

# Does seeking knowledge of depression make a difference? A randomized study to examine the efficacy of psychoeducational intervention with patients suffering from non-psychotic depression

Adel Gabriel

## ABSTRACT

**Aims:** The primary objective of the study is to assess the efficacy of a systematic patient-centered psychoeducation program on knowledge seeking of depression and on the clinical outcomes, in patients with non-psychotic major depressive disorder. **Method:** 52 consenting patients with confirmed diagnosis of major depression were randomly assigned to a group (n = 32) who received systematized psychoeducation for depression, and to a waiting group (n = 20) who received standard care. The intervention group received systematic education consisting of (i) Reading material, “depression manual”, and (ii) individual or groups educational sessions. The primary clinical outcome measures included the clinician rated quick inventory of depressive symptomatology (QIDS-C) and the self-rated quick inventory of depressive symptomatology (QIDS-SR). Patients in both groups completed QIDS-SR, and the knowledge seeking behavior instrument (KSI), at baseline, at 4th, 8th and 12th weeks. **Results:** At 12th week, there was significant ( $p < 0.01$ ) reduction in the (QIDS-CR) and the (QIDS-SR) scores in both the intervention

and waiting group patients. However, there were significant differences between the two groups, with the superiority for the intervention group in reduction of depressive symptoms. The number of hours spent in knowledge seeking as measured by the (KSI), correlated negatively with the scores of QIDS-SR, and QIDS-CR. **Conclusion:** Systematized education may lead to significant reduction in clinical symptomatology, and to improved knowledge seeking behavior.

**Keywords:** Clinical outcomes, Depression, Psychoeducational methods, Seeking knowledge

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## INTRODUCTION

Depression is a major epidemiological concern, not only because of its high prevalence in the community but also because of its association with elevated risks of hospitalization and suicide. Over the last two decades, methods have been available to make valid and reliable assessment of the extent of depression in the community [1].

The relationship between depression literacy per se and behavior change, such as help-seeking, was examined in a number of studies. There is evidence in literature to support that patient knowledge of and attitudes towards depression and its treatment influence the choice of treatment modalities, especially antidepressant medication. For example, in a number of studies, the most frequently endorsed reasons for depressed individuals delaying or not seeking professional help or treatment was related to the lack of knowledge about mental illness and available treatments [2–4].

### **Does psychoeducation using multiple educational methods lead to favorable clinical outcome?**

It was demonstrated that utilizing multifaceted programs to target patients (n = 153) whose depressive symptoms persisted six to eight weeks after initiation of antidepressant medication, to significantly improve adherence to antidepressants. Also it was demonstrated that such programs led to satisfaction with care, and to depression outcomes compared with usual care. Also, when adherence was used as a measure of outcome, intervention groups adhered better to antidepressant medication, and were found to have a significant decrease in depression severity [5].

Also, in another study, depressed primary care patients were randomized in a clinical trial exploring the effects of psychoeducation, to assess the outcomes of utilizing three educational methods. Patients (n = 108) assigned to this method of treatment received a package of educational materials at the time of the baseline interview. These materials included two brief interactive booklets (medication booklet, behavioral health booklet) and a short video. Intervention patients were interviewed on the telephone one week after they received the package of educational materials. Approximately, three-quarters of the subjects reported that they read or viewed all of the educational products. The majority rated the products as somewhat to significantly helpful, as follows: medication booklet 81%, behavioral health booklet 82% and video 69% [6].

Other studies found significantly better medication adherence and improved clinical outcomes for those patients with major depression who received a primary care intervention that included the educational products. It was also demonstrated in a number of studies that patients who received systematic patient education and ongoing monitoring of medication adherence and depressive symptoms had high rates of use of maintenance pharmacotherapy when compared to standard care patients [7–12].

In a popular study for treating patients with depression, there was an increase in the remission rates from 3–12 months among outpatients who were treated

with a medication algorithm and patient/family education package. This package included a comprehensive patient education manual, a video, a guide for patients and families, a medication fact sheet, and regular interactive educational sessions and discussions with a therapist over a 12-week period [12].

The majority of the intervention studies used multiple approaches, and educational approaches were parts of few interventions such as counseling and psychotherapy, all of which had the same objectives of improving adherence to antidepressants to reduce relapses through enhancing the learning experiences and using educational packages such as interactive booklets, self-help materials, and short videos, and telephone counseling [13]. For example, in a large psychoeducational intervention study, patients with recurrent major depression (n = 386) were randomized to a relapse prevention program. Patients in the intervention group received two primary-care visits with a depression specialist and three telephone visits over a one-year period, aimed at enhancing adherence to antidepressant medication and recognition of prodromal symptoms, and their symptoms were monitored. Those in the intervention group showed significantly greater adherence to adequate dosage of antidepressant medication for 90 days or more within the first and second six-month periods and were significantly more likely to refill medication prescriptions during the 12-month follow-up compared with usual care controls. Intervention patients had significantly fewer depressive symptoms, but not fewer episodes of relapse/recurrence over the 12-month follow-up period [9].

Also, in a collaborative care-management program for the elderly, patients (n = 1801) were randomized into an intervention group and a usual care group for up to 12 months, with the intervention group being offered education, antidepressant management or brief psychotherapy, and problem-solving for depression. Authors reported that intervention patients had a 50% or greater reduction in depressive symptoms from baseline, less functional impairment, and better quality of life compared with 19% of usual care participants at 3rd, 6th, and 12th months [10].

### **Psychoeducational methods in depression**

Reading materials, such as leaflets, pamphlets, booklets and books, are one of the most commonly used educational methods in providing patients with the basic knowledge. These are easy to administer and distribute at low costs and needs little preparation time [14, 15]. However, attitudinal change to the illness and its treatment, reducing its stigma, and changing the behavioral domains could be achieved more effectively by using multiple psychoeducational strategies including audiovisual materials, and role modeling which are commonly presented in these educational approaches

[16, 17]. Also Counseling about drugs significantly improved adherence while leaflets on antidepressant drugs had no significant effect on adherence in patients with major depressive disorder receiving antidepressants [18]. Web-based educational resources on depression are also abundant, and the internet has the potential to deliver self-help interventions globally and to people who do not seek or receive help for depression [19]. Last but not least, some websites utilize video clips to provide patients with role models of depression such as the National Institute of mental health (NIMH) website, “Real Stories of Depression”, (<http://www.nimh.nih.gov/health/topics/depression/men-and-depression/real-stories-of-depression/index.shtml>). It was demonstrated in research that there was better medication adherence, and better clinical outcomes in patients with major depression who received primary care interventions that included educational materials such as booklets and videos [20].

The lack of strong evidence for reliability and content validity and the quality of the presented material were critically examined in literature for being too medically oriented and for being poorly patient-centered. For example in one study, views were expressed from 30 members of a self-help group of patients with depression, in which most members had concerns about the leaflets focusing on depression stigma and poor sense of self. We suggested that leaflets should reflect on patient’s experience of the condition [21]. Hence, was the decision for the development of the KSI, with acceptable reliability and demonstrated validity [22].

To the best of our knowledge, there is no published study that examined the efficacy of seeking knowledge, among depressed patients utilizing a reliable instrument to measure knowledge seeking behavior, on depressive symptomatology.

The objectives of this study was set to test the efficacy of psychoeducation on improving the knowledge seeking behavior among patients with non-psychotic depression, and to examine the relationship between the extent of time spent in seeking depression knowledge, and changes in depression symptomatology.

## MATERIALS AND METHODS

### Design

This is a randomized single blinded, prospective study, to evaluate knowledge seeking behavior and clinical outcomes of a psychoeducation intervention program for patients suffering from non-psychotic depression. Overall this study consists of a pre and posttest repeated measures design as well as between group’s comparison (intervention group and standard care group).

### Participants

Participants were adult outpatients of a community in Calgary Alberta Canada. Patients had DSM-IV clinical diagnoses of major depressive disorder, without psychotic features. Assessments were administered by independent research psychiatrist. Study data were collected between 2011 and March 2014, and patients participated for at least 12 weeks.

### Inclusion / exclusion Criteria

Both male and female consenting patients, 18–65 years of age, with confirmed diagnosis of non-psychotic major depression from outpatients only were recruited. All patients fulfilled the criteria of the MINI international neuropsychiatric interview [23], diagnosis was confirmed by an independent research psychiatrist, and all patients were administered SSRIs or SNRIs antidepressants treatments. For the purpose of this study, only patients who suffered from mild to moderate scores severity between 7 and 22 on the QIDS-C were included [24–26]. Excluded from the study; patients with severe depression scores or suicidal patients, those who were not able to provide an informed consent, patients with psychotic symptoms, and patients with mental handicap. Also patients with unstable medical conditions, and pregnant women were excluded. The conjoint scientific and ethics board of the University of Calgary granted approval for the study.

## PSYCHOEDUCATIONAL INTERVENTION

### Randomization and procedure

Patients were randomly assigned into two groups, the intervention care group and the standard care group, (waiting group). All patients in both groups were treated by serotonin reuptake inhibitor (SSRIs) or serotonin norepinephrine reuptake inhibitor (SNRIs) antidepressants. Follow-up: All patients in both the intervention and the regular care received maintenance of antidepressant, and ongoing monitoring of medication management, via regular visits with the research psychiatrist for 12 weeks at least (at least four visits, 30 minutes each).

### Components of educational methods

Multiple educational methods will be used in order to maximize the learning gains. Models that encourage active participation of patients in their learning were used, such as presenting them with a problem and asking them to solve it, a video presentations during group discussion which were facilitated by a psychiatrist. The three educational domains (cognitive, behavioral and attitudinal) are targeted by providing the following;

1. All patients received reading material “The depression manual”. This educational method was developed to target the cognitive educational domain. The content of the manual was developed from reviewing trusted websites of patient education on depression.
2. Group psychoeducation: Active participation in group psychoeducational sessions emphasizing reflection and feedback through discussions facilitated by a therapist (5–8 patients each, 6 sessions, once weekly, 60 minutes each). During group sessions, audio-visual material portraying cases of depression emphasizing role modeling were used. This psychoeducational method is designed to target the affective and attitudinal component, to achieve changes in attitudes to depression and its treatments, and to teach strategies of self-management of day to day stress and management of their own medication appropriately.
3. Individual educational sessions, by the research psychiatrist (in total, six visits, and 30 minutes each).

The standard care group (waiting group), were followed by the research psychiatrist, received standard care for major depression, including antidepressants, and counseling as necessary. These patients had the choice of receiving the educational program, should they wish, after the trial has been completed (12 weeks).

All patients completed at least six visits with the research psychiatrist during the trial period.

Patients in both groups (psychotherapeutic intervention or waiting) were treated by SSRIs or SNRIs antidepressants, and were followed by their psychiatrist once every four weeks, to review antidepressant treatments and addressing their educational and treatment concerns. Patients randomized to the educational intervention group were required for the purpose of this study, to complete at least attendance of four group sessions, or six individual educational sessions with the research psychiatrist.

## Evaluation and assessments of clinical outcome

### The primary efficacy assessments

The QIDS-C and the QIDS-SR were utilized as the primary clinical efficacy measures [27, 28]. Response was defined as >50% reduction in baseline score in any of these inventories. Both QIDS-C and QIDS-SR were completed at baseline, at 8th week, and at 12th week, for all patients in both the intervention and the waiting groups. The QIDS-CR, was completed blindly by an independent research assistant. All patients in both the intervention and waiting groups completed (QIDS-SR and (QIDS-CR) at baseline, at 4th, 8th and 12th weeks.

## The Knowledge Seeking Instrument

This domain was measured by utilizing a three-item instrument developed by us in a previous study. The instrument demonstrated acceptable reliability (internal consistency reliability of 0.67). There was also evidence for content validity (68% agreement among experts for the items being relevant to measure knowledge-seeking behavior in depressed patients), convergent validity, and criterion related validity [22]. In addition, this instrument is very short and easy to administer in any clinical setting among patients suffering from depression, especially in the outpatient. This instrument was applied to all patients in both groups at baseline, at 4th, 8th, and 12th weeks. This measure was completed by the waiting group in order to avoid bias of the fact that some patients may also seek and gain depression knowledge from other non-systematic sources.

## Data Analysis

The paired *t*-test, the repeated measures multivariate analysis of variance (rep-MANOVA) were utilized to assess changes over time in depressive symptoms as measured by QIDS-C and QIDS-SR. The Spearman's correlation, was utilized to examine the relationship between changes in KSI and QIDS scores over time. The statistical package for social science (SPSS) was used to analyze data. The data are described in terms of means and standard deviations for continuous variables, and as frequencies and percentages for the non-continuous variables, for the demographic data.

## RESULTS

Completed the 12th-week study ( $n = 32$ ) patients, randomized to the intervention an groups and ( $n = 20$ ) randomized to the waiting group. Table 1 gives the demographic variables for both groups. Fifteen patients completed group sessions with a clinical educational psychologist, and seventeen patients attended individual educational sessions with a psychiatrist. All patients attended their psychiatrists to address standard treatments and the administration of antidepressants. The internal consistency reliability of knowledge seeking (KSI) instrument was reviewed in this study. The Cronbach's alpha measure was 0.72 at baseline (Tables 1 and 2).

### Depressive symptomatology QIDS-CR and QIDS-SR

Patients in the two groups, showed significant improvement in depressive symptomatology as measured by the QIDS-SR and QIDS-CR inventories of clinical symptomatology scales.

Table 1: Demographics of patients in the intervention (n = 30) and the waiting (n = 20) groups

Categorical Variables	intervention group (n = 32) (Frequency, Percentages)	waiting group (n = 20) (Frequency, Percentages)
SEX		
Male	14 (44)	9(45)
Female	18 (56)	11(55)
STATUS		
Single	10(31.3)	5(25)
Married	10(31.3)	9(45)
Divorced	8(25)	5(25)
Separated	2(6.3)	1(5)
widow	2(6.3)	0
RACE		
Caucasian	30(94)	12(60)
No-Caucasian	2(6)	8(40)
EDUCATION		
School education	17(53)	16(80)
University education	12(37.5)	4(20)
Higher education	3(9.5)	0
OCCUPATION		
Professional	7(22)	1(4.5)
Entrepreneur	6(18.8)	0
Skilled	6(18.8)	6(30)
No-skilled	12(37.5)	3(15)
unemployed	1(3.1)	10(50)

Table 2: Comparing the continuous variable demographics of the intervention (n = 32) and the waiting (n = 20) groups

Continuous variable	intervention group (n = 32)		waiting group (n = 20)	
	min-max	M (SD)	min-max	M(SD)
Patient age	21–65	44.5(12)	27–65	46.0(11.7)
Duration of depression (months)	2–180	52(40)	4–240	67.0(65.0)
Number of visits with psychiatrist over 12 weeks	3–10	5(1.7)	0–7	3.0(1.6)

Paired sample *t*-test was employed to examine and compare changes in the mean depressive symptomatology QIDS-SR, and QIDS-CR at 12th week, from baseline, in the two groups. There was significant reduction ( $p < 0.001$ ) in depressive symptomatology measures in both groups.

The general linear model, multivariate analysis of variance was utilized to examine the difference in depressive symptomatology changes between the intervention and waiting groups. Table 3 and Table 4 compare changes describe the changes in scores of QIDS-SR, and QIDS-CR in both groups (the educational intervention and the waiting).

A close inspection of Table 3, there is significant difference ( $p < 0.1$ ) between the two groups, in QIDS-SR scores, the primary outcome measure at 4th, 8th and 12th weeks. Also there is significant differences in QIDS-CR scores between the two groups, at 4th week ( $p < 0.04$ ), and at 12th week ( $p < 0.01$ ) of treatment. There were no significant differences between the two groups in age, duration of depression, and length of the most recent episode or the number of times they received standard psychoeducational visits with a psychiatrist.

There were significant positive correlations between QIDS-SR and QIDS-CR scores at baseline, at 4th, 8th, and 12th weeks  $r = 0.6, 0.66, 0.76, 0.75$ , respectively with  $p < 0.001$ .

Table 3: Comparing changes in depressive symptomatology, self-rated (QIDS-SR), in the intervention group (n = 32) and the waiting (n = 20) group

Changes in the two groups	Mean (SD)	95% Confidence interval		$p <$
		Upper bound	Lower bound	
QIDS-SR baseline	Educational 15.4(4.6) intervention 17.5(4.0) Waiting group	17.0 19.4	13.9 15.5	0.11
QIDS-SR 4th week	Educational 12.1(5.5) intervention 15.5(5.0) Waiting group	14.0 17.9	10.2 13.0	0.01
QIDS-SR 8th week	Educational 9.8(5.5) intervention 13.1(5.2) Waiting group	11.8 15.5	8.0 10.6	0.01
QIDS-SR 12th week	Educational 8.4(4.9) intervention 13.5(6.0) Waiting group	10.3 16.0	6.6 11.2	0.01

Table 4: Comparing changes in depressive symptomatology, clinician-rated (QIDS-CR) between the intervention group (n = 32) and the waiting (n = 20) group

Changes in the (QIDS CR),	Mean (SD)	95% Confidence interval		$p <$
		Upper bound	Lower bound	
QIDS-CR baseline	Educational 14.1(3.6) intervention 15.1(3.5.0) Waiting group	15.3 16.8	12.9 13.6	0.26
QIDS-CR 4th week	Educational 11.1(5.7) intervention 13.4(3.5) Waiting group	12.3 15.1	9.7 11.7	0.04
QIDS-CR 8th week	Educational 9.5(4.1) intervention 11.3(3.8) Waiting group	11.2 12.7	8.3 9.1	0.32
QIDS-CR 12th week	Educational 7.6(3.0) intervention 11.3(4.5) Waiting group	9.0 12.7	6.4 9.4	0.001

Repeated measures multivariate analysis of variance (rep-MANOVA)

### Knowledge seeking behavior

Patients in the educational intervention group followed the educational program for 12 weeks, while patients in the waiting group have reported seeking knowledge on their own accord, by using varied educational means. Reading material of depression, was the most commonly utilized educational method among the intervention group (mean: 14.8 hours. sd: 9.1, df: 31), while surfing the internet was the most commonly used method among the waiting group (mean: 6.0, sd: 11.2, df: 19).

Table 5 gives the differences between the intervention and waiting groups in utilizing the three educational methods. A close inspection of this table, there is significant differences ( $p < 0.1$ ) between the overall time spent in utilizing one or more of the educational methods, and there were significant differences ( $p < 0.1$ ) between the two groups in the mean time spent on reading or in using audiovisual material.

Table 5: Comparing total number of hours spent in all domains of seeking knowledge among the intervention group (n = 32) and the waiting group (n = 20) group

Timeline changes in the two groups (total number of hours of knowledge-seeking behaviour)		mean (SD)	95 % Confidence interval		p <
			Upper	Lower	
Knowledge-seeking baseline	Educational intervention	8.3(13.4)	12.1	4.4	0.01
	Waiting group	2.3(3.7)	7.1	2.5	
Knowledge-seeking 4th week	Educational intervention	10.0(11.8)	13.5	6.3	0.01
	Waiting group	3.0(6.5)	7.5	1.5	
Knowledge-seeking 8th week	Educational intervention	9.6(11.1)	12.8	6.4	0.01
	Waiting group	2.4(4.0)	6.5	1.6	
Comparing hours spent in each domain of seeking knowledge among the intervention group (n=32) and the waiting group (n=20) group					
Reading (hours)	Educational intervention	14.8(9.2)	17.5	11.8	0.01
	Waiting group	3.2(4.0)	7.0	0.14	
Surfing (hours)	Educational intervention	11.5(13.0)	16.0	7.0	0.2
	Waiting group	6.0(11.3)	12.2	0.75	
Audio-visual (hours)	Educational intervention	6.4(8.0)	8.5	4.0	0.01
	Waiting group	1.5(2.0)	4.7	1.2	

There were no significant differences between the two groups in age, duration of depression, and length of the most recent episode or the number of times they received standard psychoeducational visits with a psychiatrist.

### The relationship between knowledge seeking and changes in depressive symptomatology

The Spearman’s correlational analyses was carried out, to examine the relationship between the mean number of hours spent in seeking depression knowledge using any of the three methods, and changes in depressive symptomatology over 12 weeks.

A close inspection of Table 6, there is significant inverse relationships, (negative correlations) between the severity of depressive symptomatology QIDS-SR, and QIDS-CR over time, and the overall number of hours spent learning about depression and its treatment, suggesting that individuals who sought more knowledge about depression and its treatments were likely to present with less symptoms on the QIDS-SR, and QIDS-CR.

Table 6: Pearson product moment correlations between time spent in knowledge seeking and changes in depressive symptomatology at 8th and at 12th weeks of treatment in the two groups (n = 52)

Variables over Time	Knowledge seeking (at baseline)	Knowledge seeking-4th week	Knowledge seeking-8th week	Knowledge seeking-12th week
(QIDS-SR) baseline	-0.14	-0.13	-0.10	-21
(QIDS-SR) 4th week	-0.20	-0.26	-0.20	-0.31*
(QIDS-SR) 8th week	-0.20	-0.28*	-0.16	-0.32*
(QIDS-SR) 12th week	-0.38**	-0.24**	-0.28*	-0.43**
(QIDS-CR) baseline	-0.17	-0.13	-0.05	-0.13
(QIDS-CR) 4th week	-4.0**	-0.45**	-0.34*	-0.41**
(QIDS-CR) 8th week	-34*	-28*	-0.21	-0.40**
(QIDS-CR) 12th week	-0.40**	-46**	-40**	-0.50**

\* Correlation is significant at  $p < 0.05$  level (2-tailed).

\*\* Correlation is significant at  $p < 0.01$  level (2-tailed).

### DISCUSSION

This was a randomized single blinded study to examine the clinical outcomes of systematized depression education in patients with non-psychotic depression. The extent of knowledge seeking as measured by the number of hours spent in learning about depression was measured by an instrument with an established acceptable reliability from a previous study, and with evidence for validity [22].

Patients in the intervention group received a systematic education about depression utilizing multiple educational methods, utilizing reading material, were

involved in discussions, and reflection on their experience either in groups or on an individual basis. The waiting group patients, although did not receive such systematic education, some were motivated and managed to learn about depression on their own from different educational sources. The intervention group have significantly utilized more time in learning and seeking depression knowledge, and were significantly less symptomatic than the waiting group.

The rationale behind using multiple educational methods is justified by the fact that individuals have different preferences for learning referred to as learning styles [27].

The behavioral (i.e., psychomotor) aspect represents an essential learning domain of the learning theory [28]. In this study, I selected the behavior of patient knowledge seeking of depression and its treatment, as the psychomotor educational domain. Assessing and measuring the behavioral aspects of knowledge seeking among patients is considered as an integral part of assessing depression literacy, because it reflects, not only the motivation to seek different treatment modalities, but also that they have internalized and acted on their desire to learn by seeking knowledge about depression and its treatment. In this study, I utilized the first developed instrument to measure knowledge seeking, with established acceptable reliability, and with evidence for validity [22], in order to examine the relationship between KSI scores and depressive symptomatology measures QIDS-SR, and QIDS-CR in more depth.

There are number of studies which examined the relationship between help seeking, and knowledge of depression. However, these studies did not utilize reliable instruments with evidence for validity, to measure the relationship between knowledge seeking and clinical improvement, which I aimed at in the current study. In the current study, the KSI, was utilized to examine the extent of seeking depression knowledge by patients, in a systematic fashion.

It was, reported that 55% of subjects who fulfilled the research diagnostic criteria of major depression did not seek help. The non-help seekers did not consider the episode serious, or could not recognize it as an illness, and believed that they could handle the episode themselves. On the other hand those who sought help, felt that the episode was too painful, lasted too long and caused disruption of their interpersonal, and role functioning [2]. The relationship between depression literacy per se and behavior change such as help seeking among patients was examined in a number of studies, which supports the evidence that patients' knowledge and attitudes towards depression, and its treatment influence the choice of treatment modalities especially antidepressants medication and play a role in stigmatizing people with depression [29–31]. For example, in one large study ( $n = 2010$ ), respondents who had poor knowledge as shown in recognizing health problems in a vignette were less likely

to recommend treatment from a counselor, psychologist or a psychiatrist, and some considered psychiatrists as harmful [29].

In the present study, although patients in the waiting group did not follow a systematic depression education, their educational activities and their symptoms were monitored and were measured systematically by the same instruments and at the same intervals as this was measured in the intervention group. In this manner, researchers were be able to compare the changes in symptoms associated with systematic education with those associated with no-systematic education as this might takes place in real life situation.

It was demonstrated in literature that despite increased professional contact by those with major depression and suicidal ideation, there were few differences among three groups (depression with suicidal behavior, depression without suicidal behavior, and a control group) on either open-ended or direct questions related to mental-health literacy. This suggests that increased professional contact in itself was not related to increased mental-health literacy and that more specific psychoeducational programs are required [2]. This supports the findings in the present study that the number of visits to the psychiatrist did not seem to have statistically significant impact on depressive symptomatology scores, or the mean scores of knowledge seeking, as did the exposure to the systematic education over time. However, these results need to be examined in larger studies.

### **Limitations of Psychoeducational Programs in Depression**

The sample size was not large. Future research should include large sample size. The limitations of the knowledge seeking instrument include the problem of recall bias due to collecting information from the past four weeks, which could not be very precise. Also, it could be argued that the favorable outcomes shown in psychoeducation, were in fact the result of the other psychiatric treatments administered, e.g., antidepressant medication or psychotherapy offered by some websites, especially those utilizing self-administered online cognitive behavior therapy. Alternatively, it could be argued that the favorable outcomes shown in the psychoeducational intervention group, were in fact the reflection of the high patients' motivation, their adherence to antidepressants and their eagerness to learn. For example, in one study, patients who received systematic patient education and ongoing monitoring of depressive symptoms and adherence via telephone had higher rates of use of maintenance pharmacotherapy and better outcomes when compared to standard care patients [11]. Overall, the evidence remains weak for relating the favorable clinical outcome to an educational program, and this will need to be replicated in larger studies.

## CONCLUSION

Systematic patient education about depression utilizing multimodal methods including reading material, audiovisual resources, and internet surfing was found to be associated with significant reduction in clinical symptomatology. In the current study, there is evidence to support that patients who sought more knowledge were more likely to present less depressive symptomatology over time. However, it is less clear if such positive clinical outcomes such as reduction in the severity of symptoms are closely related to seeking knowledge of depression.

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## Author Contributions

Adel Gabriel – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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