burden. This is similar to (Awad et al., 2020) in Kuwait, in which the score was 112(21), and greater than the minimum

burden in the study conducted in Qatar (95%) (Zidan et al., 2018a) and in England (99.7%) (Krska et al., 2018).

Furthermore, the present research indicates that the evaluation mean of the global burden by the VAS score was 5.2, which is similar to (Awad et al., 2020) that equals to 5; and higher than the score of 3 reported in Qatar (Zidan et al., 2018a). These variations may be related to the fact that both studies had a lower percentage of geriatric patients (Zidan et al., 2018b). In the Qatari study, 37 (12.6%) patients were geriatrics, and in the English study, 277 (41.9%) patients were geriatrics, compared with 175 (46%) geriatric patients in our study. Also, this may be related to cultural differences between countries.

Demographic and medication-related characteristics affected scores among some domains in the questionnaire: female gender gave a higher score of burden related to relationships with healthcare providers. A similar finding was observed in a higher level of MRB among females (Zidan et al., 2018a, Sav et al., 2013, Sav et al., 2015), while disagreement with previous studies was seen in Kuwait (Awad et al., 2020), in which males had a higher level of burden and non-significant difference dependent on gender (Krska et al., 2018). Female respondents had significantly higher scores of a burden in communication/relationships with healthcare providers in terms of medications and perceived efficacy of medicines, which may be attributed to culture and feeling the burden of communication with healthcare professionals.



There was no significant correlation between patient age and LMQ domain score in this study; similar results were observed in Qatari and England research, which found that burden score was not strongly linked to age (Katusiime et al., 2018, Zidan et al., 2018a), in contrast to the study by (Awad et al., 2020) where there was a significant association among patients >75 years in which scores of burden were higher than for those aged less than 75.

The current results showed that patients resident in the urban region had a higher level of burden than those living in rural or refugee camps, especially the relationship domain. This could be explained by a higher percentage of participants from the urban region (60%). One study illustrated that one of the most common cardiovascular diseases – hypertension – in urban areas was slightly higher than in rural areas. Still, the variation was insignificant. (28.2 and 26.6%, respectively) (Khdour et al., 2013). No difference in burden and adherence was seen between urban and rural cardiovascular patients (Murphy et al., 2014).

Another demographic factor associated with burden domains is health insurance, whereby lacking health insurance gave higher scores of burden related to relationships and communications with healthcare professionals. A similar result was observed for uninsured diabetic patients suffering cost-related medication underuse, more complications, as well as a worsening in physical and mental health (Piette et al., 2004).

In the current study, the number of diseases that the patients had affected some types of burden domains, such as costs, side effects and interference with daily life; we observed that patients with (one or two) had more burden, and a high percentage of patients in our study had one or two diseases. This may be related to the fact that patients with a low number of diseases are newly diagnosed and still not used to their disease and medications and feel every single change from the side effects of the drug or disease itself that affects and interferes with their daily lives.

With regard to the effect of the medicine-related characteristics on MRB, respondents using an oral solid dose with other non-oral formulations have a higher burden on control/autonomy of medicine use; similar results were seen with (Awad et al., 2020), in which respondents using oral medications with non-oral formulations revealed significantly higher levels of burden, as well as the high burden among those using non-oral reported in Qatar (Zidan et al., 2018a), but are in contrast to the English studies which did not find significant differences dependent on the type of formulations (Krska et al., 2018, Krska et al., 2019). It seems non-oral dosage forms, such as injections, inhalers and eye drops increase the burden perceived concerning the autonomy domain that is related to control of medicine use. This demonstrates that the use of various medicine formulations with multiple instructions that require varying degrees of effort in order to be successfully used is burdensome to patients.

In the present study, LMQ domain scores showed a significant association between the number of medications patients used and both interference with day-to-day life and the control/autonomy of the drug, whereby patients using from 1–4 medications showed the highest burden in these domains, with more than 66% of patients present in this range of medication use. Furthermore, previous research has shown that some patients are burdened by a small number of drugs, while others do not consider a large number of medicines to be burdensome (Tran et al., 2012); it was recognized by other studies that even one medicine might demonstrate some burden for some people, as shown by our data and as reported by others (Mohammed et al., 2016, Zarowitz, 2011, Krska et al., 2018). Another study (Robertson et al., 2008) suggested that concerns regarding medication burden do not prevent physicians from adding more medications to a patient's schedule. Another research revealed that physicians were more ready to initiate hypertension, diabetes and lipid-lowering drug therapies in patients who were still taking several medications for other chronic diseases, indicating that the number of medications used was not a barrier to initiating new treatments (Voorham et al., 2010).

This present study showed that from the perspective of patients, medication-related overall burden is multifactorial, with more than the total number of drugs required to meet the threshold of polypharmacy contributing to medications burden.

## **4.2 Strengths and Limitations**

To the extent of our knowledge, this research is the first in Palestine regarding CVD and the impact of its medications on patients' daily lives, and that examines the relationship between demographic and clinical characteristics. Focusing on and highlighting the predictors of medication-related burden, the study includes some private pharmacies in Jerusalem using the target sample size. Furthermore, the data were recruited via face-to-face interviews, giving complete and valid data.

However, our study had some limitations; first, it lacked some of the demographic variables, such as level of education, marital status, income, employment status, and smoking. Second, the sample size was selected by a convenience sampling technique, which may disturb the findings' generalizability. Third, as the mainstream data were conducted via face-to-face interviews, bias could be present. Although face-to-face interviews provide accurate screening, the capture of verbal and non-verbal questions shows the level of discomfort with questions and captures the behaviour and emotions. Fourth, the sample was derived from private pharmacies and pharmacies in clinics and a more significant number of pharmacies from far regions may be required, in order for the result to be more generalized.

## **Chapter Five**

### **Conclusion**

#### **5.1 Conclusion**

The present study indicates that the vast majority (96.3%) of CV patients suffered from minimum to moderate medication-related burden (MRB). Additionally, the current findings showed that the assessment mean of the global burden by the VAS score was 5.2, which indicates medium burden. The present study LMQ domain score revealed a significant burden among female gender, living in urban areas, without insurance, with one or two diseases, using 1–4 medicines, using oral solid dose with other non-oral formulations for some domains. The result demonstrated that the MRB for the study population is multidimensional. Therefore, there is a need for clinicians to play a more active role in understanding patients' burden in using medications, and to recognize specific personal issues related to MRB that the patients cope with. Patients should be given a treatment care plan that suits their life by taking into consideration factors affecting medication-related burden when creating targeted interventions to minimize this burden. Better understanding of the patients' experiences of using their medications through using LMQ-3 personally can help healthcare professionals provide individually tailored therapeutic care plans to achieve the best possible benefits for patients. Additionally, expanding pharmacists' roles, especially clinical pharmacists, can assist doctors in estimating a patient's MRB through the implementation of pharmaceutical care.

## **5.2 Recommendation**

Health care professionals should evaluate various factors of treatment burden when prescribing medicines to patients. These include having a common understanding of the goals of treatment, the possibility of side effects, and the lifestyle implications. Healthcare providers should assist patients in making well-informed treatment decisions in order to maximize benefits while minimizing risks. There is a big role for pharmacists to have a significant impact on reducing medication burden, as they have the expertise to detect, resolve, and prevent medication errors and medication-related problems. Pharmacist-provided services and clinical interventions that lower the risk of possible adverse medication events and enhance patient outcomes, in which that these pharmacist activities are cost-effective. Clinical pharmacist assist in identification, evaluation and prevention of patient-and prescriber-related problems, also increase patient's knowledge and awareness by providing counselling leading to reduction in DRPs to a greater extent.

We recommend the use of LMQ-3 in clinics and pharmacies by healthcare professionals to provide an individual therapeutic care plan for each patient to minimize MRB and reach optimal patient outcomes.

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## Appendices

### Appendix 1

#### Data Collection Form



An- Najah National University  
Faculty of Medicine and Health Sciences  
Master of Clinical Pharmacy Program  
**Data Collection Form**

#### **A. Patient demographic characteristics**

**A.1 Patient number:** \_\_\_\_\_

**A.2 Age:** \_\_\_\_\_ years

**A.3 Gender:** ☐ Male ☐ Female

**A.4 Locality:**

☐ Urban ☐ Rural ☐ Camp

**A.5 Health insurance** ☐ Yes ☐ No

#### **B. History and disease co-morbidities**

**B.1 The main diagnosis:** .....

**B.2 Co-morbidities:**

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Diabetes mellitus         | <input type="checkbox"/> Dyslipidemia        | <input type="checkbox"/> Renal failure  |
| <input type="checkbox"/> Polycystic Kidney Disease | <input type="checkbox"/> Nephrotoxicity      | <input type="checkbox"/> UTI            |
| <input type="checkbox"/> Stroke                    | <input type="checkbox"/> Systemic infection  | <input type="checkbox"/> Urinary Stones |
| <input type="checkbox"/> Anemia                    | <input type="checkbox"/> Hyperparathyroidism | <input type="checkbox"/> Peptic ulcer   |
| <input type="checkbox"/> Others: .....             |  |   |

**Medications Used:**

	<b>Drug name</b>	<b>Drug dose</b>	<b>Frequency</b>	<b>Route</b>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10				

## الأدوية وحياتك اليومية - استبيان التعايش مع الأدوية

تغطي الجمل التالية الجوانب المختلفة لاستخدام الأدوية.

الرجاء قراءة كل جملة بعناية ووضع علامة في مربع الاجابة الأقرب الى رأيك الشخصي يرجى اختيار مربع واحد فقط لكل جملة.

الرقم	أوافق بشدة	أوافق	رأي محايد	لا أوافق	لا أوافق بشدة
1					أجد أن الحصول على وصفات دوائي من الطبيب صعباً
2					أجد أن الحصول على أدويتي من الصيدلي صعباً
3					أنا راض عن فعالية أدويتي
4					إنني أتعلم أن أتناول الأدوية في الأوقات المحددة لها
5					يقلقني أن أدفع لقاء أدويتي
6					يقلقني تناول عدة أدوية في نفس الوقت
7					أثق برأي طبيبي في اختيار أدويتي
8					أود أن يكون لي دور أكبر في اختيار الاسم التجاري للدواء الذي أستخدمه
9					أشعر أحياناً بالحاجة للحصول على معلومات أكثر عن أدويتي
10					ينتابني القلق من أنني قد أنسى تناول أدويتي
11					يمكنني تغيير جرعة الأدوية التي أتناولها وفق حاجتي
12					ينتابني القلق إزاء الآثار الضارة المحتملة من تناول الأدوية على المدى البعيد
13					أستطيع الاختيار بين تناول أدويتي أو عدم تناولها
14					يستمع طبيبي الى آرائي بشأن أدويتي
15					تمنع أدويتي حالتي الصحية من أن تسوء
16					يقلقني اعتمادي التام على أدويتي
17					يقلقني احتمال تفاعل أدويتي مع عاداتي الغذائية (مشروبات ، أطعمة أخرى)
18					يقلقني أن تتفاعل أدويتي مع بعضها البعض
19					تؤثر أدويتي على نشاطاتي الاجتماعية أو الترفيهية

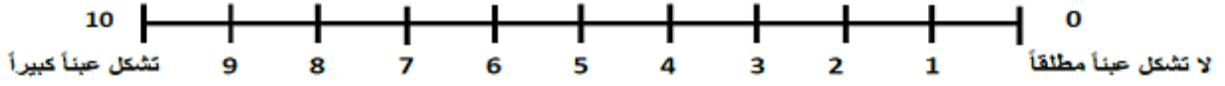


الرقم		أوافق بشدة	أوافق	رأي محايد	لا أوافق	لا أوافق بشدة
20	يهتم طبيبي بما يقلقني حول التأثيرات الجانبية للدواء					
21	الآثار الجانبية للدواء تكون أحياناً أسوأ من المشكلة الصحية التي أتناول الدواء من أجلها					
22	الآثار الجانبية الناتجة عن أدويتي تؤثر على حياتي اليومية مثل (العمل، الأعمال المنزلية، النوم)					
23	يتطلب تناول أدويتي الكثير من التخطيط والتفكير مني					
24	أحصل على معلومات كافية من طبيبي عن أدويتي					
25	أدويتي تحقق توقعاتي منها					
26	أستطيع تغيير مواعيد تناول أدويتي إذا أردت ذلك					
27	من السهل الحفاظ على روتين تناول أدويتي					
28	تناول الأدوية يؤثر على قدرتي على قيادة السيارة					
29	أجد استخدام أدويتي أمراً صعباً					
30	الآثار الجانبية الناتجة عن أدويتي مزعجة					
31	علي الاختيار أحياناً بين شراء الحاجات الأساسية أو الأدوية					
32	أدويتي تسمح لي بأن أعيش حياتي كما أريد					
33	ما يتوجب علي إنفاقه على شراء الأدوية يفوق مقدرتي					
34	اختصاصيو الرعاية الصحية الذين يوفررون الرعاية لي يعرفون ما يكفي عني وعن أدويتي					
35	تؤثر أدويتي على علاقتي الاجتماعية					
36	يسبب لي تناول الأدوية مشاكل مع أنشطتي اليومية (كالعمل، و الأعمال المنزلية والهوايات)					
37	أدويتي تؤثر على حياتي الجنسية					
38	الآثار الجانبية الناتجة عن أدويتي تؤثر سلباً على صحتي					
39	أدويتي فعالة					
40	الفوائد التي أحصل عليها من الدواء تفوق الآثار الجانبية					
41	أدويتي تشغل حيزاً كبيراً من حياتي					

يهدف السؤال التالي لمعرفة رأيك الاجمالي عن كل أدويةك الموصوفة.

الرجاء وضع علامة X في الموقع الأقرب الى رأيك:

1- بشكل عام، كيف تشعر بالعبء الذي تشكله أدويةك ؟



إذا كانت لديك أية آراء أخرى حول مدى تأثير أدويةك على حياتك اليومية، يرجى ذكرها هنا

شكراً جزيلاً على تخصيص الوقت لاستكمال هذا الاستبيان

## Appendix 2

### Scoring of LMQ-3 items and subscales/domains

#### Subscale/ domain scores

[1] Interferences score =  $Q19 + Q28 + Q35 + Q36 + Q37 + Q41$

[2] Side-effect-burden score =  $Q21 + Q22 + Q30 + Q38$

[3] General concerns score =  $Q6 + Q8 + Q9 + Q12 + Q16 + Q17 + Q18$

[4] Practical difficulties score =  $Q1 + Q2 + Q4 + Q10 + Q23 + Q27 + Q29$

[5] Lack of effectiveness score =  $Q3 + Q15 + Q25 + Q32 + Q39 + Q40$

[6] Patient-doctor communication problem score =  $Q7 + Q14 + Q20 + Q24 + Q34$

[7] Cost –burden score =  $Q5 + Q31 + Q33$

[8] Lack of autonomy score =  $Q11 + Q13 + Q26$

#### Total scale score

= [1] + [2] + [3] + [4] + [5] + [6] + [7] + [8]

## Appendix 3

## Institutional Review Board Approval Letter

An-Najah  
National University  
Faculty of medicine  
& Health Sciences  
Department of Graduate  
Studies



جامعة النجاح  
الوطنية  
كلية الطب وعلوم الصحة  
دائرة الدراسات العليا

REF:MAS

Approval Letter

Study Title:

**"The impact of medication on daily lives of patients with cardiovascular diseases:  
a cross sectional study"**

Submitted by:

Rasha Tirhi

Supervisor:

Dr. Samah Al-Jabi  
Dr. Sa'ed Zyoud

Date Reviewed:

19<sup>th</sup> November 2018

Date Approved:

21<sup>st</sup> November 2018

Your Study titled "**The impact of medication on daily lives of patients with cardiovascular diseases: a cross sectional study**" with archived number (25) November was reviewed by An-Najah National University IRB committee and was approved on 26<sup>th</sup> November 2018

Hasan Fitian, MD



IRB Committee Chairman

An-Najah National University

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## Appendix 4

## Faculty of Graduate Study Approval

**An-Najah  
National University**  
Faculty of Graduate Studies  
Dean's Office



جامعة  
النجاح الوطنية  
كلية الدراسات العليا  
مكتب العميد

التاريخ ، 2018/12/6

حضرة الدكتور رواء الرمحى المحترمة  
منسقة برنامج ماجستير الصيدلة السريرية  
تحية طيبة وبعد ،

الموضوع ، الموافقة على عنوان الأطروحة وتحديد المشرف

قرر مجلس كلية الدراسات العليا في جلسته رقم (368)، المنعقدة بتاريخ 2018/12/6، الموافقة على مشروع الأطروحة المقدم من الطالب/ة رشا يوسف محمد ترمي، رقم تسجيل 11659441، تخصص ماجستير الصيدلة السريرية، عنوان الأطروحة: (تأثير الأدوية على الحياة اليومية لمرضى الأمراض القلبية والوعائية: دراسة مقطعية)  
(The Impact of Medications on Daily Lives of Patients with Cardiovascular Diseases: A Cross Sectional Study)

بإشراف: (1) د. سماح الجابي (2) د. سائد زيود

يرجى اعلام المشرف والطالب بضرورة تسجيل الأطروحة خلال اسبوعين من تاريخ اصدار الكتاب. وفي حال عدم تسجيل الطالب/ة للأطروحة في الفترة المحددة له/ا ستقوم كلية الدراسات العليا بإلغاء اعتماد العنوان والمشرف

وتفضلوا بقبول وافر الاحترام ،،،

د. علي عبد الحميد  
  
عميد كلية الدراسات العليا



نسخة : د. رئيس قسم الدراسات العليا  
: ق.أ.ع. القبول والتسجيل المحترم  
: مشرف الطالب  
: ملف الطالب

ملاحظة: على الطالب/ة مراجعة الدائرة المالية (محاسبة الطلبة) قبل دفع رسوم تسجيل الأطروحة للضرورة

جامعة النجاح الوطنية

كلية الدراسات العليا

تأثير الأدوية على الحياة اليومية لمرضى الأمراض القلبية والوعائية:  
دراسة مقطعية

إعداد

رشا يوسف ترهي

إشراف

د. سماح الجابي

د. سائد زيود

قدمت هذه الأطروحة إستكمالاً لمتطلبات الحصول على درجة الماجستير في برنامج الصيدلة السريرية، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس - فلسطين.

2021

ب

تأثير الأدوية على الحياة اليومية لمرضى الأمراض القلبية والوعائية:

دراسة مقطعية

إعداد

رشا يوسف ترهي

إشراف

د. سماح الجابي

د. سائد زيود

الملخص

**الخلفية:** يؤثر استخدام أدوية القلب والأوعية الدموية على جوانب مختلفة من حياة المرضى اليومية ونوعية حياتهم، مما يشكل عبئاً كبيراً عليهم. يؤثر عبء الأدوية بشكل ملحوظ على معتقداتهم الدوائية وسلوكياتهم وحالتهم الصحية. لذلك يعد تقييم عبء الأدوية من جانب ووجهة نظر المرضى مسعى مهماً لتحديد أي عوائق قد تمنع تحقيق النتائج الصحية المثالية المطلوبة.

**الأهداف:** هدفت الدراسة الحالية إلى استخدام استبيان التعايش مع الأدوية -3 (LMQ-3) لتحديد عبء استخدام الادوية بين مرضى القلب والأوعية الدموية، وتقييم تأثير استخدام أدوية القلب والأوعية الدموية المزمدة على جوانب مختلفة من حياة المرضى اليومية، ودراسة العلاقة. بين الخصائص الديموغرافية والسريرية لدرجات الحياة اليومية للمرضى.

**المنهجية:** هذه الدراسة عبارة عن دراسة وصفية مقطعية. تم تطبيقها على مرضى من الصيدليات المجتمعية، الذين استخدموا أدوية القلب والأوعية الدموية في القدس - فلسطين، خلال الفترة من كانون الثاني إلى تشرين الأول 2019. تتكون استمارة جمع البيانات من معلومات ديموغرافية وسريرية عن المرضى، استبيان التعايش مع الأدوية (LMQ-3) الذي يقيس تأثير استخدام الأدوية على حياة المرضى اليومية والمقياس (VAS) وهو مقياس من 1 إلى 10 يقيس العبء الذي يشكله استخدام الادوية بشكل عام من وجهة نظر المريض.

**النتائج:** شارك في الدراسة 380 مريضاً يعانون من امراض القلب والاعوية الدموية. متوسط أعمارهم  $(58 \pm 12.2)$  سنة، وغالبية المرضى لديهم تأمين صحي (76.8%)، (59.7%) من سكان المدينة، و259 (68.2%) من المرضى يعانون من ارتفاع ضغط الدم، وفقاً لبحثنا الحالي الذي استخدم فيه استبيان LMQ تبين ان عبء استخدام الادوية كبير بين الاناث، الذين يسكنون في المدينة، من غير تأمين صحي، الذين يعانون من مرض أو مرضين، يستخدمون 1-4 أدوية، ويتم استخدام الادوية عن طريق الفم مع طرق اخرى غير فموية. الغالبية العظمى (96.3%) يعانون من حد أدنى (39.2%) إلى متوسط (57.1%) من العبء كانت النتيجة الإجمالية المتوسطة (19.8) LMQ 108 (IQR)، والتي تعتبر عبئاً متوسطاً. علاوة على ذلك، أشار البحث الحالي إلى أن متوسط تقييم العبء العالمي بمؤشر VAS كان 5.2، (2.3) SD مما يشير إلى عبء متوسط.

**الخلاصة:** يتوجب على مقدمي الرعاية الصحية الاخذ بعين الاعتبار تأثير العديد من ادوية الامراض المزمنة على حياة المريض اليومية وبذل الجهد لتقليل العبء المتعلق بالأدوية على المرضى باستخدام LMQ-3 للمرضى المستهدفين لتوفير خطط رعاية علاجية فردية مخصصة للوصول إلى أفضل النتائج الممكنة للمرضى. بالإضافة إلى ذلك، فإن توسيع أدوار الصيدالة، وخاصة الصيدلة السريرية، يمكن أن يساعد الأطباء في تقدير MRB للمريض من خلال تنفيذ الرعاية الصيدلانية.