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Original Research

The effectiveness of pharmacist-based coaching in improving breast cancer-related health behaviors: A randomized controlled trial

Osama Mohamed IBRAHIM, Noha A. El-Bassiouny, Esraa Abdelhameed Dergham, Nadia Al MAZROUEI, Ahmad Z. Al MESLAMANI, Samah Bahy Mohammed Ebaed, Rana M. IBRAHIM, Adel Sadeq, Amira B. Kassem

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Abstract

Background: Although pharmacists are trusted and easily accessible by the public, their role in changing health behaviours related to breast cancer has been rarely investigated. Objective: To investigate the effectiveness of pharmacist-based coaching in improving BC-related health behaviors and knowledge in females, and to measure the comfort level toward this program. Methods: This was a randomized controlled study carried out in community pharmacies in Egypt. Pharmacies included were asked to enroll 240 females into a trial, then equally allocate them into either active or control arms, and provide 12 weekly face-to-face coaching sessions to those assigned to the active arm. Pharmacists were also asked to survey females and fill a standardized data collection form at baseline, in the middle of coaching, at the end of coaching, and three months after coaching. Results: The proportions of doing high physical activity, practicing healthy diet, and practicing breast self-exam three months after the end of coaching programme across the active and control arms were 52.17% versus 17.09% (p=0.002), 62.60% versus 28.20% (p=0.003), and 81.73% versus 23.07% (p=0.005), respectively. The mean scores of knowledge on BC symptoms, risk factors, and detection methods three months after coaching across the active and control arms were 4.10±2.47 versus 2.72±1.19 (p=0.038), 4.25±2.20 versus 3.28±1.48 (p=0.020), and .34±1.80 versus 1.72±0.68 (p=0.001) respectively. While most of the females participated in the active arm were comfortable toward the financial 94.78% and social 88.69% sides of the program, more than one-third (34.78%) of the participants were uncomfortable toward the competency of coaches. Conclusion: Despite the need for some modifications, BC-related health behaviors and knowledge can be improved through pharmacist-based health coaching.

Keywords

Pharmacist-based health coaching; Healthcare services Health coaching; Women health

Osama Mohamed Ibrahim. PhD. Department of Pharmacy Practice and Pharmacotherapeutics, College of, University of Sharjah. UAE. Department of Clinical Pharmacy, Faculty of Pharmacy, Cairo University, Egypt. oibrahim@sharjah.ac.ae
Noha A. El-Bassiouny. PhD. Clinical Pharmacy and pharmacy practice Department, Faculty of Pharmacy - Damanhour University, Damanhour, Egypt. noha.el.bassiouny.85@gmail.com
Esraa Abdelhameed DERGHAM. PhD. Clinical Pharmacy and pharmacy practice Department, Faculty of Pharmacy - Damanhour University, Damanhour, Egypt. E.drgham29601031801489@pharm.dmu.edu.eg
Nadia Al Mazrouei. PhD. Department of Pharmacy Practice and Pharmacotherapeutics, College of, University of Sharjah. UAE. nalmazrouei@sharjah.ac.ae
Ahmad Z. Al Meslamani*. MSc.College of Pharmacy, Al Ain University of Science and Technology, Abu Dhabi, United Arab Emirates. ahmad.almeslamani@aau.ac.ae
Samah Bahy Mohammed Ebaed. PhD. Clinical Pharmacology Depratment, Benha Faculty of Medicine, Benha University, Benha, Egypt. samah.benha@gmail.com
Rana M. Ibrahim. PharmD. Department of Pharmacy Practice and Pharmacotherapeutics, College of, University of Sharjah. UAE. ribrahim@sharjah.ac.ae
Adel Sadeq. PhD. College of Pharmacy, Al Ain University of Science and Technology, Abu Dhabi, United Arab Emirates. adel.sadeq@aau.ac.ae
Amira B. Kassem. PhD. Clinical Pharmacy and pharmacy practice Department, Faculty of Pharmacy - Damanhour University, Damanhour, Egypt. Amira.kassem@pharm.dmu.edu.eg

What is already known about the subject?

Breast cancer can cause severe health consequences and even death.

Behaviour changes can lower the risk for breast cancer occurrence and reduce its complications.

Pharmaceutical health services can be expanded to include patient-centered roles.

What this study adds?

Pharmacist-based health coaching can be effective in improving breast cancer-related health behaviours.

Pharmacist-based health coaching may provide an applicable and effective preventative strategy for breast cancer.

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Pharmacist-based health coaching improved knowledge on breast cancer symptoms, risk factors, and detection methods.

INTRODUCTION

Breast cancer (BC) is a global health issue, predominantly affecting women, accounting for a quarter of the new cancer diagnoses worldwide, and leading to high mortality rates, especially in low-income countries. BC may cause long-term consequences, such as chronic pain, functional and cognitive disorders, and sexual incompetence. Additionally, it can increase the risk for other cancers, cardiovascular diseases, and type 2 diabetes. In Egypt, BC is the second most common diagnosed cancer, accounts for roughly one-fifth of the new Egyptian cancer cases.[1] The most distinguish feature of BC in Egypt is that most new diagnoses are for young females,[2] which is concerning, given the lower survival rate and seriousness of the disease in such age groups.[3]

Early BC detection through regular screening could be helpful in increasing the odds of complete recovery and reducing severity of negative consequences.[4] Additionally, behavior changes including moderate to high physical activity, healthy diet, avoiding inappropriate medicines, and smoking cessation can lower the risk for BC occurrence and reoccurrence.[5] A previous systemic review comprising 17 observational studies on breast cancer prognosis reported up to 51% reduction in mortality rates when patients with high and low physical activity were compared.[6] Despite the availability of advanced information on BC prevention and management, the global incidence of the disease is still high and many patients reach advanced stages and probably die.[7] This could be attributed to several factors. First, because public' exposure to traditional awareness-raising campaigns is limited to fragments of BC information without focusing on key elements of behavior change, the outcomes of these campaigns are limited. Second, while some authors suggested remote educational approaches to prevent BC using new technologies such as social media, these approaches cannot be generalized to populations who do not have access to these technologies and even to an internet connection.[8] Third, because of lack of trust in behavior change recommendations or limited financial abilities, women are poorly adherent to behavior change recommendations.

In light of the need to a strategy that not only leads to increasing women's awareness, but also helps in integration of behavior change recommendations to their lives, health coaching is an innovative educational strategy that focuses not just on improving the outcomes of the disease, but also on patients' needs and feelings. In fact, this strategy empowers patient to take control of the decision they make as well as encourages them to deeply interact with their coaches.[9]

Unlike other healthcare professionals, community pharmacists are well positioned to deliver health coaching within an environment filled with a trusting atmosphere. Furthermore, given the flexible nature of pharmacists' workplace and roles, and in many cases lack of private spots, time constraints and accessibility issue, which are main barriers in physician-based health coaching,[10] may have a minimum influence on the feasibility and effectiveness of pharmacist-based health coaching.

Accordingly, this study aimed to investigate whether pharmacist-based health coaching can efficiently promote healthy behaviors in Egyptian females and whether adopting this model leads to a higher awareness about BC compared to females who are not involved in health coaching.

METHODS

Study design

This was a randomized controlled trial carried out in Egypt Between January 07 and June 01 of 2021. Females with specific eligibility criteria were assigned into two arms. The first arm was labeled as 'active arm' and consisted of females who were enrolled in a face-to-face health coaching programme implemented by a group of community pharmacists during their daily work duty. The second arm was labeled as "control arm" and females included in this arm were not part of the coaching programme. To measure the study outcome measures and observe behavior change in participants, females from both arms were asked to fill a data collection form at four timeslots, which were at baseline, at the middle of the programme, at the end of the programme, and after three months of the programme. For accurate reflection of the study purposes, the words "pharmacists" and "coaches" may be used interchangeably in this paper. The study was conducted according to the standards issued in the Consolidated Standards of Reporting Trials (CONSORT 2010).

Sample size calculation

While the influence of health coaching delivered by pharmacists on breast cancer-related health behaviors was scarcely known, its effect on cardiovascular risks was significant,[11] and thus, we assumed that our approach will result in 20% improvements in breast cancer-related health behaviors. Based on calculation carried out using the G*power software,[12] and considering 5% level of significance, 0.8 statistical power, and 12% attrition rate, the recommended sample size for each arm was 120 females.

The protocol of the study

Overall, this study followed six major steps organized as follows; recruitment of pharmacists, training of pharmacists, recruitment and randomization of females,

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coaching of females, assessment of outcome measures, and data management;

For the purpose of recruitment of 12 pharmacists, a random screening for community pharmacists in three major cities in Egypt was performed considering the following inclusion criteria; being licensed, having more than 3 years of experience, and working in pharmacies that easily accessible, contain private spots to communicate with patients, and has just one day off per week. However, we encountered difficulties in enrolling pharmacists who asked for financial rewards, were busy, or not interested. Therefore, pharmacists who matched the above criteria were approached using phone calls and if accepted to participate, were asked to fill a consent form.

Pharmacists enrolled in the study underwent comprehensive online training on theoretical and practical aspects of health coaching delivered by the main author of this study (an experienced coach with more than 20 years of experience in the field). Additionally, they were trained how to recruit and deal with participants. The training started with a general assessment of pharmacists' knowledge on basics of coaching. The curriculum of the training focused on the importance of body language during communication between coaches and learners, facilitative listening, and emotional support. The principle of behavior change was explained to pharmacists using the COM-B model,[13] which asserts that effective behavior change can occur only after considering the interconnection between the following key elements: The learners' physical and psychological capability, the reflective and autonomic driving factors, and the nature of the opportunity.

This trial aimed to include 240 females who needed to be adults (> 18 years), resident in Egypt, speak Arabic or English, and able to interact with coaches without support from others. Because this study focused on prevention, females with current or previous breast cancer were excluded. To avoid bias, females who were exposed to BC

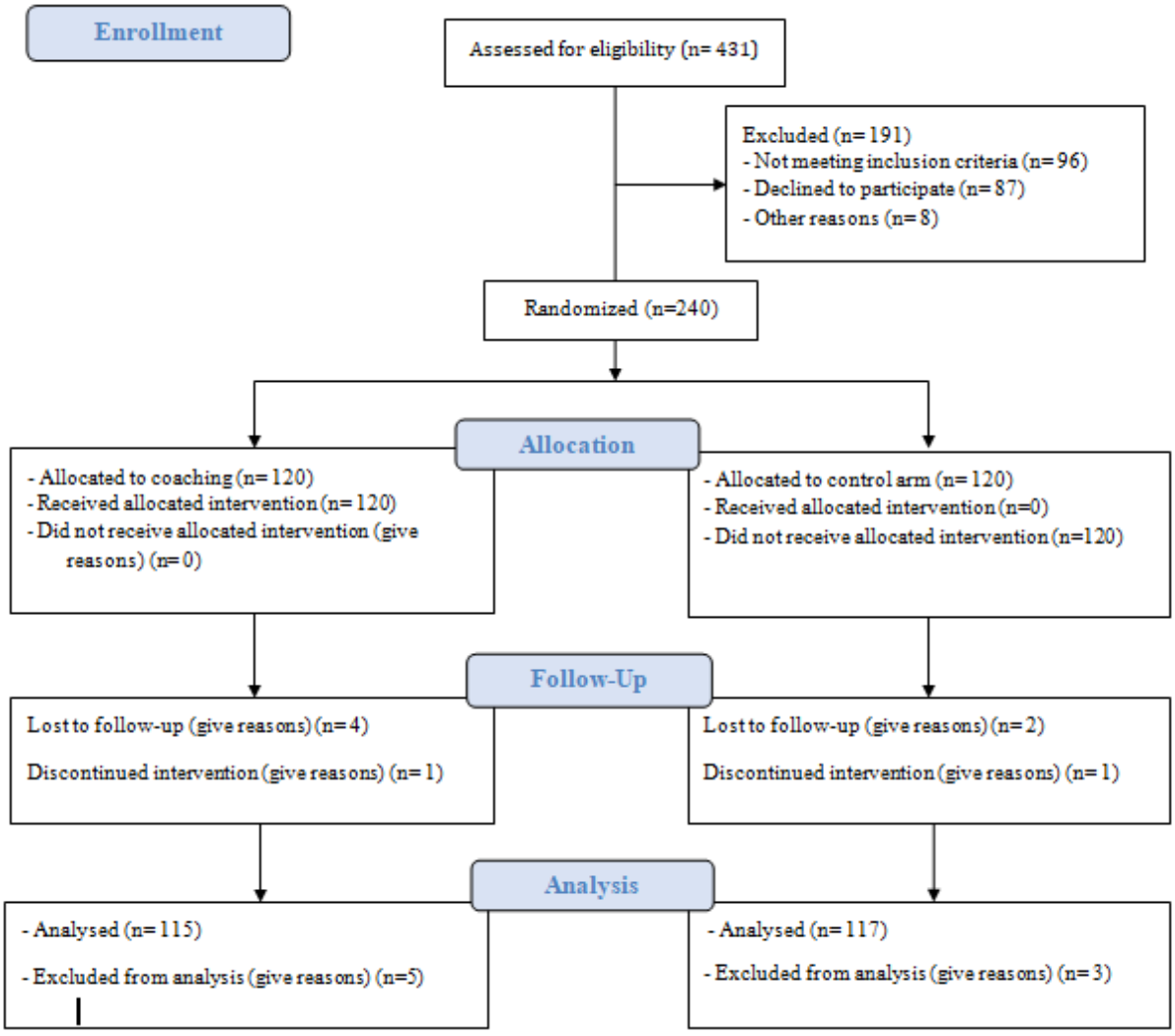

Figure 1. The flow diagram of the trial

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awareness programmes or workshops were also excluded. Therefore, each pharmacist was asked to screen its customers, recruit 20 females, explain the privacy policy of the study, and get informed consents. The names of females enrolled were coded by each pharmacist and entered into an Excel sheet (Microsoft Corp., Redmond, WA). The research team gathered all Excel sheets into a single sheet and the used the random number generator to randomize females into either active and control arm. All parties were blinded to randomization except the research team. The flow diagram of the trial was summarized in Figure 1.

Given that many participants had no access to internet facilities, the health coaching programme was designed to be delivered as12 face-to-face sessions (30-40 minutes duration) on a weekly basis inside pharmacies included in the trial. Nonetheless, precautionary measures were taken to decrease the risk for COVID-19 transmission. For practical purposes and to maintain strong communication between coaches and females, each pharmacist was asked to coach females he or she originally recruited. The coaching programme included three main components. First, coaches conveyed evidence-based coaching, which focused on the symptoms, risk factors, methods of detection and diagnosis, prognosis, and severity of breast cancer. Females were coached to do breast self-exam (BSE)based on guidelines issued by the American cancer society (ACS).[14]

Second, coaches encouraged females to connect their health objectivesto what they value the most in life. Third, coaches helped females to set realistic goals, which are prevention of breast cancer or early detection of the disease. To achieve these components, a supportive environment for authentic communication between coaches and females was created. For examples, to avoid the impact of stigma on females' involvement in the study, all coaches were females.

The outcomes of the study were assessed at four point (at baseline, at the middle of the programme, at the end of the programme, and after three months of the programme) using a standardized data collection form, which was designed after extensive literature review.The data collection, which was filled by pharmacists through phone calls with females, comprised 53 items divided into four main sections. First, sixpersonal items, which included females' age, body mass index (BMI), marital status, living area (urban or rural) educational level, and date of first period. Personal items were filled only at baseline. Second, seven health behavior items including: 1) physical activity (low, moderate, high). The taxonomy of physical activity was adopted from the Physical Activity Guidelines for Americans,[15] 2) hormonal contraceptive use, 3) healthy diet (law fat, fruit & vegetable intake), 4) smoking, 5) BSE practice, 6) breastfeeding practice (willing to practice for non-married females), and 7) mammogram test. Third, 25 knowledge items divided as follows: 5 questions about BC symptoms, 5 about risk factors, 5 about detection methods, 5 about treatment, and 5 about post-recovery rehabilitation. Two levels of knowledge weredeveloped as follows: good knowledge (those answered correctly at least 4 out of 5) and poor knowledge (≤ 3 out of 5). Fourth, 15 comfort items, which assessed on the comfort level of females toward the coaching programme (privacy, competency of coaches, spiritual comfort, financial comfort, and social comfort. These items were filled only at the end of the programme.

The data collection forms collected by pharmacists were gathered and entered into a single database by three data professionals. For accuracy purposes, an independent data professional compared the information in the database with the original forms filled out by pharmacists. The final database was sent to an independent biostatistician who used Statistical Package for the Social Sciences (SPSS) version 26 to perform descriptive and inferential statistical analysis. To measure the difference in proportions of BC-related health behaviors between the active and control arms, chi-squared test was used. To compare the means of knowledge and comfort levels, independent samples T test was performed. Findings with descriptive nature are

Table 1. Personal information of the study sample

Personal items	Total (n= 232)	Active arm (n=115)	Control arm (n=117)
Age, years			
18-24	33 (14.22)	15 (13.04)	18 (15.38)
24-29	81 (34.91)	43 (37.39)	38 (32.47)
30-39	63 (27.15)	30 (26.08)	33 (28.20)
40-49	44 (18.96)	23 (20.00)	21 (17.94)
>50	11 (4.74)	4 (3.47)	7 (5.98)
BMI, mean (SD)	26.67 (±5.63)	26.34 (±4.84)	27.01 (±6.42)
Marital status, married, yes	81 (34.91)	39 (33.91)	42 (35.89)
Educational level			
Below secondary school	44 (18.96)	21 (18.26)	23 (19.65)
Secondary school	81 (34.91)	42 (36.52)	39 (33.33)
Above secondary school	107 (46.12)	52 (45.21)	55 (47.00)
Living area			
Urban	94 (40.51)	44 (38.26)	50 (42.73)
Rural	138 (59.49)	71 (61.73)	67 (57.26)
Age at first period, years			
<13	34 (16.65)	16 (13.91)	18 (15.38)
13-15	98 (42.24)	51 (44.34)	47 (40.17)
>15	100 (43.10)	48 (41.73)	52 (44.44)
Underlying health condition, yes	42 (18.10)	22 (19.13)	20 (117.09)

Items are presented as numbers (n) and percentages (%) unless mentioned otherwise. All personal items were not statistically different across the study arms (p>0.05). BC: breast cancer

Table 2. Comparisons of health behaviours-related parameters across the study groups over four timeslots

Health behaviours-related items	Active arm (n=115)					Control arm (n=117)					
	At baseline	In the middle of coaching	At the end of coaching	Three months after coaching	*P value	At baseline	In the middle of coaching	At the end of coaching	Three months after coaching	*P value	¥P value
High physical activity	16 (13.91)	34 (29.56)	61 (53.04)	60 (52.17)	**.002**[a] .542[b]	18 (15.38)	18 (15.38)	19 (16.23)	20 (17.09)	.862[a] .684[b]	.142[c] **.042**[d] **.001**[e] **.002**[f]
Healthy diet	31 (26.95)	49 (42.60)	83 (72.17)	72 (62.60)	**.012**[a] .224[b]	28 (23.93)	31 (26.49)	29 (24.78)	33 (28.20)	.326[a] .106[b]	.088[c] **.012**[d] **.001**[e] **.003**[f]
Use of hormonal contraceptives or willing to use (for single females).	42 (36.52)	33 (28.69)	27 (23.47)	35 (30.43)	**.035**[a] **.023**[b]	47 (40.17)	45 (38.46)	46 (39.31)	49 (41.88)	.223[a] .098[b]	.081[c] **.046**[d] **.013**[e] **.001**[f]
Smoking	11 (9.56)	8 (6.95)	7 (6.08)	9 (7.82)	.135[a] .322[b]	9 (7.69)	9 (7.69)	10 (8.54)	11 (9.40)	.783[a] .236[b]	.702[c] .265[d] .086[e] .155[f]
Practice breastfeeding or willing to practice (for single females)	59 (51.03)	71 (61.73)	89 (77.39)	88 (76.52)	**.006**[a] .124[b]	64 (54.70)	66 (56.41)	68 (58.11)	70 (59.82)	.658[a] .186[b]	.132[c] .069[d] **.010**[e] **.009**[f]
BSE practice	15 (13.04)	51 (44.34)	96 (83.47)	94 (81.73)	**.001**[a] .180[b]	22 (18.80)	19 (16.23)	22 (18.80)	27 (23.07)	.702[a] .098[b]	.142[c] **.036**[d] **.001**[e] **.005**[f]
Performed or willing to perform mammogram test	4 (3.47)	5 (4.34)	5 (4.34)	6 (5.21)	.697[a] .328[b]	3 (2.56)	3 (2.56)	4 (3.41)	5 (4.27)	.897[a] .452[b]	.566[c] .423[d] .756[e] .155[f]
Willing to consult healthcare professionals on BC issues	42 (36.52)	67 (58.26)	102 (88.69)	98 (85.21)	**.008**[a] .139[b]	44 (37.60)	48 (41.02)	45 (38.46)	49 (41.88)	.522[a] .293[b]	.922[c] **.034**[d] **.001**[e] **.022**[f]

All items are presented as numbers (n) with proportions (%). *p value indicates differences within a group (i.e. active, control) (a: for differences between "at baseline", "in the middle of coaching", and " at the end of coaching": b: for differences between "at the end of coaching" and " three months after coaching".). ¥P value indicates differences between groups (c: differences in "at baseline" between active and control groups, d: "in the middle of coaching", e : " at the end of coaching", and f: " three months after coaching"). BSE: breast self-exam, BC: breast cancer, Bold values indicate significant results.

shown as numbers and percentages. The findings were considered significant if p value were less than 0.05.

RESULTS

Socio-demographic information of the study sample

Overall, 240 females agreed to participate in the study and were randomized into the active and control arms. Because five participants from the active arm and three from the control arm withdrew from the study without giving reasons, only 232 females completed the study and were included in the analysis. In total, around two-thirds (59.49%) of the participants from both groups were living in rural areas. The mean body mass index was similar in the active (26.34±4.84) and control arms (27.01±6.42) (Table 1). The differences in personal information between the study arms was not statistically significant.

Analysis of changes in health behaviors

In summary, there were statistically significant differences in all health behaviors except smoking and performing mammogram test at the end of coaching and three months after the end of coaching across the active and control arms. Precisely, the proportions of doing high physical activity and practicing healthy diet three months after the end of coaching programme across the active and control arms were 52.17% versus 17.09% (p=0.002) and 62.60% versus 28.20% (p=0.003), respectively (Table 2). Additionally, the proportions of practicing breastfeeding and BSE across the active and control arms were 76.52%

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Table 3. Analysis of changes in knowledge of breast cancer by the study groups

Knowledge-related items	Active arm (n=115)					Control arm (n=117)					
	At baseline	In the middle of coaching	At the end of coaching	Three months after coaching	*P value	At baseline	In the middle of coaching	At the end of coaching	Three months after coaching	*P value	¥P value
Knowledge on symptoms	2.81±1.12	3.59±1.95	4.26±2.38	4.10±2.47	**.001**[a] .243[b]	2.69±1.40	2.78±1.72	2.63±1.28	2.72±1.19	.563[a] .788[b]	.092[c] **.032**[d] **.011**[e] **.038**[f]
Knowledge on risk factors	3.04±1.41	4.81±2.08	4.92±1.88	4.25±2.20	**.032**[a] **.020**[b]	2.96±1.07	3.11±1.70	3.16±1.88	3.28±1.48	.402[a] .812[b]	.150[c] **.001**[d] **.003**[e] **.020**[f]
Knowledge on detection	1.68±0.98	3.69±1.88	4.69±1.88	4.34±1.80	**.025**[a] **.**182[b]	1.87±0.74	1.66±0.86	1.80±0.69	1.72±0.68	.089[a] .066[b]	.092[c] **.016**[d] **.005**[e] **.001**[f]
Knowledge on management	1.48±0.80	3.28±1.88	4.01±1.88	2.49±1.88	.**023**[a] **.001**[b]	1.60±0.96	1.71±0.41	1.69±0.58	1.54±0.73	.624[a] .155[b]	.082[c] **.015**[d] **.002**[e] **.004**[f]
Knowledge on post-recovery rehabilitation	1.78±0.92	3.38±1.88	4.08±1.88	3.42±1.88	**.006**[a] **.032**[b]	2.02±1.41	2.13±0.93	1.98±0.78	2.10±0.48	.658[a] .186[b]	.069[c] **.034**[d] **.028**[e] **.035**[f]

All items are presented as mean with standard deviation. *p value indicates differences within a group (i.e. active, control) (a: for differences between "at baseline", "in the middle of coaching", and " at the end of coaching": b: for differences between "at the end of coaching" and " three months after coaching".). ¥P value indicates differences between groups (c: differences in "at baseline" between active and control groups, d: "in the middle of coaching", e : " at the end of coaching", and f: " three months after coaching"), Bold values indicate significant results.

versus 59.82% (p= 0.009) and 81.73% versus 23.07% (p=0.005), respectively. The proportion of females who were willing to consult health care professionals on BC issues three months after coaching across the active and control arms was 85.21% versus 41.88% (p=0.022). The findings of this study showed that all significant behaviour changes in the active arm were sustained three months after coaching except the use of hormonal contraceptives, which was significantly increased from 23.47% at the end of coaching to 30.43% three months after coaching.

Analysis of changes in knowledge of breast cancer

In total, all knowledge-related items of females in the active arm were significantly improved at the end of coaching (Table 3). Nonetheless, only the changes in the mean scores of knowledge on BC symptoms and detection methods were sustained three months after coaching. Specifically, the mean scores of knowledge on symptoms and risk factors three months after coaching across the active and control arms were 4.10±2.47 versus 2.72±1.19 (p=0.038) and 4.25±2.20 versus 3.28±1.48 (p=0.020), respectively. Moreover, the mean scores of knowledge on BC detection and management across the active and control arms were 4.34±1.80 versus 1.72±0.68 (p=0.001) and 2.49±1.88 versus 1.54±0.73 (p=0.004), respectively. The findings of this study also indicated that the mean score of knowledge on post-recovery rehabilitation across the active and control arms was 3.42±1.88 versus 2.10±0.48 (p=0.035), respectively.

Analysis of females' comfort level toward the coaching programme

Approximately three-quarters of the participants enrolled in the active arm were comfortable toward the privacy (77.39%) and the spiritual atmosphere (75.65%) of the coaching programme (Figure 2). While the vast majority of females enrolled in the active arm thought that the coaching programme was financially (94.78%) and socially (88.69%) comfortable, more than one-third (34.78%) of the participants were uncomfortable toward the competency of coaches.

DISCUSSION

Because BC can result in serious short and long-term complications, and even death(4), females need to implement fundamental changes to their health behaviors. These changes can be led by community pharmacists who are trusted and easily accessible by the public.[16]

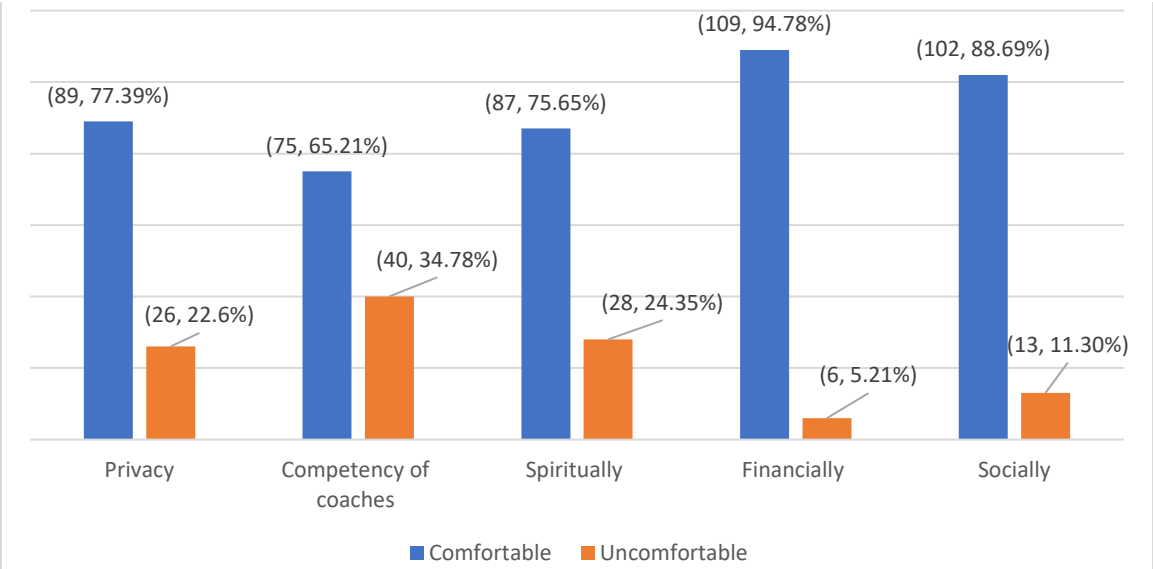

Figure 2. The comfort level of the study sample toward the coaching programme (n, %)

However, pharmacists working in community settings are required to establish new educational strategies that enable them to take on a bigger role in patient care. Therefore, our study assessed the effectiveness of a pharmacist-based health coaching program in improving BC-related knowledge and health behaviors of Egyptian females. This study tests an innovative practice that can potentially lower the risks for BC occurrence. Moreover, it offers a new insight into the advanced tasks that can be handled by community pharmacists. To our knowledge, no studies with similar aims and methods have been carried out in the region.

In this study, establishing a coaching programme for females in community pharmacies resulted in higher proportions of several BC-related health behaviors including high physical activity, healthy diet, practicing breastfeeding, BSE, and the willingness to consult healthcare professionals on BC issues. These changes were sustained three months after coaching. These findings were most likely related to the elements of coaching presented to females. For example, in addition to the benefits of these behaviors, females were coached how to practically implement these behaviors to their lives with minimum consuming of their time, money, and social connections. This might have contributed to sustaining the improvements in these behaviors. Although the use of hormonal contraceptives was considerably reduced at the end of coaching, this change was not sustained three months after coaching. The reasons behind this finding could be the fears of financial consequences of pregnancy and absence of effective and feasible replacement for hormonal contraceptives. Nonetheless, coaches shed light on alternatives of hormonal contraceptives. Our findings align with a previous study that reported a significant impact for nurse-based online telephone coaching on physical activity and diet of BC survivors.[17] However, sustaining behavioural changes was a common challenge. Jane Ogden et al,[18] suggested three factors that should be met to sustain behavioural changes. First, disrupting the function of the unhealthy behaviour and reflecting the function of the healthy behaviour into the learner's mind. Second, learners need to feel that their choice to practice the unhealthy behaviour has been reduced. Third, learners need to feel their adherence to behavioral change model. The findings of this study indicated that our coaching programme had no significant influence on smoking rate and mammogram testing rate. This could be attributed to the low prevalence of smoking among the study sample. Additionally, mammogram tests are expensive in Egypt and only performed for females with suspected BC symptoms and those with high risk factors.

In terms of females'awareness toward and knowledge of BC, several studies conducted in Egypt showed a huge lack of knowledge on BC risk factors and low prevalence of BSE practice.[19,20] The authors of these studies called for an educational approach that aligns with the females' needs and feelings, and also can be feasible and affordable. The coaching programme implemented in our study significantly increased the proportions of all knowledge-related items of females in the active arm. However, only the mean scores of knowledge on BC symptoms and detection methods were sustained. The plausible explanation for this finding is that because early detection of BC can potentially increase the chance of survival and reduce the cost of treatment,[21] females enrolled in the active arm were extensively coached how to practice BSE and discover the symptoms that may indicate the occurrence of BC. Furthermore, they were trained how to approach and consult healthcare professionals on BC issues without any fears or concerns.

Nur Zeinomar and his colleague[22] investigated the effectiveness of community-based BC educational approach in the New York state and suggested that this tool can improve the awareness of understudied females toward BC prevention. Nevertheless, the generalization of these findings is far-fetched given that public' involvement in these interventions is an untested issue. Mohsen Rezaeian and his colleagues[23] tested the impact of Health belief models (HBM) on BC-related knowledge of females above aged above 40 and claimed that this approach demonstrated a considerable efficacy. However, it is extremely difficult to make an accurate judgment on the efficacy of an educational approach without testing the sustainability of its findings, especially when testing the HBM, which the emotional, social, and cultural preferences of patients are not a priority.[24] Additionally, the comfort levels of participants were not measured in the above studies.

The females enrolled in the coaching program were comfortable toward several aspects of the program including financial, social, and spiritual aspects. Furthermore, they stated high comfort level toward the privacy provided by the coaches. While the key duties of community pharmacists have been extended in many countries to include new services, the privacy requirements have been increased to meet patient and costumer expectations.[25] Nonetheless, one-third of the females were not comfortable toward the competency of coaches. We believe that competency limitations of coaches could be attributed to the short period of training they received.

In summary, the present study may contribute to overcoming several challenges that have limited advancements in BC prevention strategies. First, the delivery of coaching by community pharmacists, who are easily accessible and their workplace facilitates the implementation of such a strategy, helps alleviating practical problems related to the place and professionals responsible for coaching. Second, given that pharmacists are trust by most of the public, we expect a higher public engagement in pharmacist-based coaching than coaching or other educational interventions delivered by other healthcare professionals. For example, pharmacists were ranked the third among the most trusted professionals in the United States (US).[26] Third, unlike this approach, females' preferences are not considered in most of the traditional BC prevention strategies.

LIMITATIONS

Overall, there were four main limitations to the current study. First, given the sensitivity of the study topic and stigma spread out in Egypt, choosing self-reporting as an outcome assessment method for our trial could introduce bias to its findings. Nonetheless, coaches offered a private environment for females and ensured that their responses will be completely confidential. Second, the follow up period in this study was up to three months after coaching, which may not be adequate to measure the impact of our approach on the occurrence of BC. Third, given that our trial was conducted in specific cities and relatively a small number of coaches were recruited, the findings presented in this study cannot be generalized to all females in Egypt. However, this was a ground work for future research that may use a bigger sample size from a different geographic location and a longer follow up period.

CONCLUSION

Pharmacist-based health coaching can improve BC-related health behaviors and knowledge in females with acceptable comfort levels. However, further studies on the sustainability of behaviour change and the impact of this approach on the occurrence of BC are necessary.

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DECLARATION OF COMPETING INTEREST

The authors declare that they have no conflict of interest.

ETHICS APPROVAL

The study was approved by The Research Ethics Committee at Damanhour University.

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