**An-Najah National University** 

**Faculty of Graduate Studies** 

# Needs and Interests of Pharmacists in Counseling and Promoting Healthy Practices Regarding Breast Cancer in Palestine: A Study Among Pharmacists and Patients with Breast Cancer

By

Hiba Awawdeh

**Supervisor** 

Dr. Ramzi Shawahna

This Thesis is Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Pharmacy, Faculty of Graduate Studies, An-Najah National University, Nablus, Palestine.

2021

## Needs and Interests of Pharmacists in Counseling and **Promoting Healthy Practices Regarding Breast Cancer** in Palestine: A Study Among Pharmacists and Patients with Breast Cancer

By

Hiba Awawdeh

This Thesis was Defended Successfully on 14/1/2021 and approved by:

**Defense Committee Members** 

- Dr. Ramzi Shawahna / Supervisor

– Dr. Thaer Abd ELghani/ External Examiner

- Dr. Saed Zyoud/Internal Examiner

Signature

## **Dedication**

I dedicate my dissertation work to my beloved father whom I always looked up to and who was the reason of all of my success. A special gratitude to my dearest mother who filled me with her love and tenderness. My caring family who keeps supporting me. My friends who appreciated all I've done and supported me throughout the process.

I dedicate this work to all students and researchers everywhere.

(Needs and interests of pharmacists in counseling and promoting healthy practices regarding breast cancer in Palestine: a study among pharmacists and patients with breast cancer) is the result of my efforts.

### Acknowledgment

I would like to express my gratitude and appreciation to all of you who has helped and guided me to writing this dissertation. My supervisor' Dr. Ramzi Shawahna and the entire staff of Faculty of Medicine and Health sciences. An-Najah National University, which was the reason that brought this work to light.

Also, I am very grateful to all hospitals and medical institutions that supported me through providing all facilitations to reach out to the patients nicely and smoothly. Further, my sincere thanks go to the patients and fellowpharmacists who gave me some of their time to help me throughout this work.

Finally, a million thanks to my family and friends who had my back until the end and supported me in many ways.

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

## Needs and Interests of Pharmacists in Counseling and Promoting Healthy Practices Regarding Breast Cancer in Palestine: A Study Among Pharmacists and Patients with Breast Cancer

أقر بأن ما اشتملت عليه هذه الرسالة انما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة اليه حيثما ورد، وأن هذه الرسالة ككل أو أي جزء منها لم يقدم من قبل لنيل أي درجة علمية أو بحث 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.

**Student Name:** 

اسم الطالبة: هبة عواوده

Signature:

التوقيع:

التاريخ: 2 2 / / / ١٩

Date:

## List of Content

No.	Content	Page
	Dedication	III
	Acknowledgment	IV
	Declaration	V
	List of Content	VI
	List of Tables	VIII
	Abstract	IX
	Chapter One Introduction	1
1.1	Background.	2
1.2	Gaps in existing research.	5
1.3	Why this study needs to be conducted.	6
1.4	Rationale behind this study.	6
1.5	Scope of study	7
1.6	Significance of this study.	7
1.7	Implications of this study on practice and/or resear	8
1.8	Objective	9
	Chapter Two Literature Review	10
2.1	Chemotherapy and the pharmacist's role:	11
2.2	Endocrine therapy and the pharmacist's role:	12
2.3	How the pharmacist plays a role in increasing patient	14
	awareness and promoting recuperation:	
2.4	Limited knowledge that pharmacists have about breast cancer:	16
2.5	Roles of pharmacists in hospitals	19
2.6	Pharmacists and the detection of breast cancer	20
	Chapter Three Methodology	23
3.1	Study design	24
3.2	Sample size	25
3.3	The study tool	27
3.4	Reliability and psychometric evaluation	30
	Chapter Four Results	31
	Chapter Five Discussion	50

Conclusion	56
Recommendations.	56
References	58
Appendix	80
الملخص	ب

## List of Tables

VIII

No.	Table	Page
Table 1	Demographic & experience of the pharmacist in the	34
	study.	
Table 2	Correlations between variables of pharmacists and	36
	knowledge score	
Table 3	Correlation between multivariate and knowledge	39
	scores.	
Table 4	The level of knowledge for the pharmacist about breast	39
	cancer	
Table 5	Pharmacists' beliefs about providing medical advice	43
	regarding breast cancer	
Table 6	The barriers defined by participants that prevent	46
	pharmacists from being included in the breast cancer	
	health promotion	
Table 7	Demographics of patients & their impressions on	49
	pharmacists:	

## Needs and Interests of Pharmacists in Counseling and Promoting Healthy Practices Regarding Breast Cancer in Palestine: A Study Among Pharmacists and Patients with Breast Cancer

By Hiba Awawdeh Supervisor Ramzi Shawahna

#### Abstract

Breast cancer is a serious disease that accounts for a distressing percentage of patients and deaths among women in Palestine. Pharmacists fulfil an important role in the medical sector and likewise play a vital role in breast cancer treatment. This study aims to further explore the existing level of knowledge among pharmacists in Palestine involved in breast cancer care, in addition to understanding their tendency and willingness to contribute to breast cancer medication plans. Furthermore, the study will shed light on the existing capabilities of pharmacists and what avenues they take to enhance their knowledge of breast cancer treatment. As part of the study, breast cancer patient customer experiences with pharmacists have also been analysed, taking full account of the relative pharmacist's level of knowledge and extent of his/her cooperation in dealing with customer enquiries. This study was conducted using a cross-sectional observational design approach, with a dual-style questionnaire - aimed at both pharmacists and patients alike in Palestine's West Bank and Jerusalem. The first questionnaire was given to pharmacists, and included 26 questions of varying styles to gain feedback relating to their level of knowledge, whilst their attitudes and beliefs were investigated via a 14-question set. Finally, several questions were dedicated to help understand what barriers exist in promoting breast cancer health awareness during patient pharmacy visits. The second questionnaire distributed amongst breast cancer patients dealt with various aspects including; attitudes towards pharmacists and the quality of information provided by them, treatment side effects following pharmacy related medication, frequency of counselling and subsequent follow-ups with pharmacists. The sample population involved in this study included 200 pharmacists and 200 breast cancer patients. The median knowledge score was rated at 69.2% with an IQR score of 15.2%. Multivariate logistic regression analysis highlighted that male pharmacists compared to females scored an OR of 0.21 (95% Cl of 0.10-0.44) and scored at least 50% in the knowledge test. Further details as to the related associations are given in Table 4. During the course of the study, pharmacists were found to foster positive attitudes towards breast cancer and also campaigns aimed at promoting breast cancer awareness. Of the patients surveyed, 180 (90%) of them regarded the attitudes they experienced as pharmacies as friendly and engaged, whilst 135 (67.5%) highly regarded the quality of information provided by their local pharmacy as clear and bespoke towards their needs.

Finally, there still exists a need for supplementary studies to advance our understanding of how best to integrate pharmacists into existing healthcare provision units who currently work with breast cancer care patients.

#### **Keywords:**

Pharmacists, Breast Cancer, Counseling, Palestine, Knowledge, Patients, Awareness, Signs and symptoms, Screening, Health service **Chapter One** 

Introduction

#### 1.1 Background.

Cancer is a lethal disease that claimed 8.2 million lives in 2012 (Ferlay et al., 2015; Fitzmaurice et al., 2015). Today, there are more than 14.1 million people living with cancer around the world. This number is expected to continue growing (Baijal & Periyakoil, 2014). Among all forms of cancer, breast cancer is the most prevalent cancer among women, and has accounted for 33% of all cancers in 2015 (Amro et al., 2018; Ganz & Goodwin, 2015; Kachroo, 2006). According to 2012 estimates, around 1.8 million women were living with breast cancer around the world (Fitzmaurice et al., 2015). Breast cancer is the leading cause of mortality among women around the world (DeSantis et al., 2015). That also applies to Palestine; as this type of cancer is the most common and a major cause of death among Palestinian women (Abu-Rmeileh et al., 2016). Unfortunately, it is usually discovered during its later stages (Abu-Rmeileh et al., 2016; Amro et al., 2018; DeSantis et al., 2015; Haddad, 2018). Also, it is estimated that 1 out of every 200 women are likely to develop breast cancer under the age of 40 years old (A. L. Jones, 2006). It can be argued that early discovery of the disease boosts survival rate (Wang, 2017). Whilst early screening, detection, and treatment might save the breast and improve the chances of full recovery (Wang, 2017). Despite the initiatives to screen for breast cancer, many patients show up for the first time to medical centers with advanced stages of breast cancer. This indicates a need for increased breast cancer awareness among women in addition to healthcare providers (Haddad, 2018). Lack of interest relating to breast cancer screening may be attributed to costs, lack of awareness of the benefits and importance of early-screening, the unavailability of tools, and potentially cultural taboos and social embarrassment due to the screening methods used (Alexandraki & Mooradian, 2010; Austin, Ahmad, McNally, & Stewart, 2002; Azaiza & Cohen, 2006; Fan et al., 2014). It can be noted that after detection, many modalities are available for treatment, which usually takes a prolonged time, however without counselling and commitment, this therapy might fail to yield positive results as expected (Calip et al., 2017).

Pharmacists have expert knowledge in the field of medication and prescriptions, and their primary duty is to ensure the right use of them. Pharmacists are also expected to counsel and educate their patients on how to make the best use of their received medications (Luisetto, Carini, Bologna, & Nili-Ahmadabadi, 2015). In addition to their expertise in drug development (Assali, Shawahna, Dayyeh, Shareef, & Alhimony, 2018; Chaves, Shawahna, Jacob, Scherrmann, & Declèves, 2014; Declèves et al., 2011; Fritz-French, Shawahna, Ward, Maroun, & Tyor, 2014; N. Jaradat et al., 2020; Kortejärvi et al., 2014, 2019; Kortejärvi et al., 2010; Shawahna, 2015, 2016, 2019b; Shawahna, Declèves, & Scherrmann, 2013; R. Shawahna, K. Ganeshamoorthy, et al., 2017; Shawahna & Rahman, 2011; Shawahna, Uchida, et al., 2011; Shawahna, Zyoud, et al., 2016; Shawahna, Zyoud, Haj-Yahia, & Taya, 2021; Shawahna, Zyoud, et al., 2018; Shawahna, Zyoud, Naseef, Muwafi, & Matar, 2021; A. Zyoud et al., 2016), rational use of medications (Shawahna, 2017, 2018, 2019a, 2020c; Shawahna, Abbas, & Ghanem, 2019; Shawahna, Abdelfattah, Shafei, & Ruzzeh, 2020; Shawahna & Abdelhaq, 2020a, 2020b; Shawahna, Al-Rjoub, et al., 2016; R. Shawahna, A. Atrash, et al., 2017a, 2017b; Shawahna, Debay, & Nisar Ur, 2013; R. Shawahna, B. Fahed, et al., 2017; Shawahna, Haddad, et al., 2016; Shawahna & Hamdan, 2017; Shawahna, Hattab, Al-Shafei, & Tab'ouni, 2020; Shawahna & Jaber, 2020a; R. Shawahna, M. Khaskiyyi, et al., 2017; Shawahna, Masri, et al., 2016; Shawahna et al., 2012; Shawahna, Odeh, & Jawabreh, 2019; Shawahna, Rahman, et al., 2011, 2013; Shawahna, Samaro, & Ahmad, 2021; Shawahna, Zyoud, et al., 2020), alternative therapeutic options (N. A. Jaradat, Shawahna, Eid, et al., 2016; N. A. Jaradat, Shawahna, Hussein, & Al-Lahham, 2016; N. A. Jaradat, Zaid, Abuzant, & Shawahna, 2016; Shawahna, 2020b, 2020d, 2020e; Shawahna & Al-Atrash, 2019; Shawahna, Batta, Asa'ad, Jomaah, & Abdelhaq, 2021; Shawahna & Jaber, 2020b; Shawahna & Jaradat, 2017; Shawahna, Qiblawi, & Ghanayem, 2018; Shawahna, Shanti, et al., 2018; Shawahna & Taha, 2017; Shraim et al., 2017; A. H. Zyoud, Saleh, Helal, Shawahna, & Hilal, 2018), present-day pharmacists are now willing to expand the roles they play in caring for patients (Tutt, Thornley, Chen, & Anderson, 2018). The role of a pharmacist in the modern era goes beyond merely dispensing medications. Today, pharmacists are expected to play a greater role in patient-centered care (Declèves et al., 2011; Kortejärvi et al., 2010; Schnipper et al., 2006; Shawahna & Rahman, 2011). Pharmacists have grown as the most accessible and trusted healthcare providers due to their being accessible in their pharmacies scattered throughout various locations within the community, they also have extended working hours, and provide free counselling services to patients (Luisetto et al., 2015). Likewise, as

pharmacists frequently interact with women, they can play a pivotal role in increasing awareness of breast cancer, in addition to counsel women on the availability of tools to screen for breast cancer, and educate patients on the right ways of using their medications relating to this disease. Pharmacists can also screen customers for proper adherence to medications, adverse sideeffects, as well as potential drug-drug, drug-food and drug-herb interactions (Shawahna, 2020a; Shawahna, Abbas, et al., 2019; R. Shawahna, A. Atrash, et al., 2017b; Shawahna et al., 2015; Shawahna, Hroub, et al., 2016; Shawahna, Masri, et al., 2016; Shawahna, Rahman, et al., 2011; Shawahna & Taha, 2017; Shraim et al., 2017). Another important issue worthy of enhanced screening is breast cancer prevalence in younger women who belong to the child-bearing age group (Birand, Boşnak, Diker, Abdikarim, & Başgut, 2019; Felton, van Londen, & Marcum, 2016; Hugtenburg et al., 2018; Partridge & Ruddy, 2007; Ribnikar et al., 2015; Tutt et al., 2018).

#### **1.2 Gaps in existing research.**

In Palestine, little is known of the existing attitudes, beliefs, and knowledge of community pharmacists relating to breast cancer. Similarly, little is known on the willingness and degree of involvement of community pharmacists in promoting breast health. Also, there is limited knowledge relating to Palestinian breast cancer patients. Whilst to the best of our knowledge, this will be the first academic study to be conducted among pharmacists and breast cancer patients alike in Palestine.

#### 1.3 Why this study needs to be conducted.

According to the information obtained during the literature review, there were little to no published reports or scientific papers that had adequately addressed the principles of beliefs, knowledge and barriers faced by community pharmacists or patients relating to breast cancer health promotion.

Hence, this study focusses on these three main areas, by gathering data from community pharmacists and breast cancer patients. This research approach hopes to shed light on the development of the role as a pharmacist, in addition to supporting further scientific research by way of sharing authentic data, and by implementation of the conclusions made in this study resulting from analysis of the current status-quo.

#### **1.4 Rationale behind this study.**

In Palestine, few studies have been conducted on the subject of breast cancer treatment; whilst even fewer have focused on the role of pharmacists as part of a wider medical network in a bid to eliminate breast cancer. Besides being a novel research area in Palestine, this subject also touches on the sensitive issue of breast cancer treatment and the integration of pharmacists within a holistic treatment plan. In short, the study aims to form a fresh perspective for this particular area of study, and contribute to enhanced academic knowledge in this field, leading to greater awareness and development in our communities.

The research intention also attempts to identify pharmacists' attitudes on breast cancer health promotion as a form of breast cancer prevention, their relative level of knowledge in this area, and finally what barriers they face during the treatment implementation phase in conjunction with other specialists.

#### 1.5 Scope of study

As this is the first study of its kind to be conducted among both pharmacists and breast cancer patients in Palestine. The study encompasses three key areas which are; attitudes, knowledge and barriers relating to the aforementioned stakeholders.

#### **1.6 Significance of this study.**

This study expects to shed light on the degree of involvement of community pharmacists in breast cancer health promotion activities in Palestine. The study also aims to determine the attitudes of community pharmacists and their subsequent involvement in breast cancer health promotion, to assess their knowledge, and to measure their interest in receiving continuous education/training. Also, it is important to determine what perceived barriers exist regarding the inclusion of breast cancer health promotion activities in their day to day work routines.

This study should expose whether or not some interventions are needed to increase the involvement of community pharmacists in breast cancer health promotion activities in Palestine. This study analyses in detail the needs and interests of Palestinian pharmacists when performing counselling activities during which they promote healthy practices relating to breast cancer prevention. From a knowledge perspective, the findings of the study highlighted that pharmacists lacked specialist knowledge in the field of breast cancer. Therefore, implications as a result of this study include proposed policy modifications and an enhanced focus on issues relating to breast cancer within key responsible organisations such as the Ministry of Health, the Palestine Pharmacists Syndicate and universities offering specialised programmes in this field. Furthermore, targeted training sessions and breast cancer awareness pamphlet initiatives for pharmacists have the potential to greatly enhance both knowledge and high-quality treatment delivery within medical communities on a national scale.

The study findings also brought to light the barriers that pharmacists face regarding staff management, customer care and financial limitations they experienced. Likewise, the provision of breast cancer treatment services in their clinic offerings were found to be hindered by either the lack of staff trained to deal with such matters, and limited financial support. Therefore, various policy mechanisms and budget enhancement strategies will be explored as a means to minimise such barriers.

#### 1.8 objective

This study aims to further explore the existing level of knowledge among pharmacists in Palestine involved in breast cancer care, in addition to understanding their tendency and willingness to contribute to breast cancer medication plans. Furthermore, the study will shed light on the existing capabilities of pharmacists and what avenues they take to enhance their knowledge of breast cancer treatment

# **Chapter Two**

**Literature Review** 

#### 2.1 Chemotherapy and the pharmacist's role:

A study was conducted in Malaysia on the pharmacist's role where chemotherapy treatment is concerned and the subsequent counselling of breast cancer patients on the various treatment options available in addition to the potential side-effects. During the above study, 162 patients were assessed who had been exposed to chemotherapy during the period July 2013 to February 2014 in a government hospital. The study set the stage for pharmacists to communicate with approximately half of those patients, whilst the rest of them were kept without any access to communication with the pharmacists. Finally, the study found that the patients who were able to interact the most with the pharmacists exhibited less anxiety and a better psychological state (Periasamy et al., 2017).

Crespo conducted a study in which she made the pharmacists consult with 112 breast cancer patients who had received the first course of chemotherapy treatment. Pharmacists were then required to answer the patients' questions either face to face or via telephone from the 3<sup>rd</sup> to 7<sup>th</sup> day after starting treatment. They then provided them with sound information concerning their medication. Post-consultation, the study asked the patients to answer a 20 question survey which evaluated the positive effect of their communication with their respective pharmacists. The study concluded that 94.7% of patients were either "very satisfied" or "satisfied" with their consultation experience and that the pharmacists had answered around 92.9% of their questions. The study concluded that patients were as a consequence able to

deal with their prescriptions in a more manageable way, and the pharmacists were allowed to thus continue contact with the patients as appropriate to continue in their supporting function (Crespo & Tyszka, 2017).

In another study in Japan, resulting treatment side-effects were either minimised or improved in approximately half of the patients receiving chemotherapy as a result of being counselled by pharmacists (Terada, 2016). The study recommended an increase in patient-pharmacist communication to improve the health related outcomes of the chemotherapy. Similarly, the quality of life of the counselled breast cancer patients was said to have improved due to such interactions.

#### **2.2 Endocrine therapy and the pharmacist's role:**

A study from Germany made reference to the role of both physicians and pharmacists in increasing adherence to tamoxifen treatment of breast cancer patients. This study identified that pharmacists played a minimal role in increasing adherence to tamoxifen treatment, where the pharmacists surveyed did not consider themselves a vital step of the treatment approach. Likewise, a key recommendation of the study included a call for greater pharmacist inclusion on this matter (Schulz et al., 2019).

Another study was performed in Canada on female breast cancer patients aged 18 years and over who had been taking tamoxifen for at least a 5 year period. The study divided participants into two groups, the first group consisted of adherents to treatment albeit with problems with maintaining routine. The other group included non-adherents to treatment. Both of the two groups needed someone to advise them, where the pharmacists were seen to play a major role in this regard, however they either didn't have enough professional information or enough experience in hormonal therapy to assist breast cancer patients adequately. Thus, they faced major barriers in implementing the desired outcomes. The study concluded that the pharmacists should therefore enhance their knowledge and undergo specialist training to be more effective in this regard (Humphries et al., 2018).

With reference to the implementation of novel breast cancer treatments administered by hospitals in Japan, researchers have found pharmacists can indeed play a pivotal role in the safe monitoring of patients undergoing such treatments. One such example includes a patient who was found to suffer from severe side-effects as a result of taking Everolimus prescriptions during a consultation with a local pharmacist, the patient followed advice given by the pharmacist and subsequently ceased the course of medication. This side-effect was discovered as a result of the pharmacist keeping in touch with the patient by telephone for around 15 days due to her living in a remote location far from the pharmacy, where the pharmacist followed up her situation by asking her about her health and enquiring if she faced any issues surrounding her medication. This study shows the important role that can be played by pharmacists if they are adequately included in both medication and treatment plans (Yokoyama et al., 2017).

# 2.3 How the pharmacist plays a role in increasing patient awareness and promoting recuperation:

A study performed in Nigeria on 31 breast cancer patients with a median age of 51 years (83% Christians and 17% Muslims) sought to determine the main reason why patients were often diagnosed during the late stages of breast cancer development and likewise experienced delayed prescription of the required medication. Thus, it was discovered that the patients were lacking in knowledge about this disease and needed a medical professional to provide advice more frequently as a supplement to traditional medical services available to the public. This again highlights the important role that pharmacists play in the community concerning this disease (Pruitt et al., 2015).

In Japan, 93 female patients (mean age of 47.3 years old) who were diagnosed with breast cancer at both different ages and stages were examined in detail. The objective of the study was to identify and minimise the effects of five factors which can negatively affect the patients' quality of life. Whilst according to a previous study, these factors include the amount of food consumption, prescription side-effects, fatigue, future perspectives and psychological state. The study requested that the pharmacists counsel patients both post-surgery and prior to chemotherapy. They found an increase in patient quality of life after such counselling, which confirms the importance of pharmacist inclusion at this stage in the treatment cycle (Kawaguchi et al., 2012).

Another study in Japan investigated the use of questionnaires targeted at breast cancer patients. Where patients were asked questions about their communication experience with pharmacists prior to beginning chemotherapy treatment. The questionnaire sought to understand pharmacist attitudes, the quality of information they provided, their explanation concerning potential side-effects of treatment/medication, the frequency of counselling needed before starting chemotherapy, the counselling cost, and follow-up procedures with the pharmacist after starting chemotherapy. They found that patients preferred to interact with friendly pharmacists; who had a sound knowledge of prescription drugs and their side-effects, and specifically held a preference for pharmacists who were not only interested in their individual cases but were also willing to interact at no additional cost (Kawaguchi et al., 2014).

Jones et al contributed greatly to knowledge in this field as a result of their clinical outcomes and pharmacist-managed anticoagulation service for breast cancer patients (K. L. Jones et al., 2012). In this study, a retrospective review was undertaken of 145 patients with breast cancer who had received warfarin therapy for venous thromboembolism delivered and monitored by pharmacists. The study reinforces the concept that pharmacists play a critical role in caring for patients with breast cancer.

Barbour commented on the role of pharmacists in caring for veteren breast cancer patients who had undergone multiple treatments (Barbour, 2008). In her commentary, Barbour stressed on the multiple roles that pharmacists can play in helping patients with breast cancer to achieve the best possible therapeutic outcomes thereby reducing the impact of negative or unintended side-effects during treatment. Other roles played by pharmacists included educating patients, development of guidelines for managing adverse events, ensuring proper laboratory tests, medication reconciliation services, and ensuring adherence to therapy.

A further study of interest includes 39 breast cancer patients who started chemotherapy in Gifu Municipal Hospital. They were asked to answer a survey to determine their respective quality of life after their first, second and third courses of chemotherapy. In the study, 20 patients were allowed to contact a pharmacist for advice prior to starting chemotherapy, and 19 had no contact with pharmacists. The study found that the quality of life for the first group was more positive and that they experienced reduced negative side-effects, specially nausea, and this again confirms the important role of pharmacists in treatment (Tanaka et al., 2018).

#### 2.4 Limited knowledge that pharmacists have about breast cancer:

In Malaysia, in the period from May to September 2010, 35-community pharmacies participated in a questionnaire that included various questiontypes. The study aimed to evaluate the level of knowledge of the pharmacists surveyed. After analysing the results, they found only 11% of the pharmacists had answered the questions relating to knowledge correctly. Whereas 56% correctly answered questions relating to disease risk factors and screening. All of the pharmacists included in this study shared the same views as to why they did not administer breast cancer medication. Namely, they reported that they lacked sufficient information relating to the appropriate medicine(s), and likewise didn't feel they had enough training nor enough time. Whilst 94.3% of them stressed the important role pharmacies should play in breast cancer medication delivery to patients. Consequently, recommendations as a result of the study included increasing the level of knowledge amongst pharmacy practitioners and the provision of adequate training to those working in the field (Beshir & Hanipah, 2012).

Kofi Boamah Mensah conducted a systematic review of 1538 articles relating to pharmacist knowledge about breast cancer between the years 2005 and 2017. Upon in-depth analysis of these articles, he found a knowledge gap in practitioner identification of the signs and symptoms of breast cancer, including the correct application and screening methodology for breast cancer diagnosis (Mensah, Oosthuizen, & Bonsu, 2018).

In Qatar, research was undertaken in order to determine the role played by pharmacists in giving information to and counselling of the community regarding breast cancer (El Hajj & Hamid, 2011). The study provided evidence of low pharmacist involvement in breast cancer health promotion activities. Despite this low involvement however, pharmacists were motivated to educate patients on matters concerning breast cancer. Albeit the realisation of this role was obstructed by the lack of appropriate knowledge concerning breast cancer.

In Japan in 2014, a study was performed to determine the level of knowledge and experience of pharmacists on breast cancer. Participants were asked to complete a questionnaire. The study population was 300, all of whom were contacted either by traditional mail or email to support survey response. The study highlighted a lack of pharmacist knowledge. Where only 6-10% of all pharmacists believed they had adequate training in the fields of oncology or chemotherapy, whilst 81% of them were enrolled in at least one program to continue learning lasting for a period of two years or more. Likewise, 54% felt able to dispense appropriate medications and 40% felt they had adequate knowledge to give information to patients about chemotherapy. Therefore, pharmacists should be given more training and more education to increase their effectiveness in medication prescription and dispensing activities (Suzuki et al., 2017).

Ayoub carried out a study in Jordan that involved distributing questionnaires amongst 1000 community pharmacists. The study showed half of pharmacists had inadequate knowledge, and the other half demonstrated acceptable knowledge about breast cancer. Results showed that 60% of the participants had poor knowledge of the appropriate screening programs. It also showed that 63% of those surveyed reported 'not having enough time' as a major barrier to progression in this regard. Whilst 57.1% noted the loss of privacy is another one. Finally, 56.2% admitted that their lack of knowledge was also a barrier. The study found no correlation between the age of pharmacists and their respective level of knowledge of the subject; however it reaffirmed a strong relationship between pharmacists' level of knowledge and their attitudes towards their roles (Ayoub, Nuseir, Othman, & Abu Alkishik, 2016). Another study includes that where 300-questionnaires were distributed among community pharmacists with a survey intent to understand 'knowledge of risk factors', 'knowledge of signs and symptoms', 'perceived barriers' and 'knowledge of screening programs'. The resultant findings confirmed that 68.2% of respondents said that the main barrier was their respective lack of time. The study found their level of knowledge in all areas of the subject to be poor. However, the survey highlighted the overall attitude of respondents to be both positive and favorable (AL-Behadily & Al-Tukmagi, 2017).

Upon umbrella review of this matter, with the aim of understanding the role pharmacists play in breast cancer treatment. It found that pharmacists can potentially play a highly effective role when dispensing medication, however they require prerequisite knowledge and skills to deliver this role efficiently (San-Juan-Rodriguez et al., 2018).

#### 2.5 Roles of pharmacists in hospitals:

Dorris and Jones carried out a study about Everolimus and the role of pharmacists in breast cancer treatment. Pharmacists were deemed to play a very important role in treatment by determining the side-effects, interactions, and effective dose adjustment protocols. This study reflected on the improvement measures needed for effective breast cancer treatment (Dorris III & Jones, 2014).

Another study was conducted in a hospital based in Brazil, where they reviewed 1,874 prescriptions given by pharmacists to 248 breast cancer patients. In this

study, the presence of least one error per 11.5% of prescriptions was discovered, counting towards 283 errors. Major errors thus made the medications unsafe and increased the risk of harmful drug-drug interactions. In this study, they discovered the important role pharmacists play, especially if they had sufficient knowledge to intercept such errors (Ferracini, Rodrigues, De Barros, Derchain, & Mazzola, 2018).

The School of Pharmaceutical Sciences conducted a study of 40 breast cancer patients. These patients were females; whilst half of them were between 50-60 years old. Also, 47.4% of the patients had received a secondary education. Patients were divided into two groups. Where one communicated with pharmacists before undergoing chemotherapy, and the other group did not. Patients were asked to answer a questionnaire after the second and sixth cycle of their chemotherapy. This study concluded that the patients who communicated with pharmacists had a better understanding of their treatment goals than those who did not. Also, they were able to describe the treatment information given to them during the six cycles of treatment, highlighting the important role pharmacists play in the pre-chemotherapy counselling stage (Dang, Amiruddin, Lai, Low, & Chan, 2017).

#### 2.6 Pharmacists and the detection of breast cancer:

Virginia Commonwealth University conducted a study of six pharmacy clinics and subsequently contacted 137 females, the youngest being 18 years old. In this study, pharmacists were provided with supplementary education and training on breast self-examination (BSE), clinical breast examination

(CBE), and mammography. Adherence to monthly BSEs was then seen to increase from 31% to 56% for all participants during the 6-months following the program. Pharmacists then asked the women questions to identify the level of risk that the women feel exposed to. After quantification of the risk, the women were contacted to define a standard means of communication for the next 5 year period, and to provide them with updates as required. The study proved that pharmacists can help the community and play a big role in the treatment of breast cancer (Giles et al., 2001).

Another study includes that conducted by The Nebraska Health Organisation who asked pharmacists to help detect the occurrence of breast cancer in women. They began working with 91 pharmacies, however only 21 continued to participate until the end of the project. Those 21 pharmacies played a huge role in referring patients to the necessary health organisations, assisting with 114 patient-doctor referrals. This study showed that we should continue to involve pharmacists in the referral stage and that excellent outcomes can result from such participation (McGuire, Leypoldt, Narducci, & Ward, 2007).

In the USA, a study involving the analysis of 1187 questionnaires was undertaken and distributed to pharmacists. In this study, pharmacists declared that they had been frequently contacting people regarding the signs and symptoms they were experiencing (at least once a month). According to this study, 60,000 patients were diagnosed with primary symptoms of breast cancer throughout the 1000 pharmacies involved in the study in just a single year. This study confirms the importance of the pharmacy clinic and the important role of the pharmacist in the detection of breast cancer (Lum, McWaters, & Mergener, 1989).

# **Chapter Three**

# Methodology

#### 3.1 Study design

This study was conducted using a cross-sectional design approach whereby two separate questionnaires were utilised during the study. The questionnaires targeted the following participants; firstly, pharmacists who work throughout the medical sector and secondly, patients who routinely visit hospitals for follow-ups.

A major part of this study addressed pharmacists specifically. Prior to distributing the questionnaires, the researcher provided the recipient pharmacists with the relevant background information and explanation about the purpose of the research before commencing further. The questionnaire included various types of questions: both open and close-ended ones. These questions were developed in a way that explored the degree of involvement of the surveyed pharmacists in breast cancer health promotion activities in Palestine. Also, the questionnaire sought to explore the attitudes of pharmacists towards involvement in such activities. The questions also assessed their knowledge, measured their interest in receiving continuous education/training and aimed to determine any perceived barriers relating to the inclusion of breast cancer health promotion activities in their daily practice.

Also, patients received a two-part questionnaire, the first section collecting their general information and the other exploring their preferences and experiences with pharmacists.

#### 3.2 Sample size

The study population included Palestinian registered pharmacists who were licensed by the Ministry of Health to practice pharmacy. According to a previous study, approximately 6,000 pharmacists are licensed to practice pharmacy in Palestine (Ramzi Shawahna et al., 2017). To calculate the required sample size, the researchers used (<u>www.raosoft.com</u>), an online sample size calculator.

For a population of 6,000 pharmacists, the sample size was chosen to be 362; using a 95% confidence interval (C.I.) and a default margin of error of 5%.

Since limited information was available surrounding the exact number of patients in Palestine suffering from breast cancer. The sample population for the patient questionnaire participants was based on statistics from 2018, recorded as an incidence rate of 33 per 100,000 population (AlWaheidi, 2019). The sample size was calculated based on a population of 2,000 patients with a confidence level of 90% (C.I.) with a margin of error of 5%. Hence, a patient sample size of 239 patients has been chosen for this study.

Subsequently, the researchers approached the pharmacists involved in the study in person and they were asked for permission to take part in the study. The researchers explained the objectives of the study to potential participants and obtained their verbal consent to complete and answer the questionnaire. In the case pharmacists did not have time at the first visit, they were requested to provide timing for another appointment to complete the test. It should be noted that pharmacy assistants, students and trainees
who were not licensed at the time of the study were excluded from participating in this study.

This study involved a sample of approximately 400 pharmacists, located throughout Palestine, however, only 200 pharmacists continued to the end. The participants worked in either hospital pharmacies, community pharmacies, or worked as employees in health organisation owned pharmacies. The sample population involved both genders, and pharmacists of different academic degree backgrounds and different age groups were included.

A sample of 210 patients with breast cancer were originally included in this study, only 200 continued until the end. They were patients with different stages of breast cancer. They were approached during check-up visits to medical centres. The participants included patients who were already diagnosed with breast cancer, whilst some were undergoing treatment and some had fully recovered and were just completing follow-up checks in the hospitals. Patients represented different age groups, had varying educational levels and hailed from different socio-economic backgrounds. Some were employed and others were housewives. The sample population was approached in coordination with the Ministry of Health and the competent authorities who govern the hospitals that specialise in this kind of cancer treatment in Palestine.

## 3.3 The study tool

The questionnaire included different types of questions, based on previous studies of a similar nature conducted elsewhere (El Hajj & Hamid, 2011; Kawaguchi et al., 2014).

The pharmacist questionnaire included a set of distributed questions as per the following:

- A. Personal information including age, gender, marital status, etc. Educational background, number of years employed as a pharmacist, enrollment in educational programmes relating to breast cancer, approximate number of patients suffering from breast cancer seen per month, perceived knowledge of breast cancer related issues, working hours per week, percentage of female patients served, number of pharmacists working per shift, speed of response to customer enquiries relating to breast cancer signs and symptoms, counselling experience and frequency of service to patients, frequency of activity relating to breast cancer screening and early detection, frequency of referral for patients needing special screening tests.
- B. Frequency of communication with specific patient-types: This part of the questionnaire aimed to identify if the pharmacist receives breast cancer patients at the pharmacy, or potential patients at risk. The second part of the questionnaire included a 26-question section targeted at collecting information relating to prevalence, risk factors, signs and symptoms, screening methods, in addition to general questions relating

to breast cancer treatment. Each question has a multiple choice answer set (i.e. true, false, don't know).

C. Breast cancer knowledge items: This part aimed to determine the level of knowledge the pharmacists had about breast cancer, the risk factors, signs and symptoms of the disease, and the relevant treatment and medication course of action.

The third section featured 14 questions relating to participant attitudes and beliefs surrounding the provision of health promotion advice to breast cancer patients. The answer set available included either 'disagree, neutral, agree'.

- D. The extent of agreement between pharmacists about providing breast cancer health promotion in pharmacies. In this part of the questionnaire, pharmacists verbalised if they agree to be part of breast cancer patient medical plans, and if they accept to support activities relating to the detection of breast cancer in addition to providing follow-up counselling to patients. Finally,
- E. Participants' perceived barriers for integrating Breast Cancer health promotion: This section queried the main barriers that hinder pharmacists from becoming an important part of the holistic breast cancer medical team.

The fourth section proposed 9 barriers to providing adequate breast cancer health promotion to patients who frequent pharmacies. The answer set for these questions included either 'disagree, netural, agree'. The patients' questionnaire mainly focussed on two parts. The first captured socio-economic and general personal information. The second part focussed on patient impressions of the pharmacist and the experience they faced in addition to the quality of information received and frequency of counselling sessions / follow-up, etc. The patients were interviewed face-to-face by the supervising researcher and the subsequent data filed for further analysis.

## **Statistical analysis**

Statistical analysis was performed on the data collected during the research phase using IBM SPSS v.21.0. software. Also, a Shapiro-Wilk test was adapted to assess the data set including the normality of distribution. The data was then expressed using both median and interquartile (IQR) parameters, where both Chi-square ( $\chi$ 2) and Spearman correlation techniques were used to sort variables found in the data into separate categories. This then allowed for the identification of predictors of good knowledge using multivariate logistic regression techniques. Statistical significance was rated at a p-value of <0.05.

## Ethics approval and consent to participate

This research abided by the Declaration of Helsinki principles as adopted by An-Najah National University. The Institutional Review Board (IRB) at the university fully approved the study prior to commencement. Likewise, the participants in this study verbally consented prior to engaging in the study activities and were given the opportunity to withdraw their participation at any time should they have wished to.

## **3.4 Reliability and psychometric evaluation**

A test-retest method was employed upon analysis of the questionnaire results to assess the consistency of pharmacist respondents' answers 30 minutes after registering their first answer. The questionnaire was thus distributed to 20 pharmacists and the results were analysed using a Pearson's correlation technique. Also, The question-set of the questionnaire was assessed using a Cronbach alpha test to validate their internal consistency.

By using the aforementioned test-retest method, the scores could be adequately assessed. The questionnaires were handed out to 20 pharmacists who did not form part of the study. Firstly, they were asked to complete it, and after an interval of half an hour, they were asked to complete it again. The results were analysed using Pearson's correlation technique. A priori was set on a sensible correlation coefficient of > 0.80 and for this study it was 0.90 (95% CI = 0.91-0.99). The consistency of the items in the questionnaire were envisaged to fall within the range 0.70-0.95 (Tavakol & Dennick, 2011). According to our study, the actual result was logged at 0.87, which is acceptable and reflects adequate consistency. **Chapter Four** 

Results

## Score stability and internal consistency rating

A pilot test activity was carried out which verified that both questionnaires exhibited stable scores over a fixed period of time as per Pearson's correlation technique and corresponded to a respective coefficient of >90%(95% C.I. = 0.91-0.99). The questionnaire questions were also found to be internally consistent and exhibited an 87% score according to Cronbach's alpha test.

The number of pharmacists who completed the questionnaire was 200 distributed all around Palestine. However, 400 pharmacists were initially invited to participate in the questionnaire activity, and only 200 accepted and completed it. This corresponds to a response rate of 50%.

Table 1 includes an explanation of the demographic data and experience of the pharmacists who answered the questionnaire. The demographic section shows both genders covered in the study with a percentage of 33.5% for males and 66.5% for females participating respectively. Pharmacists aged younger than 30 years formed 50% of the study population and the remaining were either 30 or over the age of 30. Also, 63% of the population were either married or previously married. Pharmacists had different educational degrees, 79% of them had a BSc in Pharmacy, 9% had a Pharm.D, and 12% had a postgraduate pharmacy qualification. Furthermore, 76% of them are graduates from Palestinian institutions. Whilst 43% of them had less than 5 years' work experience. Most of them (90%) had not attended any program relating to breast cancer. It was seen that 78.5 % of these

pharmacists had been exposed to less than three breast cancer patients per month. Whilst 59% of pharmacists evaluated their level of knowledge of breast cancer as either good or excellent. About 60% of them worked less than 40 hours per week and 60% of pharmacists saw less than 50 patients a day. The percentage of female patients was less than 20% of all patients seen by 19% of pharmacists, this can be compared with the percentage of female patients reaching >50% of all patients seen by another 17% of pharmacists. About half of them (48%) worked as lone-shift workers. Large numbers of them (70.5%) were rarely asked about breast cancer disease and (71%) were rarely counselling patients about this disease. Also, a minority of pharmacists (20.5%) often referred the patients to breast cancer centres. In addition to that, 79% of pharmacists rarely provided patients with breast cancer related educational materials or self-assessment quizzes.

Variable	Ν	%
Age (years)		
< 30	100	50.0
$\geq$ 30	100	50.0
Gender		
Male	67	33.5
Female	133	66.5
Marital status		
Never married	74	37.0
Married/divorced/widowed	126	63.0
Education		
BSc Pharmacy	158	79.0
Pharm.D	18	9.0
Postgraduate pharmacy education (MSc and PhD)	24	12.0
Place from where the academic degree was obtained		
Palestine	152	76.0
Other	48	24.0
Experience (years)		
< 5	86	43.0
5 to < 10	43	21.5
$\geq 10$	71	35.5
Attended an educational program on breast cancer		
No	180	90.0
Yes	20	10.0
Approximate number of patients with breast cancer intera	cted w	ith per
month		
< 3	157	78.5
$\geq$ 3	43	21.5
Perceived knowledge of breast cancer		
Poor-Fair	82	41.0
Good-Excellent	118	59.0
Average number of working hours per week		
< 40	80	40.0
≥ 40	120	60.0

 Table 1 Demographic & experience of the pharmacist in the study.

## Table 1 continued

Variable	Ν	%							
Average number of patients interacted with per day									
< 50	120	60.0							
$\geq$ 50	80	40.0							
Percentage of female patients visiting the pharmacy									
<20%	128	64.0							
20%-49%	38	19.0							
$\geq$ 50%	34	17.0							
Number of pharmacists working in the pharmacy at any	one shi	ft							
1	96	48.0							
> 1	104	52.0							
Respond to patient inquiries related to breast cancer war	ning sig	ns and							
symptoms and breast cancer early detection and screening tests									
Rarely	141	70.5							
Often	59	29.5							
Provide patients with advice or counseling on breast can	ncer scr	eening							
and early detection									
Rarely	142	71.0							
Often	58	29.0							
Provide patients with breast cancer educational mate	erials o	r self-							
assessment quizzes									
Rarely	158	79.0							
Often	42	21.0							
Refer patients to special breast cancer screening progra	ams org	anized							
by hospitals or cancer organizations									
Rarely	159	79.5							
Often	41	20.5							

# Pharmacists' Knowledge and Knowledge Score (KS):

The second section results were mainly about a metric termed the 'Pharmacists' Knowledge Score (KS). The knowledge-based questionnaire results were compared to model answers. According to this, each pharmacist received a total score whilst the pass score was >50. This metric was considered crucial for determining the findings of the study.

There were significant correlations (p-value < 0.05) between the knowledge score and different variables, which have been highlighted in table 2. Firstly, there was a correlation with age, this was apparent based on the higher percentage knowledge score of pharmacists who were <30 years old compared to the lower score of pharmacists who were of ages > 30 years old, respectively showing a ratio of (38.5%) to (29%). Then there was the correlation relating to gender, where this correlation showed the percentage of females having scored >50% was greater than the percentage of males; (53%) to (14.5%) respectively. Another significant correlation was the correlation relating to education, which indicated that the higher percentage of pharmacists who had a knowledge score >50% also possessed a BSc degree (50%). The study also found a correlation relating to the place of graduation, showing that pharmacists who were graduates from Palestinian universities had a percentage knowledge score of >50%. Finally, the last correlation related to experience, concluding that pharmacists who had experienced totalling more than 10 years had the highest percentage in their knowledge score equating to >50%.

Variable			Kno	Knowledge score						
			< 50	)%	≥ 50	%				
	NI	0/	NI	0/	N	0/		р-	Correlatio	<i>p</i> -
	IN	70	IN	70	IN	Ν % χ		value	n	value
Age (years)										
< 30	100	50.0	23	12	77	39	× 22 0.006		0.20	0.004
≥ 30	100	50.0	42	21	58	29	0.23	0.000	-0.20	0.004

 Table 2 Correlations between variables of pharmacists and knowledge

 score

					51					
Gender										
Male	67	33.5	38	19	29	15	26.02	0.000	0.27	0.000
Female	133	66.5	27	14	106	53	20.95	0.000	0.57	0.000
Marital status										
Never married	74	37.0	18	9	56	28				
Married/divorced /widowed	126	63.0	47	24	79	40	3.58	0.063	-0.13	0.059
Education										
BSc Pharmacy	158	79.0	58	29	100	50				
Pharm.D	18	9.0	3	2	15	8				
Postgraduate pharmacy education (MSc and PhD)	24	12.0	4	2	20	10	6.08	0.045	0.17	0.014
Place from where	the a	cadem	ic de	gree	was o	btain	ed			
Palestine	152	76.0	40	20	112	56	11.04	0.001	0.23	0.001
Other	48	24.0	25	13	23	12	11.04	0.001	-0.23	0.001
Experience (years	5)									
< 5	86	43.0	23	12	63	32				
5 to < 10	43	21.5	11	6	32	16	6.27	0.045	0.15	0.030
$\geq 10$	71	35.5	31	16	40	20				
Attended an educ	ationa	l prog	ram	on b	reast o	cance	r			
No	180	90.0	61	31	119	60	1 50	0.214	0.00	0.210
Yes	20	10.0	4	2	16	8	1.58	0.314	0.09	0.210
Approximate nur	nber o	f patie	ents v	vith <b>k</b>	oreast	canc	er inte	racted	with per mo	onth
< 3	157	78.5	49	25	108	54	0.55	0.467	0.05	0.450
≥ 3	43	21.5	16	8	27	14	0.55	0.467	-0.05	0.459
Perceived knowle	dge of	breas	t can	cer					l	
Poor-Fair	82	41.0	28	14	54	27	o <del>.</del>			0. 40.0
Good-Excellent	118	59.0	37	19	81	41	0.17	0.759	0.03	0.680
Average number	of wor	king l	ours	per	week		l			
< 40	80	40.0	26	13	54	27				
$\geq$ 40	120	60.0	39	20	81	41	0.00	1.000	0.00	1.000
Average number	of pati	ients i	ntera	cted	with <b>p</b>	ber da	av		1	
< 50	120	60.0	39	20	81	41				
≥ 50	80	40.0	26	13	54	27	0.00	1.000	0.00	1.000
			-	-						
					1			1		

## Table 2 Continued

Variable			Kno	Knowledge score						
			< 50	)%	$\geq$ 50 °	%				
	N	%	n	% N		%	χ2	p- value	Correlation	<i>p-</i> value
Percentage of fe	emale pat	ients vi	siting	g the j	pharm	acy				
<20%	128	64.0	39	20	89	45				
20%-49%	38	19.0	15	8	23	12	1.08	0.592	0.05	0.494
≥ 50%	34	17.0	11	6	23	12				
Number of pha	rmacists	workin	g in t	he ph	armac	y at a	ny one	shift		•
1	96	48.0	31	16	65	33	0.00	1 000	0.00	0.050
> 1	104	52.0	34	17	70	35	0.00 1.000		0.00	0.952
Respond to pat breast cancer ea	ient inqui arly detec	iries re tion an	lated d scr	to br eenin	east c g tests	ancer	warni	ng signs	s and sympto	ms and
Rarely	141	70.5	44	22	97	49	0.27	0.000	0.04	0 5 4 9
Often	59	29.5	21	11	38	19	0.37	0.620	-0.04	0.548
Provide patient	s with adv	vice or	couns	seling	on bre	east ca	ncer s	creening	g and early d	etection
Rarely	142	71.0	45	23	97	49	0.15	0.7.11	0.02	0.704
Often	58	29.0	20	10	38	19	0.15	0./41	-0.03	0.704
Provide patient	s with bro	east car	ncer e	educa	tional	mater	ials or	self-ass	essment quiz	zes
Rarely	158	79.0	50	25	108	54	0.05	0.711	0.04	0 (10
Often	42	21.0	15	8	27	14	0.25	0./11	-0.04	0.619
Refer patients cancer organiza	to special ations	breas	t can	cer s	creeni	ng pro	ogram	s organ	ized by hosp	itals or
Rarely	159	79.5	52	26	107	54				
Often	41	20.5	13	7	28	14	0.01	1.000	0.01	0.904

The final analysis of multivariate correlation showed that there to be a significant correlation between gender and knowledge scores with p- values equalling zero, this was evident in Table 3.

							95% C.I. for O.R.
Variable	β	S.E.	Wald	<i>p</i> -value	O.R.	Lower	Upper
Age	0.86	0.61	1.98	0.160	2.36	0.71	7.80
Gender	-1.55	0.38	17.02	0.000	0.21	0.10	0.44
Education	0.42	0.89	0.22	0.640	1.52	0.27	8.70
Place from where the academic degree was obtained	0.35	0.44	0.65	0.421	1.42	0.60	3.35
Experience	-0.15	0.52	0.08	0.782	0.87	0.31	2.42

 Table 3 Correlation between multivariate and knowledge scores.

## Pharmacists' Knowledge on Breast Cancer:

The second part of the questionnaire set highlighted the level of knowledge about breast cancer amongst pharmacists and is tabulated in table 4. A high number of pharmacists (89%) were aware that the most common type of cancer in females is breast cancer, and 78% of them recognised that the disease can potentially affect all ages. The percentage of pharmacists who knew that early screening reduces mortality was 92.5%. About 92% of the pharmacists believed that patients could use breast self-exam (BSE) techniques to detect the disease; 22% of them believed that women aged 20-40 years old should make the BSE more than once a year. While 8.5% of them answered correctly that women aged 40 years and above should schedule monthly BSEs, an annual clinical breast exam and a biannual mammogram - of which, these assumptions do not fully reflect medical truth. Lastly, 40.5% of them believed that women aged 30 years and below should make BSEs monthly. About 50% of pharmacists understood that the mammography is not painful, and 68.5% recognised that mammography techniques are safe.

## **Pharmacists' Knowledge on Risk Factors:**

The level of knowledge concerning risk factors of disease was considered adequate; 97.5% of them knew that hormone replacement therapy was one of the risks, (72.2%) of them confirmed that old age increased the risk of disease, and (64.25%) saw smoking cigarettes as another risk. (88%) believed family history also increased the proneness of disease onset, (77%) of them added that the use of contraceptives was another risk to consider. (90%) of them answered that breast-feeding posed an insignificant or no risk. Only a minority of pharmacists knew that late onset menstrual periods and breast size are other potential risk factors; results were (34%) and (31.5%) respectively.

## **Pharmacists' Knowledge of Symptoms:**

The level of knowledge regarding symptoms was also deemed adequate. Many pharmacists recognised fundamental warning signs such as; nipple discharge, painless lumps under the armpit, change of breast shape, pain and dimpled skin, whilst the respective scorings were rated as (79.5%), (65%), (85.5%) and (63%).

## **Pharmacists' Knowledge about Treatment:**

Finally, the level of knowledge amongst pharmacists regarding treatment was as follows; 46.5% of them knew the treatment of breast cancer did not affect fertility, while 58.5% of them believed that treatment was both long and painful. 59.5% of them believed that patients with positive estrogen receptors should take adjuvant endocrine therapy, and 76.5% of them saw the choice for premenopausal interval patients of adjuvant endocrine therapy was tamoxifen. (49.5%) of pharmacists believed that total mastectomy should not be performed on first stage patients.

#	Items	Correct	Answ	ered	Ansv	vered	Answ	ered did
		answer	Corre	ctly	wron	gly	not kr	now
			Ν	%	n	%	Ν	%
								%
1	Breast cancer is the most common form of cancer among women	True	178	89.0	8	4.0	14	7.0
2	Breast cancer should not be of concern for patients younger than fourteen years of age	False	156	78.0	30	15.0	14	7.0
3	Use of hormone replacement therapy is one of the risk factors for developing breast cancer	True	159	79.5	20	10.0	21	10.5
4	Late onset menstrual period is one of the risk factors for developing breast cancer	False	68	34.0	58	29.0	74	37.0
5	Nipple discharge can be a warning sign of breast cancer	True	159	79.5	19	9.5	22	11.0
6	Appropriate early screening for breast cancer reduces breast cancer mortality	True	185	92.5	5	2.5	10	5.0
7	Breast self-exam is one of the methods that are used to detect the presence of breast cancer	True	184	92.0	7	3.5	9	4.5
8	To detect the presence of breast cancer, women over the age of twenty and under the age of fourteen should do a breast self-exam at least once per year	False	44	22.0	136	68.0	20	10.0
9	To detect the presence of breast cancer, women aged 40 years and above should do a monthly breast self-exam, an annual clinical breast exam and a biannual mammogram	False	17	8.5	161	80.5	23	11.5
10	Is mammography painful	False	100	50.0	49	24.5	51	25.5
11	Is mammography safe	True	137	68.5	17	8.5	46	23.0

# Table 4 The level of knowledge for the pharmacist about breast cancer

	43							
12	BSE is recommended for women aged 35 and below and should be done	True	90	45.0	59	29.5	51	25.5
	once a month							
#	Items	Correct	Answ	ered	red Answ		Answ	ered did
		answer	Correc	ctly	wron	gly	not kr	IOW
13	Total mastectomy is the surgical option of choice for patients diagnosed	False	99	49.5	73	36.5	28	14.0
	with early stage breast cancer							
14	Patients with invasive breast cancer that is estrogen receptor positive	True	119	59.5	17	8.5	64	32.0
	should receive adjuvant endocrine therapy							
15	5 Tamoxifen is the adjuvant endocrine therapy of choice for premenopausal		153	76.5	51	25.5	32	16.0
	patients with invasive breast cancer							
16	The treatment for breast cancer is a long and painful process	True	117	58.5	35	17.5	11	5.5
17	Old age increase risk of breast cancer	True	145	72.5	34	17.0	37	18.5
18	no relation between Cigarette smoking and breast cancer	False	129	64.5	34	17.0	12	6.0
19	Family history of breast cancer Increased probability of injury:	True	176	88.0	12	6.0	12	6.0
20	Use of oral contraceptive decrease risk of breast cancer	False	154	77.0	27	13.5	19	9.5
21	no relation between size of breast and risk	False	63	31.5	102	51.0	35	17.5
22	breastfeeding increase risk of breast cancer	False	180	90.0	8	4.0	12	6.0

## Table 4 continued

			Ν	%	n	%	Ν	%
								%
23	Painless breast lump under armpit is not sign of breast cancer	False	130	65.0	32	16.0	38	19.0
24	Change in breast shape is a sign of breast cancer	True	171	85.5	15	7.5	14	7.0
25	Pain in breast region and Dimpling is a sign of breast cancer	True	126	63.0	52	26.0	22	11.0
26	Treatment of breast cancer affects fertility	False	93	46.5	35	17.5	72	36.0

## **Pharmacist Attitudes:**

Table 5 contains a summary of results to questions that showed the extent of agreement of providing breast cancer (BC) health promotion in pharmacies. Pharmacists in general (73.5%) agreed that they should be involved in BC health promotion activities in the pharmacy, and only 9% of them disagreed. 70% of these pharmacists stressed the importance of integrating BC health promotion into the daily practices of pharmacists, while 9.5% of them did not. An adequate number of pharmacists (73.5%) felt confident and prepared to provide BC health promotion, while few pharmacists (6.5%) did not feel the same way. 81% of the pharmacists found discussing breast cancer with female patients beneficial and that such dialogue can potentially save lives, while 4% did not agree to that. More than half of them considered counselling about breast cancer matters with female patients as part of their responsibility and scope, another responsibility included provision of healthcare advice and spreading awareness about the disease. Around 70% of pharmacists believed in the importance of distributing educational material about breast cancer within the pharmacy, and considered advising female patients about early screening. About 57.5% believed that there was enough evidence to suggest that pharmacists can influence patients to adopt breast cancer screening practices. More than half of them were convinced that the patients appreciate counselling sessions relating to screening and early detection of this disease. 64% of pharmacists were convinced that the time spent in counselling patients about breast cancer was effective and useful. Finally, 71.5% agreed to the possession of some form of educational material related to breast cancer as a good initiative, and were more likely to provide BC health promotion to their female patients if such material was readily available.

Table 5 Pharmacists	' beliefs about	t providing	medical advice	regarding	breast cancer
---------------------	-----------------	-------------	----------------	-----------	---------------

#	Items	Agree		Disa	gree	Neutral	
		Ν	%	Ν	%	Ν	%
1	I should be involved in breast cancer health promotion activities in the pharmacy	147	73.5	18	9.0	35	17.5
2	Integrating breast cancer health promotion into my daily practice as a community pharmacist is important	140	70.0	19	9.5	41	20.5
3	feel confident and prepared to provide breast cancer health promotion	147	73.5	13	6.5	40	20.0
4	Discussing breast cancer awareness with my female patients in the pharmacy is beneficial and can save their lives	162	81.0	8	4.0	30	15.0
5	Providing breast cancer counseling to my female patients in the pharmacy is my responsibility as a pharmacist	119	59.5	39	19. 5	41	20.5
6	Distributing breast cancer educational materials is important in the pharmacy	146	73.0	14	7.0	40	20.0
7	It is important to discuss breast cancer with my female patients to encourage breast cancer early screening and detection	151	75.5	7	3.5	42	21.0
8	There is enough evidence to suggest that the pharmacist can influence patients to adopt breast cancer screening practices	117	58.5	27	13. 5	56	28.0
9	Inviting healthcare professionals to provide breast cancer education to the female patients in the pharmacy is important	115	57.5	29	14. 5	56	28.0
10	Providing breast cancer counseling to my patients can improve my professional state and increase my professional satisfaction	152	76.0	9	4.5	39	19.5
11	Providing breast cancer counseling is an effective use of my time	129	64.5	11	5.5	60	30.0

	47						
12	If I have access to patient education materials related to breast cancer I am	143	71.5	12	6.0	45	22.5
	more likely to provide breast cancer health promotion to my female patients						
13	Patients would like me as a pharmacist to counsel them on breast cancer	113	56.5	29	14.	58	29.0
	screening and early detection				5		
14	Patients appreciate my effort as a pharmacist to counsel them on breast	120	60.0	21	10.	59	29.5
	cancer				5		

## **Pharmacists' and Barriers:**

Table 6 highlights the reasons why pharmacists were not previously active in the treatment of breast cancer. The main barriers were; firstly, the number of employees were simply not enough to provide such services (68%). Secondly, social customs and taboos must be taken into account; because counselling could be misunderstood as an insult or personal invasion of space (66%). Finally, the fact that there was no financial compensation for providing this service formed a percentage of (65%).

## Table 6The barriers defined by participants that prevent pharmacists from being included in the breast cancer

## health promotion

#	Barriers	High		Medium		Low	
		n	%	n	%	Ν	%
1	What is your level of interest in providing breast cancer health promotion to your female patients?	124	62.0	57	28.5	19	9.5
2	What is your level of comfort in providing breast cancer health promotion to your female patients?	109	54.5	66	33.0	25	12.5
3	What is your level of interest in receiving breast cancer continuous education?	82	41.0	99	49.5	19	9.5
4	There are not enough personnel	136	68.0	30	15.0	34	17.0
5	I do not have enough time	122	61.0	60	30.0	18	9.0
6	I do not have enough space	124	62.0	49	24.5	27	13.5
7	I do not have breast cancer educational materials	95	47.5	63	31.5	42	21.0
8	Providing breast cancer health promotion does not interest me	88	44.0	7	3.5	103	51.5
9	As a pharmacist, I am not supposed to provide breast cancer health promotion	88	44.0	16	8.0	96	48.0
10	The pharmacy manager does not support my role as a breast cancer health promoter	83	41.5	24	12.0	93	46.5
11	I do not have adequate knowledge or skills in this area	115	57.5	29	14.5	56	28.0
12	Patients do not ask for breast cancer health promotion	86	43.0	81	40.5	33	16.5
13	Patients do not appreciate the pharmacist 's role as a breast cancer health promoter	107	53.5	52	26.0	41	20.5
14	Patients will be offended if I offer them breast cancer counseling	132	66.0	26	13.0	42	21.0
15	I am not reimbursed for providing breast cancer health promotion.	130	65.0	24	12.0	46	23.0

#### 1. Patients with breast cancer and their impressions of pharmacists

210 women with breast cancer were invited to take part in the study, while 200 of them completed it to the end; that resulted in a response rate of 95.2%. The sample had a median age of 50.5 with an IQR of 16.3 years.

Table 7 shows data relating to breast cancer patients and their opinions concerning pharmacists.

The patient sample population included 200 patients. 70% were married, and 87.5% were housewives. Around half of the patients were of the working class social group where their income only covered the vital necessities of life. The other half can be divided into two groups; 28% had a challenging financial condition (not sufficient for the necessities of life) and the remaining percentage was made up by those of sound financial standing.

24% of them had never participated in an educational program about breast cancer. Around 53% of the patients visit pharmacies at least once a month and the rest were seen to visit pharmacies between 2-5 times a month. 90% of all patients found pharmacists friendly and caring. 67% found pharmacists' knowledge accurate and specialised, where 30% of them found their knowledge to be average by all accounts.

Almost 80% of all patients found pharmacists had a good knowledge of the side-effects of prescribed medication, even the ones that affect patients' daily life or beauty; while 20% found them to only know about the general side-effects and nothing specific. 86% of patients had been advised by

pharmacists before being exposed to chemotherapy more than once. 42.5% of the patients reported that pharmacists checked up on them after every routine visit to the hospital. 30.5% of them suggested pharmacists only gave medical opinion at their specific request.

Characteristic	n	%
Marital status		
Married	140	70.0
Divorced/widowed	28	14.0
Single	32	16.0
Employment status		
Employed	175	87.5
Unemployed	25	12.5
Socioeconomic status perception		
Not enough money to cover necessary expenses	57	28.5
Money only to cover necessary expenses	99	49.5
Enough money for extra expenses	44	22
Have you ever attended an educational program		
Yes	48	24
No	152	76
The number of visits to the pharmacy per month	152	/0
1	106	53
2	40	20
3-5	35	17.5
>5	19	95
How would you rate the attitudes of the pharmacists?	17	0
Unfriendly and uninterested	11	55
Friendly but distant	9	4.5
Friendly and interested	180	90
How would you rate the quality of information provided	100	70
by the pharmacist?		
Unclear and contradictory information	5	2.5
Only general information	60	30
Clear and customized information	135	67.5
How did the pharmacist emphasize the side effects?		
Emphasis on life-threatening side effects	41	20.5
Emphasis on effects on normal life style, including cosmetic	159	79.5
problems		
Frequency of pharmacist counselling before starting chemotherapy		
Once	28	14
More than once	172	86
Follow-up with the pharmacist after starting		
chemotherapy		
Every time a patient visits	85	42.5
At physician's, nurse's, or pharmacist's request	54	27
At patient's request	61	30.5

 Table 7 Demographics of patients & their impressions on pharmacists:

# **Chapter Five**

Discussion

This study was the first of this nature in Palestine, to the best of our knowledge, which identified pharmacists' levels of knowledge regarding breast cancer and clarified our understanding as to their beliefs regarding participation in the diagnosis and treatment of breast cancer and related ailments. In this study, our main aim was to highlight the degree of pharmacist involvement in breast cancer health promotion from the point of view of the pharmacists themselves. The study also aimed to identify the attitudes of pharmacists towards participating in breast cancer health promotional activities, to evaluate their degree of knowledge, to determine their extent of acceptance to engaging in continuous learning and training, and to identify the obstacles that limit their participation in the diagnosis and treatment of breast cancer patients. Also, the study also covered the impressions of breast cancer patients relating to the pharmacists they had visited.

The first part of the study was built on a questionnaire that embraced a variety of questions, and was answered by the pharmacist participants. The questions were taken from a previous study of a similar nature to achieve the same goals (El Hajj & Hamid, 2011). By employing a test-retest approach, we were able to prove that the questions posed were both internally consistent and reliable. Therefore, this approach validated that our questionnaires were suitably directed to achieve the study objective.

Unfortunately, the pharmacists in our study demonstrated a lack of sufficient information relating to breast cancer in general, although a large percentage

of them (59%) were evaluated as having either good or excellent levels of knowledge. The questions themselves were categorised under the headings; 'general knowledge, 'risk factors' and 'symptoms'. Our results were comparable to previous studies albeit in different countries. In Qatar, the score level for the same questions direct at Qatari pharmacists was slightly higher, (a mean score of 63%). Also, in a similar study conducted in Jordan, Jordanian pharmacists' level of knowledge was below satisfactory (40%.) In Iraq, the level of knowledge for 50% of community pharmacists was poor, and the other half demonstrated a satisfactory level (AL-Behadily & Al-Tukmagi, 2017; Ayoub et al., 2016; El Hajj & Hamid, 2011).

Pharmacists have the ability to be an extremely useful resource of information relating to breast cancer disease. It is true however that the pharmacists surveyed showed signs of weaknesses in varying forms of information relating to the disease. This may be due to the lack of local programs aimed to enhance professional working knowledge of breast cancer and limited training opportunities related to the disease; oft resulting in unprepared pharmacists. This case however was not only true of Palestine, but a similar trend can be observed in many other countries as shown in previous studies (AL-Behadily & Al-Tukmagi, 2017; Ayoub et al., 2016; El Hajj & Hamid, 2011). On the other hand, the percentage of pharmacists in Palestine and Qatar interested in developing their professional education on breast cancer matters was encouraging. However, in Iraq, only 38% supported the idea (AL-Behadily & Al-Tukmagi, 2017; El Hajj & Hamid, 2011).

Despite this weak level of knowledge about breast cancer, a high percentage of pharmacists (70%) confirmed their willingness to be an integral part of the treatment plan. They also stressed the importance of daily participation in this plan in addition to their normal pharmacy activities. They were also confident and fully prepared to help with treatment, where they emphasised their responsibility in distributing the much-needed educational resources to increase patient awareness, plus they were willing to possess these tools if enabled to do so. More than 80% were convinced that their participation in the treatment, counselling and advice phases directly to female patients can indeed save lives. All of that reflected a positive attitude from the Palestinian pharmacist participants. Also, these results correlated with the results of Jordan, Qatar and Iraq; where the pharmacists respectively shared the same mutual feeling of responsibility, and either agreed or strongly agreed with the importance of the subject (AL-Behadily & Al-Tukmagi, 2017; Ayoub et al., 2016; Suzuki et al., 2017).

The key relationship relating to knowledge found in our study was that of gender, in which females scored higher regarding their depth of information concerning breast cancer disease. While the study in Jordan showed that there was a definite correlation between cognitive levels and the beliefs of pharmacists (Ayoub et al., 2016).

Unfortunately, the desire to integrate pharmacists into a truly holistic treatment approach; be it screening or by counselling patients, is currently missing in Palestine. This may be due to several obstacles; first and foremost

may be due to the lack of staff available in the current shift working patterns observed. Secondly, if the pharmacist discussed this kind of information openly with female patients it may be considered as 'socially taboo' and subsequently taken as some kind of insult. Lastly, the lack of financial return for this advice was also considered as one of the most important obstacles from the point of view of the pharmacists themselves. The results of this study were very different from studies in other countries, in which the obstacles mostly focussed on the lack of time, privacy, and skills. These were obviously experienced by the pharmacists in Jordan. Whilst in the case of Qatari pharmacies, the constraints were deemed as the lack of educational materials and staff, in addition to the lack of appreciation towards the pharmacists' potentially valuable contribution to this area of study. For the Iraqi case, the most important obstacle was the lack of time in addition to the lack of the educational materials (AL-Behadily & Al-Tukmagi, 2017; Ayoub et al., 2016; Suzuki et al., 2017).

The second part of the study covered patients with breast cancer. 200 patient participants were employed as part of the study. Our sample population in the study had a median age of 50.5 years, this is close to the values of similar studies conducted in Japan, where the median age was 53 years (Kawaguchi et al., 2014).

Around half of our patients had an average financial condition where their incomes only covered the vital necessities of life. The other half could be divided into two groups; 28% of whom having a deficient financial

condition, which does not cover the necessities of life and the remaining percentage reported having an excellent financial condition.

24% of them had never participated in an educational program about breast cancer. Around 53% of the patients visited pharmacies at least once a month and the remaining percentage reported visiting pharmacies between 2 to 5 times a month.

90% of the patients experienced friendly and caring pharmacists, and most patients preferred to deal with these pharmacists. Around 67% found them to have an accurate and in fact, specialised knowledge. As for the pharmacists' knowledge relating to side-effects, such as those that affect patients' daily life or beauty; 80% of the patients found that they had a good level of knowledge in that regard. In the Japanese study, the results were quite similar to those of our study, in that patients often preferred to communicate with friendly and interested pharmacists (Kawaguchi et al., 2014).

#### **Limitations:**

It is necessary to shed light on some of the limitations that we faced while carrying out this research. Firstly, there is an absence of previous studies of this nature in Palestine and thus the ability to make comparison of the study findings with those of other local reports is not available. Secondly, despite the number of pharmacists in Palestine, only a minority of those who initially registered their interest in participation, continued until the end of the research. This created a deficit in relation to the number of samples required, thus with a higher sample size, more results could have contributed to the findings. A further limitation was due to the nature of the research design methodology employed, as the questionnaire distribution method relied on the researchers meeting pharmacists and patients face to face, thus, coupled with the economic and political situation in Palestine - increased the difficulty of reaching all regions and reaching the desired number of samples.

## **Conclusion:**

In this study, we found that pharmacists in Palestine, no matter where they worked exhibited a moderate level of knowledge about breast cancer. However, they were willing to increase their knowledge and to form part of the medication plan. If this improvement does indeed come into fruition, it would then be easier to control the advent of breast cancer disease in the Palestinian community.

## **Recommendations:**

This study sheds light on the importance of increasing pharmacists' access to knowledge and training in the subject of breast cancer disease.

Enhancing this comes through adjusting the academic plan of pharmaceutical education, including continuous training for pharmacists before and after graduation, and providing the necessary materials and tools in pharmacy clinics. Consequently, pharmacists can then seek to become more educated and fully-trained to be a part of the proposed holistic medication plan serving breast cancer patients.

As part of this approach, knowledge can further be enhanced via increased patient-pharmacist interaction. Whilst patients' confidence in their local pharmacist will no doubt increase as a result.

Should changes to academic curriculums take effect, it is envisaged that within one educational cycle, positive results should become clear both in the application of theory and hands-on practice.

Lastly, this study forms a solid platform on which to base further national studies, and we recommend studies continue to bridge existing gaps in knowledge and capability.

## 61 **References**

- Abu-Rmeileh, N. M., Gianicolo, E. A. L., Bruni, A., Mitwali, S., Portaluri,
   M., Bitar, J., . . . Vigotti, M. A. (2016). Cancer mortality in the West
   Bank, occupied Palestinian territory. *BMC public health*, *16*(1), 1-10.
- AL-Behadily, H. H., & Al-Tukmagi, H.F. (2017). Knowledge, attitudes and barriers towards breast cancer health education among Iraqi community pharmacists. *Iraqi Journal of Pharmaceutical Sciences (P-ISSN:* 1683-3597, E-ISSN: 2521-3512), 56-65.
- Alexandraki, I., & Mooradian, A. D. (2010). Barriers related to mammography use for breast cancer screening among minority women. Journal of the National Medical Association, 102(3), 206-218.
- AlWaheidi, S. (2019). Breast cancer in Gaza—a public health priority in search of reliable data. *ecancermedicalscience*, 13.
- Amro, A., Dhaidel, H., Amer, M., Qassis, H., Hilal, R., Jarayse, I., & Hamdan, E. (2018). Quality of Life, pain, and disability Post-surgical management of Breast Cancer.
- Assali, M., Shawahna, R., Dayyeh, S., Shareef, M., & Alhimony, I.A. (2018). Dexamethasone-diclofenac loaded polylactide nanoparticles: Preparation, release and anti-inflammatory activity. *European Journal of Pharmaceutical Sciences*, *122*, 179-184. doi: 10.1016/j.ejps.2018.07.012
- Austin, L. T., Ahmad, F., McNally, M.-J & ,.Stewart, D. E. (2002). Breast and cervical cancer screening in Hispanic women: a literature review using the health belief model. *Women's Health Issues*, 12(3), 122-128.
- Ayoub, N. M., Nuseir, K. Q., Othman, A. K., & Abu Alkishik, S. (2016).
  Knowledge ,attitudes and barriers towards breast cancer health education among community pharmacists. *Journal of Pharmaceutical Health Services Research*, 7(3), 189-198.
- Azaiza, F., & Cohen, M. (2006). Health beliefs and rates of breast cancer screening among Arab women. Journal of Women's Health, 15(5), 520-530.
- Baijal, P., & Periyakoil, V. (2014). Understanding frailty in cancer patients. *The Cancer Journal*, 20(5), 358-366.
- Barbour, S. Y. (2008). Caring for the treatment-experienced breast cancer patient: the pharmacist's role. *American Journal of Health-System Pharmacy*, 65(10\_Supplement\_3), S16-S22.
- Beshir, S. A., & Hanipah, M. A. (2012). Knowledge, perception, practice and barriers of breast cancer health promotion activities among community pharmacists in two Districts of Selangor state, Malaysia. Asian Pacific Journal of Cancer Prevention, 13(9), 4427-4430.
- Birand, N., Boşnak, A. S., Diker, Ö., Abdikarim, A., & Başgut, B. (2019).
  The role of the pharmacist in improving medication beliefs and

adherence in cancer patients. *Journal of Oncology Pharmacy Practice*, 25(8), 1916-1926.

- Calip, G. S., Xing, S., Jun, D.-H., Lee, W.-J., Hoskins, K. F., & Ko, N. Y. (2017). Polypharmacy and adherence to adjuvant endocrine therapy for breast cancer. *Journal of oncology practice*, *13*(5), e451-e462.
- Chaves, C., Shawahna, R., Jacob, A., Scherrmann, J. M., & Declèves, X. (2014). Human ABC transporters at blood-CNS interfaces as determinants of CNS drug penetration. *Current Pharmaceutical Design*, 20(10), 1450-1462. doi: 10.213816128113199990466/174
- Crespo, A., & Tyszka, M. (2017). Evaluating the patient-perceived impact of clinical pharmacy services and proactive follow-up care in an ambulatory chemotherapy unit. *Journal of Oncology Pharmacy Practice*, 23(4), 243-248.
- Dang ,C., Amiruddin, M., Lai, S., Low, C., & Chan, S. (2017). An emerging role of pharmacist in pre-chemotherapy counseling among breast cancer patients. *Indian Journal of Pharmaceutical Sciences*, 79(2), 294-302.
- Declèves, X., Jacob, A., Yousif, S., Shawahna ,R., Potin, S., & Scherrmann, J. M. (2011). Interplay of drug metabolizing CYP450 enzymes and ABC transporters in the blood-brain barrier. *Current Drug Metabolism*, 12(8), 732-741. doi: 10.2174/138920011798357024
- DeSantis, C. E., Bray, F., Ferlay, J., Lortet-Tieulent, J., Anderson, B. O.,
  & Jemal, A. (2015). International variation in female breast cancer

incidence and mortality rates. *Cancer Epidemiology and Prevention Biomarkers*, 24(10), 1495-1506.

- Dorris III, J. R., & Jones, S. (2014). Everolimus in breast cancer: the role of the pharmacist. Annals of Pharmacotherapy, 48(9), 1194-1201.
- El Hajj, M. S., & Hamid, Y. (2011). Breast cancer health promotion in Qatar: a survey of community pharmacists' interests and needs. *International journal of clinical pharmacy*, 33(1), 70-79.
- Fan, L., Strasser-Weippl, K., Li, J.-J., St Louis, J., Finkelstein, D. M., Yu,
  K.-D., . . . Goss, P. E. (2014). Breast cancer in China. *The lancet* oncology, 15(7), e279-e289.
- Felton, M. A., van Londen, G., & Marcum, Z. A. (2016). Medication adherence to oral cancer therapy: The promising role of the pharmacist. *Journal of Oncology Pharmacy Practice*, 22(2), 378-381.
- Ferlay, J., Soerjomataram, I., Dikshit, R., Eser, S., Mathers, C., Rebelo, M., . . . Bray, F. (2015). Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *International journal of cancer*, 136(5), E359-E386.
- Ferracini, A., Rodrigues, A., De Barros, A., Derchain, S., & Mazzola, P. (2018). Prescribing errors intercepted by pharmacist intervention in care of patients hospitalised with breast and gynaecological cancer at a Brazilian teaching hospital. *European journal of cancer care, 27*(1), e12767.

- Fitzmaurice, C., Dicker, D., Pain, A., Hamavid, H., Moradi-Lakeh, M., MacIntyre, M .F., . . . Wolfe, C. (2015). The global burden of cancer 2013. JAMA oncology, 1(4), 505-527.
- Fritz-French, C., Shawahna, R., Ward, J. E., Maroun, L. E., & Tyor, W.
  R. (2014). The recombinant vaccinia virus gene product, B18R, neutralizes interferon alpha and alleviates histopathological complications in an HIV encephalitis mouse model. *Journal of Interferon and Cytokine Research*, 34(7), 510-517. doi: 10.1089/jir.2013.0072
- Ganz, P. A., & Goodwin, P. J. (2015). Breast cancer survivorship:
  where are we today? *Improving Outcomes for Breast Cancer Survivors* (pp. 1-8): Springer.
- Giles, J. T., Kennedy, D. T., Dunn, E. C., Wallace, W. L., Meadows, S. L., & Cafiero, A. C. (2001). Results of a community pharmacy-based breast cancer risk-assessment and education program. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, 21(2), 243-253.
- Haddad, L. (2018). Knowledge, Attitude and Practice of Breast Self-Examination Among Females Governmental School Teachers in Bethlehem District-Palestine, 2015. *Iproceedings*, 4(1), e10568.
- Hugtenburg, J. G., En-nasery, S., Tromp, V. N., Westerman, M. J., Timmers, L., Boons, C. L., & Konings, I. (2018). PATIENTS'NEEDS
   AND WISHES REGARDING PHARMACEUTICAL CARE

**PROVIDED BY THE PHARMACIST FOR WOMEN TREATED WITH ADJUVANT ENDOCRINE THERAPY FOR BREAST CANCER.** *Research in Social and Administrative Pharmacy, 14*(8), E39-E39.

- Humphries, B., Collins, S., Guillaumie, L., Lemieux, J., Dionne, A., Provencher, L., . . . Lauzier, S. (2018). Women's Beliefs on Early Adherence to Adjuvant Endocrine Therapy for Breast Cancer: A Theory-Based Qualitative Study to Guide the Development of Community Pharmacist Interventions. *Pharmacy*, 6(2), 53.
- Jaradat, N., Al-Maharik, N., Abdallah, S., Shawahna, R., Mousa, A., & Qtishat, A. (2020). Nepeta curviflora essential oil: Phytochemical composition, antioxidant, anti-proliferative and anti-migratory efficacy against cervical cancer cells, and α-glucosidase, α-amylase and porcine pancreatic lipase inhibitory activities. *Industrial Crops and Products*, 158. doi: 10.1016/j.indcrop.2020.112946
- Jaradat, N. A., Shawahna, R., Eid, A. M., Al-Ramahi, R., Asma, M. K., & Zaid, A. N. (2016). Herbal remedies use by breast cancer patients in the West Bank of Palestine. *Journal of Ethnopharmacology*, *178*, 1-8. doi: 10.1016/j.jep.2015.11.050
- Jaradat, N. A., Shawahna, R., Hussein, F., & Al-Lahham, S. (2016).
  Analysis of the antioxidant potential in aerial parts of Trigonella arabica and Trigonella berythea grown widely in Palestine: A

comparative study. *European Journal of Integrative Medicine*, 8(5), 623-630. doi: 10.1016/j.eujim.2016.04.004

- Jaradat, N. A., Zaid, A. N., Abuzant, A., & Shawahna, R. (2016). Investigation the efficiency of various methods of volatile oil extraction from Trichodesma africanum and their impact on the antioxidant and antimicrobial activities. *Journal of Intercultural Ethnopharmacology*, 5(3), 1-7. doi: 10.5455/jice.20160421065949
- Jones, A. L. (2006). Fertility and pregnancy after breast cancer. The Breast, 15, S41-S46.
- Jones, K. L., Barnett, C., Gauthier, M., Boster, B., Espirito, J. L., & Michaud, L. B. (2012). Clinical outcomes of a pharmacist-managed anticoagulation service for breast cancer patients. *Journal of Oncology Pharmacy Practice*, 18(1), 122-127.
- Kachroo, S. (2006). Pharmacists should assume a larger role in overcoming the racial/ethnic barriers to breast cancer screening. *Journal of Managed Care Pharmacy*, 12(5), 406-407.
- Kawaguchi, T., Azuma, K., Yamaguchi, T., Iwase, S., Matsunaga, T., Yamada, K., . . . Akashi, T. (2014). Preferences for pharmacist counselling in patients with breast cancer: a discrete choice experiment. *Biological and Pharmaceutical Bulletin*, b14-00452.
- Kawaguchi, T., Iwase, S., Koinuma, M., Onodera, Y., Takeuchi, H.,
  Umeda, M., . . . Nagumo, Y. (2012). Determinants affecting quality of

life: implications for pharmacist counseling for patients with breast cancer in Japan. *Biological and Pharmaceutical Bulletin*, 35(1), 59-64.

- Kortejärvi, H., Malkki, J., Shawahna, R., Scherrmann, J. M., Urtti, A., & Yliperttula, M. (2014). Pharmacokinetic simulations to explore dissolution criteria of BCS i and III biowaivers with and without MDR-1 efflux transporter. *European Journal of Pharmaceutical Sciences*, 61(1), 18-26. doi: 10.1016/j.ejps.2014.02.004
- Kortejärvi ,H., Malkki, J., Shawahna, R., Scherrmann, J. M., Urtti, A., & Yliperttula, M. (2019). Corrigendum to "Pharmacokinetic simulations to explore dissolution criteria of BCS I and III biowaivers with and without MDR-1 efflux transporter" (European Journal of Pharmaceutical Sciences (2014) 61 (18–26), (S0928098714000621), (10.1016/j.ejps. 2014.02. 004)). European Journal of Pharmaceutical Sciences, 131, 254. doi: 10.1016/j.ejps.2019.03.004
- Kortejärvi, H., Shawahna, R., Koski, A., Malkki, J., Ojala, K., & Yliperttula, M. (2010). Very rapid dissolution is not needed to guarantee bioequivalence for biopharmaceutics classification system (BCS) I drugs. *Journal of Pharmaceutical Sciences*, 99(2), 621-625. doi: 10.1002/jps.21879
- Luisetto, M., Carini, F., Bologna, G & "Nili-Ahmadabadi, B. (2015).
  Pharmacist cognitive service and pharmaceutical care today and tomorrow outlook. UKJPB, 3, 67-72.

- Lum, B. L., McWaters, D. S., & Mergener, M. A. (1989). Cancer detection and the community pharmacist. *American pharmacy*(7), 54.59-
- McGuire, T. R., Leypoldt, M., Narducci, W. A., & Ward, K. (2007). Accessing rural populations: role of the community pharmacist in a breast and cervical cancer screening programme. *Journal of evaluation in clinical practice*, 13(1), 146-149.
- Mensah ,K. B., Oosthuizen, F., & Bonsu, A. B. (2018). Cancer awareness among community pharmacist: a systematic review. BMC cancer, 18(1), 1-9.
- Partridge, A. H., & Ruddy, K. J. (2007). Fertility and adjuvant treatment in young women with breast cancer. *The Breast*, 16, 175-181.
- Periasamy, U., Sidik, S. M., Rampal, L., Fadhilah, S. I., Akhtari-Zavare, M., & Mahmud, R. (2017). Effect of chemotherapy counseling by pharmacists on quality of life and psychological outcomes of oncology patients in Malaysia: a randomized control trial. *Health and quality of life outcomes*, 15(1), 1-10.
- Pruitt, L., Mumuni, T., Raikhel, E., Ademola, A., Ogundiran, T., Adenipekun, A., . . . Olopade, O. I. (2015). Social barriers to diagnosis and treatment of breast cancer in patients presenting at a teaching hospital in Ibadan, Nigeria. *Global public health*, 10(3), 331-344.

- Ribnikar, D., Ribeiro, J., Pinto, D., Sousa, B., Pinto, A., Gomes, E., . . .
  Cardoso, F. (2015). Breast cancer under age 40: a different approach.
  *Current treatment options in oncology, 16*(4), 16.
- San-Juan-Rodriguez, A., Newman, T. V., Hernandez, I., Swart, E. C., Klein-Fedyshin, M., Shrank, W. H., & Parekh, N. (2018). Impact of community pharmacist-provided preventive services on clinical, utilization, and economic outcomes: an umbrella review. *Preventive medicine*, 115, 145-155.
- Schnipper, J. L., Kirwin, J. L., Cotugno, M. C., Wahlstrom, S. A., Brown,
  B. A., Tarvin, E., . . . McKean, S. C. (2006). Role of pharmacist counseling in preventing adverse drug events after hospitalization.
  Archives of internal medicine, 166(5), 565-571.
- Schulz, M., Klopp-Schulze, L., Keilhack, S., Meyer, S., Botermann, L., & Kloft, C. (2019). Adherence to tamoxifen in breast cancer patients:
  What role does the pharmacist play in German primary care?
  *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada*, 152(1), 28-34.
- Shawahna, R. (2015). Physical and metabolic integrity of the bloodbrain barrier in HIV infection: A special focus on intercellular junctions, influx and efflux transporters and metabolizing enzymes. *Current Drug Metabolism*, 16(2), 105-123. doi: 10.2174/138920021602150713114715

- Shawahna, R. (2016). Pediatric biopharmaceutical classification system: Using age-appropriate initial gastric volume. AAPS Journal, 18.736-728 ,(3)doi: 10.1208/s12248-016-9885-2
- Shawahna, R. (2017). Which information on women's issues in epilepsy does a community pharmacist need to know? A Delphi consensus study. *Epilepsy and Behavior*, 77, 79-89. doi: 10.1016/j.yebeh.2017.09.026
- Shawahna, R .(2018) .Combining and using the utrecht method and the analytic hierarchy process to facilitate professional and ethical deliberation and decision making in complementary and alternative medicine: A case study among a panel of stakeholders. *Evidence-based Complementary and Alternative Medicine, 2018.* doi: 10.1155/2018/2315938
- Shawahna, R. (2019a). Development of key performance indicators to capture in measuring the impact of pharmacists in caring for patients with epilepsy in primary healthcare: A Delphi consensual study. *Epilepsy and Behavior*, 98, 129-138. doi: 10.1016/j.yebeh.2019.07.034
- Shawahna, R. (2019b). Merits, features, and desiderata to be considered when developing electronic health records with embedded clinical decision support systems in Palestinian hospitals: A consensus study. *BMC Medical Informatics and Decision Making*, 19(1). doi: 10.1186/s12911-019-0928-3

- Shawahna, R. (2020a). Agreement of Palestinian nursing students with recommendations to eliminate epilepsy stigma and change perception of the general public about epilepsy: A cross-sectional study. *Epilepsy and Behavior*, 109. doi: 10.1016/j.yebeh.2020.107126
- Shawahna, R. (2020b). Development of Key Performance Indicators for Capturing Impact of Pharmaceutical Care in Palestinian Integrative Healthcare Facilities: A Delphi Consensus Study. *Evidence-based Complementary and Alternative Medicine, 2020.* doi: 10.1155/2020/7527543
- Shawahna, R. (2020c). Facilitating ethical, legal, and professional deliberations to resolve dilemmas in daily healthcare practice: A case of driver with breakthrough seizures. *Epilepsy and Behavior*, 102. doi: 10.1016/j.yebeh.2019.106703
- Shawahna, R. (2020d). Quality Indicators of Pharmaceutical Care for Integrative Healthcare: A Scoping Review of Indicators Developed Using the Delphi Technique. *Evidence-based Complementary and Alternative Medicine*, 2020. doi: 10.1155/2020/9131850
- Shawahna, R. (2020e). Quality Indicators of Pharmaceutical Care in Palestinian **Integrative Healthcare Facilities:** Findings of a Evidence-based Qualitative Study among Stakeholders. 2020. *Complementary* and Alternative Medicine, doi: 10.1155/2020/4520769

- Shawahna, R., Abbas, A., & Ghanem, A. (2019). Medication transcription errors in hospitalized patient settings: A consensual study in the Palestinian nursing practice. *BMC Health Services Research*, 19(1). doi: 10.1186/s12913-019-4485-3
- Shawahna, R., Abdelfattah, B., Shafei, M., & Ruzzeh, S. (2020).
  Therapeutic monitoring of antiepileptic drugs: Recommendations to improve care of patients with epilepsy in the Palestinian practice. *Epilepsy and Behavior, 111*. doi: 10.1016/j.yebeh.2020.107215
- Shawahna, R., & Abdelhaq, I. (2020a). Exploring perceived benefits, motives, barriers, and recommendations for prescribing yoga exercises as a nonpharmacological intervention for patients with epilepsy: A qualitative study from Palestine. *Epilepsy and Behavior*, 106. doi: 10.1016/j.yebeh.2020.107041
- Shawahna, R., & Abdelhaq, I. (2020b). Important knowledge items with regard to the benefits of exercise for patients with epilepsy: Findings of a qualitative study from Palestine. *Epilepsy and Behavior*, 108. doi: 10.1016/j.yebeh.2020.107099
- Shawahna, R., & Al-Atrash, M. (2019). What Do Primary Healthcare
  Providers and Complementary and Alternative Medicine
  Practitioners in Palestine Need to Know about Exercise for Cancer
  Patients and Survivors: A Consensual Study Using the Delphi
  Technique. Evidence-based Complementary and Alternative Medicine,
  2019. doi: 10.1155/2019/7695818

- Shawahna, R., Al-Rjoub, M., Al-Horoub, M. M., Al-Hroub, W., Al-Rjoub, B., & Al-Nabi, B. A. (2016). Risk of error estimated from Palestine pharmacists' knowledge and certainty on the adverse effects and contraindications of active pharmaceutical ingredients and excipients. *Journal of educational evaluation for health professions, 13*, 1. doi: 10.3352/jeehp.2016.13.1
- Shawahna, R., Atrash, A., Jebril, A., Khalaf, A., Shaheen, E., & Tahboosh,
  H. (2017a). Evaluation of pharmacists' knowledge of women's issues
  in epilepsy: A cross-sectional study in Palestinian pharmacy practice.
  *Seizure*, 46, 1-6. doi: 10.1016/j.seizure.2017.01.002
- Shawahna, R., Atrash, A., Jebril, A., Khalaf, A., Shaheen, E., & Tahboosh,
  H. (2017). Evaluation of pharmacists' knowledge of women's issues in
  epilepsy: a cross-sectional study in Palestinian pharmacy practice.
  Seizure, 46, 1-6.
- Shawahna, R., Atrash, A., Jebril, A., Khalaf, A., Shaheen, E., & Tahboosh,
  H. (2017b). Pharmacists' knowledge of issues in pharmacotherapy of
  epilepsy using antiepileptic drugs: A cross-sectional study in
  Palestinian pharmacy practice. *Epilepsy and Behavior*, 67, 39-44. doi:
  10.1016/j.yebeh.2016.11.027
- Shawahna, R., Batta, A., Asa'ad, M., Jomaah, M., & Abdelhaq, I. (2021).
  Exercise as a complementary medicine intervention in type 2 diabetes mellitus: A systematic review with narrative and qualitative synthesis

of evidence. Diabetes and Metabolic Syndrome: Clinical Research and Reviews, 15(1), 273-286. doi: 10.1016/j.dsx.2021.01.008

- Shawahna, R., Debay, M., & Nisar Ur, R. (2013). Inequalities in health care and behaviour in patients with diabetes and concurrent hypertension in Lahore, Pakistan. *Tanzania Journal of Health Research*, 15(4). doi: 10.4314/thrb.v15i4.x
- Shawahna, R., Declèves, X., & Scherrmann, J. M. (2013). Hurdles with using in vitro models to predict human blood-brain barrier drug permeability: A special focus on transporters and metabolizing enzymes. *Current Drug Metabolism*, 14(1), 120-136. doi: 10.2174/138920013804545232
- Shawahna, R., Fahed, B., Qadri, D., Sharawi, L., Soroghli, M., & Dweik,
  M. (2017). Awareness and knowledge of autism spectrum disorders among pharmacists: A cross-sectional study in Palestinian pharmacy practice. *Journal of Autism and Developmental Disorders*, 47(6), 1618-1627. doi: 10.1007/s10803-017-3085-5
- Shawahna, R., Ganeshamoorthy, K., Huilong, L., Scherrmann, J. M., Couraud, P. O., & Declèves, X. (2017). Effect of Long-term In Vitro Lithium Exposure on mRNA Levels of Claudin-3, CYP1A1, ABCG2 and GSTM3 Genes in the hCMEC/D3 Human Brain Endothelial Cell Line. European Journal of Drug Metabolism and Pharmacokinetics, 42(6), 1013-1017. doi: 10.1007/s13318-017-0412-3

- Shawahna, R., Ghanem, M., Ghanem, A., Mansour, A. F., Ahmad, N., & Zaid, A. N. (2015). Establishing similarity between multisource betahistine dihydrochloride oral dosage forms using in vitro methods. *Acta Poloniae Pharmaceutica Drug Research*, 72(6), 1245-1252.
- Shawahna, R., Haddad, A., Khawaja, B., Raie, R., Zaneen, S., & Edais, T. (2016). Medication dispensing errors in Palestinian community pharmacy practice: a formal consensus using the Delphi technique. *International Journal of Clinical Pharmacy*, *38*(5), 1112-1123. doi: 10.1007/s11096-016-0338-x
- Shawahna, R., & Hamdan, A. (2017). Use and preference of information technology and social media networks in medical sciences education in the West Bank of Palestine. Paper presented at the ICIT 2017 - 8th International Conference on Information Technology, Proceedings.
- Shawahna, R., Hattab, S., Al-Shafei, R., & Tab'ouni, M. (2020).
  Prevalence and factors associated with depressive and anxiety symptoms among Palestinian medical students. *BMC Psychiatry*, 20(1). doi: 10.1186/s12888-020-02658-1
- Shawahna, R., Hroub, A. K., Abed, E., Jibali, S., Al-Saghir, R., & Zaid,
  A. N. (2016). Pharmaceutical quality of generic atorvastatin products
  compared with the innovator product: A need for revising pricing
  policy in Palestine. Acta Poloniae Pharmaceutica Drug Research,
  73(3), 725-730.

- Shawahna, R., & Jaber, M. (2020a). Assessing knowledge and attitudes of Palestinian undergraduate nursing students toward epilepsy and patients with epilepsy: A cross-sectional study. *Epilepsy & amp; behavior : E&B, 102,* 106811. doi: 10.1016/j.yebeh.2019.106811
- Shawahna, R., & Jaber, M. (2020b). Crossword puzzles improve learning of Palestinian nursing students about pharmacology of epilepsy: Results of a randomized controlled study. *Epilepsy and Behavior*, 106. doi: 10.1016/j.yebeh.2020.107024
- Shawahna, R., & Jaradat, N. A. (2017). Ethnopharmacological survey of medicinal plants used by patients with psoriasis in the West Bank of Palestine. *BMC Complementary and Alternative Medicine*, 17(1). doi: 10.1186/s12906-016-1503-4
- Shawahna, R., Khaskiyyi, M., Abdo, H., Msarwe, Y., Odeh, R., & Salame,
  S. (2017). Palestinian pharmacists' knowledge of issues related to
  using psychotropic medications in older people: a cross-sectional
  study. Journal of educational evaluation for health professions, 14, 8.
  doi: 10.3352/jeehp.2017.14.8
- Shawahna, R., Masri, D., Al-Gharabeh, R., Deek, R., Al-Thayba, L., & Halaweh, M. (2016). Medication administration errors from a nursing viewpoint: A formal consensus of definition and scenarios using a Delphi technique. *Journal of Clinical Nursing*, 25(3-4), 412-423. doi: 10.1111/jocn.13062

- Shawahna, R., Nisar Ur, R., Ahmad, M., Debray, M., Declèves, X., Yliperttula, M., & Blom, M. (2012). Prescribers' perspectives of the socioeconomic status and important indicators affecting prescribing behavior in a developing country. *Central European Journal of Medicine*, 7(1), 129-136. doi: 10.2478/s11536-011-0123-0
- Shawahna, R., Odeh, M., & Jawabreh, M. (2019). Factors Promoting Clinical Inertia in Caring for Patients with Dyslipidemia: A Consensual Study Among Clinicians who Provide Healthcare to Patients with Dyslipidemia. *Journal of the National Medical Association, 111*(1), 18-27. doi: 10.1016/j.jnma.2018.04.002
- Shawahna, R., Qiblawi, S., & Ghanayem, H. (2018). Which Benefits and Harms of Using Fenugreek as a Galactogogue Need to Be Discussed during Clinical Consultations? A Delphi Study among Breastfeeding Women, Gynecologists, Pediatricians, Family Physicians, Lactation Consultants, and Pharmacists. *Evidence-based Complementary and Alternative Medicine*, 2018. doi: 10.1155/2018/2418673
- Shawahna, R., & Rahman, N. U .(2011) .Evaluation of the use of partition coefficients and molecular surface properties as predictors of drug absorption: A provisional biopharmaceutical classification of the list of national essential medicines of Pakistan. DARU, Journal of Pharmaceutical Sciences, 19(2), 83-99.
- Shawahna, R., Rahman, N. U., Ahmad, M., Debray, M., Yliperttula, M.,
  & Declèves, X. (2011). Electronic prescribing reduces prescribing

error in public hospitals. *Journal of Clinical Nursing*, 20(21-22), 3233-3245. doi: 10.111/1j.1365-2702.2011.03714.x

- Shawahna, R., Rahman, N. U., Ahmad, M., Debray, M., Yliperttula, M., & Declèves, X. (2013). Impact of prescriber's handwriting style and nurse's duty duration on the prevalence of transcription errors in public hospitals. *Journal of Clinical Nursing*, 22(3-4), 550-558. doi: 10.1111/j.1365-2702.2012.04076.x
- Shawahna, R., Samaro, S., & Ahmad, Z. (2021). Knowledge, attitude, and practice of patients with type 2 diabetes mellitus with regard to their disease: a cross-sectional study among Palestinians of the West Bank. *BMC Public Health*, 21(1). doi: 10.1186/s12889-021-10524-2
- Shawahna, R., Shanti, Y., Al Zabadi, H., Sharabati, M., Alawneh, A., Shaqu, R., ... Bustami, A. (2018). Prevalence and association of clinical characteristics and biochemical factors with complications of diabetes mellitus in Palestinians treated in primary healthcare practice. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 12(5), 693-704. doi: 10.1016/j.dsx.2018.04.024
- Shawahna, R., & Taha, A. (2017). Which potential harms and benefits of using ginger in the management of nausea and vomiting of pregnancy should be addressed? A consensual study among pregnant women and gynecologists. BMC Complementary and Alternative Medicine, 17(1). doi: 10.1/186s12906-017-1717-0

- Shawahna, R., Uchida, Y., Declèves, X., Ohtsuki, S., Yousif, S., Dauchy, S., . . . Scherrmann, J. M. (2011). Transcriptomic and quantitative proteomic analysis of transporters and drug metabolizing enzymes in freshly isolated human brain microvessels. *Molecular Pharmaceutics*, 8(4), 1332-1341. doi: 10.1021/mp200129p
- Shawahna, R., Zyoud, A., Dwikat, J., El-Helo, M., Yacoub, B., & Hilal, H. (2016). Breast Milk Lead Levels in 3 Major Regions of the West Bank of Palestine. *Journal of Human Lactation*, *32*(3), 455-461. doi: 10.1177/0890334416646566
- Shawahna, R., Zyoud, A., Haj-Yahia, A., & Taya, R. (2021). Evaluating Solubility of Celecoxib in Age-Appropriate Fasted- and Fed-State Gastric and Intestinal Biorelevant Media Representative of Adult and Pediatric Patients: Implications on Future Pediatric Biopharmaceutical Classification System. AAPS PharmSciTech, 22(3). doi: 10.1208/s12249-021-01958-3
- Shawahna, R., Zyoud, A., Jallad, D., Hadwan, L., Ihssan, N., & Hilal, H. (2018). Blood zinc levels in nursing women from different regions of the West Bank of Palestine. *Women and Health*, 58(7), 822-833. doi: 10.1080/03630242.2017.1342743
- Shawahna, R., Zyoud, A., Naseef, O., Muwafi, K., & Matar, A. (2021).
  Salivary Lead Levels among Workers in Different Industrial Areas in the West Bank of Palestine: a Cross-Sectional Study. *Biological Trace Element Research*. doi: 10.1007/s12011-020-02567-0

- Shawahna, R., Zyoud, A., Yahia, E. H., Sulieman, R., Haddad, A., Makhlof, M., . . . Hilal, H. (2020). Sub-chronic treatment with high doses of ascorbic acid reduces lead levels in hen eggs intentionally exposed to a concentrated source of lead: A pilot study. *BMC Pharmacology and Toxicology*, 21(1). doi: 10.1186/s40360-020-0389-4
- Shraim, N. Y., Shawahna, R., Sorady, M. A., Aiesh, B. M., Alashqar, G. S., Jitan, R. I., . . . Zyoud, S. H. (2017). Community pharmacists' knowledge, practices and beliefs about complementary and alternative medicine in Palestine: A cross-sectional study. *BMC Complementary and Alternative Medicine*, *17*(1). doi: 10.1186/s12906-017-1940-8
- Suzuki, S., Abbott, R., Sakurai, H., Kawasumi, K., Johnson, P. E., Tahara, M., . . . Endo, K. (2017). Evaluation of community pharmacist ability to ensure the safe use of oral anticancer agents: a nationwide survey in Japan. *Japanese journal of clinical oncology*, 47(5), 413-421.
- Tanaka, K., Hori, A., Tachi, T., Osawa, T., Nagaya, K., Makino, T., ... Nakada, T. (2018). Impact of pharmacist counseling on reducing instances of adverse events that can affect the quality of life of chemotherapy outpatients with breast Cancer. Journal of pharmaceutical health care and sciences, 4(1), 1-14.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha.
  *International journal of medical education*, 2, 53.

- Terada, T. (2016). Pharmaceutical Investigation for Individualized and Optimal Cancer Pharmacotherapy. Yakugaku zasshi: Journal of the Pharmaceutical Society of Japan, 136(11), 1469-1476.
- Tutt, L., Thornley, T., Chen, L.-C., & Anderson, C. (2018). Survivor perspectives on the role of the community pharmacist in breast cancer services. *Research in Social and Administrative Pharmacy*, 14(8), e31.
- Wang, L. (2017). Early diagnosis of breast cancer. Sensors, 17(7), 1572.
- Yokoyama, S., Yajima, S., Sakai, C ,.Yamashita, S., Noguchi, Y., Ino, Y., .
  Teramachi, H. (2017). Community pharmacist-led telephone follow-up enabled close management of everolimus-induced adverse events in an outpatient with metastatic breast cancer. Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 150(6), 362-365.
- Zyoud, A., Dwikat, M., Al-Shakhshir, S., Ateeq, S., Shteiwi, J., Zu'Bi, A.,
  ... Hilal, H. S. (2016). Natural dye-sensitized ZnO nano-particles as photo-catalysts in complete degradation of E. coli bacteria and their organic content. *Journal of Photochemistry and Photobiology A: Chemistry*, 328, 207-216. doi: 10.1016/j.jphotochem.2016.05.020
- Zyoud, A. H., Saleh, F., Helal, M. H., Shawahna, R., & Hilal, H. S. (2018).
  Anthocyanin-Sensitized TiO2 Nanoparticles for Phenazopyridine
  Photodegradation under Solar Simulated Light. Journal of Nanomaterials, 2018. doi: 10.1155/2018/2789616

# Appendix

The study tool.

Pharmacists' current involvement in breast cancer health promotion activities

Respond to patient inquiries related to breast cancer warning signs and symptoms and breast cancer early detection and screening tests

Provide patients with advice or counseling on breast cancer screening and early detection

Provide patients with breast cancer educational materials or self-assessment quizzes

Invite healthcare professionals to provide breast cancer education to patients in the pharmacy

Refer patients to special breast cancer screening programs organized by hospitals or cancer organizations in Palestine

Breast cancer knowledge

Breast cancer is the most common form of cancer among women

Breast cancer should not be of concern for patients younger than 40 years of age

Use of hormone replacement therapy is one of the risk factors for developing breast cancer

Late onset menstrual period is one of the risk factors for developing breast cancer

Nipple discharge can be a warning sign of breast cancer

Appropriate early screening for breast cancer reduces breast cancer mortality

Breast self-exam is one of the methods that are used to detect the presence of breast cancer

To detect the presence of breast cancer, women over the age of 20 and under the age of 40 should do a breast self-exam at least once per year

To detect the presence of breast cancer, women aged 40 years and above should do a monthly breast self-exam, an annual clinical breast exam and a biannual mammogram

Total mastectomy is the surgical option of choice for patients diagnosed with early-stage breast cancer

Patients with invasive breast cancer that is estrogen receptor positive should receive adjuvant endocrine therapy

Tamoxifen is the adjuvant endocrine therapy of choice for premenopausal patients with invasive breast cancer.

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



جامعه النجاح الوطنية كلية الطب وعلوم الصحة دائرة الدراسات العليا

#### **IRB** Approval Letter

Study Title:

Needs and interests of pharmacists in counseling and promoting healthy practices regarding breast cancer in Palestine: a study among pharmacists and patients with breast cancer

Submitted by:

Hiba Faisal Awawdeh , Dr. Ramzi Shawahna

Date Reviewed:

26t<sup>h</sup> October,2017

Date Approved: 20t<sup>h</sup> November, 2017

Your Study titled "Needs and interests of pharmacists in counseling and promoting healthy practices regarding breast cancer in Palestine: a study among pharmacists and patients with breast cancer" with achieved number (26) October 2017 was reviewed by An-Najah National University IRB committee and was approved on 20<sup>th</sup> November 2017.

Hasan Fitian, MD

a g

IRB Committee Chairman An-Najah National University

ــ نابلس - ص.ب 7 أو 707 || هاتف 2342902/4/7/8/14 (09) (099) || فاكسميل 2342910 (09) (099)

Nablus - P.O Box :7 or 707 | Tel (970) (05) 2342902/4/7/8/\_ ; \_ \_ \_ \_ \_ \_ \_ \_ \_ [ 09) 2342910 | E-mail : hgs@najah.edu

### An-Najah National University

Faculty of Graduate Studies Dean's Office



حامعة النجاح الوطنية كلية الدراسات العليا مكتب العميد

التاريخ: 2018/2/4

حضرة الدكتورة رواء الرمحي المحترمة منسق ةبرنامج ماجستير الصيدلة السريرية

تحية طيبة وبعد،

#### الموضوع والموافقة على عنوان الاطروحة وتحديد المشرف

قرر مجلس كلية الدراسات العليا في جلسته رقم (351)، المنعقدة بتاريخ 2018/2/1، الموافقة على مشروع الأطروحة المقدم من الطالب/ة هبه فيصل عبد الحمد عواوده، رقم تسجيل 11659100، تخصص ماجستير الصيدلة السريرية، عنوان الاطروحة:

(احتياجات واهتمامات الصيادلة في تقديم المشورة وتعزيز المعارسات الصحية المتعلقة بسرطان الثدي في فلسطين:

دراسة بين الصيادلة والمرضى) (Needs and Interests of Pharmacists in Counseling and Promoting Healthy Practices Regarding Brest Cancer in Palestine: A Study among Pharmacists and Patients)

بإشراف: د. رمزي شواهنة

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

وتفضلوا بغبول وافر الاحترام ...

د. محد سليمان عميد كلية الدراسات ألع

· Calintan (1

. 1. 1. 21

65-02-2010

نسخة ، د. رئيس قسم الدراسات العليا للعلوم الصحية والطبية المحترم

: ق. أ.ع. الفبول والتسجيل المحترم

: مشرف الطالب وملف الطالب

ملاحظة؛ على الطالب/ة مراجعة الدائرة المالية (محاسبة ال ة) قبل دفع رسوم تسجيل الاطروحة للضرورة

فلسطين، تابلسز، ص ب 7،707 هالك / 2345115، 2345113، 234511 (1972) فكسميل :972) (1972) فكسميل :972) (1972) (

جامعة النجاح الوطنية كلية الدراسات العليا

إعداد هبة عواوده

إشراف د. رمزي شواهنه

قدمت هذه الأطروحة استكمالا لمتطلبات الحصول على درجة الماجستير في الصيدلة، بكلية الدراسات العليا، جامعة النجاح الوطنية، نابلس – فلسطين. احتياجات واهتمامات الصيادلة في تقديم المشورة الطبية و تعزيز الممارسات الصحية فيما يخص مرض سرطان الثدي في فلسطين: دراسة على الصيادلة ومرضى سرطان الثدي إعداد هبة عواوده إشراف د. رمزى شواهنه

## الملخص

يعتبر سرطان الثدى من الأمراض الخطيرة التي تسبب نسبة مؤلمة من المرضى والوفيات بين النساء في فلسطين. يؤدي الصيادلة دورًا مهمًا في القطاع الطبي وبلعبون أيضًا دورًا حيويًا في علاج سرطان الثدى. تهدف هذه الدراسة إلى استكشاف مستوى المعرفة الحالي بين الصيادلة في فلسطين المشاركين في رعاية سرطان الثدي، بالإضافة إلى فهم ميولهم واستعدادهم للمساهمة في خطط علاج سرطان الثدى. علاوة على ذلك، ستسلط الدراسة الضوء على القدرات الحالية للصيادلة والسبل التي يتخذونها لتعزيز معرفتهم بعلاج سرطان الثدي كجزء من الدراسة ، تم أيضًا تحليل تجارب مرضى سرطان الثدى مع الصيادلة، مع مراعاة مستوى معرفة الصيدلي النسبي ومدى تعاونه مع المرضى. أجريت هذه الدراسة باستخدام منهج تصميم رصد مقطعي مستعرض، مع استبيان مزدوج النمط – موجه لكل من الصيادلة والمرضى على حد سواء في الضفة الغربية والقدس في فلسطين ، وقد تم تقديم الاستبيان الأول للصيادلة ، وتضمن 26 سؤالاً من أنماط مختلفة لاكتساب ردود الفعل المتعلقة. بمستوى معرفتهم ، في حين تم التحقق من مواقفهم ومعتقداتهم من خلال مجموعة من 14 سؤالا. أخيرًا ، تم تخصيص العديد من الأسئلة للمساعدة في فهم العوائق الموجودة في تعزيز الوعي الصحي بسرطان الثدي أثناء زيارات الصيدلية، وتناول الاستبيان الثاني الموزع على مرضى سرطان الثدي جوانب مختلفة بما في ذلك؛ المواقف تجاه الصيادلة وجودة المعلومات التي يقدمونها، والآثار الجانبية المتعلقة بالصيدلة، وتكرار الاستشارة والمتابعة اللاحقة مع الصيادلة، وقد اشتملت عينة الدراسة على 200 صيدلى و200 مريض بسرطان الثدي. تم تصنيف متوسط درجة المعرفة عند الصيادله 69.2٪ بدرجة حاصل الذكاء 15.2. وأبرز تحليل الانحدار اللوجستي متعدد المتغيرات أن الصيادلة

الذكور مقارنة بالإناث سجلوا معدل أرجحية قدره 0.21. كما وسجلوا 50% على الأقل في اختبار المعرفة. خلال فترة الدراسة، وجد أن الصيادلة يتبنون المواقف الإيجابية تجاه سرطان الثدي وكذلك يشجعون على القيام بحملات تهدف إلى تعزيز الوعي بسرطان الثدي. ومن بين المرضى الذين شملهم الاستطلاع، اعتبر 180 (90%) منهم أن المواقف التي عاشوها في الصيدليات كانت ودية. في حين أن 135 (67.5%) يولون تقديراً عالياً لجودة المعلومات المقدمة من الصيدليات المحلية الخاصة بهم على أنها معلومات مفيدة ومخصصة لتلبية احتياجاتهم. أخيرًا، لا تزال هناك حاجة لإجراء دراسات تكميلية لتعزيز فهمنا لأفضل السبل لدمج الصيادلة في وحدات توفير الرعاية الصحية الحالية التي تعمل حاليًا مع مرضى رعاية سرطان الثدي.