Assessment and Management of Biopsychosocial and Educational Needs: Developing and Implementing Educational Guidelines for patients with Multiple Sclerosis

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Abstract

Background : Multiple Sclerosis (MS) is a chronic illness that causes physical, cognitive, and psychosocial problems. Patients should be educated in conjunction with biopsychosocial evaluation and management. **The objective of this work** was to assess the effect of implementing educational guidelines on meeting biopsychosocial and educational needs of patients with multiple sclerosis. **Research design:** A quasi-experimental design (pre-post and study-control group) study was utilized to meet the objective of this study and investigate study hypothesis. **Setting:** At MS outpatient clinic affiliated to Ain Shams University Hospital, Cairo, Egypt. **Subjects:** For this investigation, a sample of eighty adult patients was selected from the previously described settings, and 40 patients were randomly allocated to each of the two equal groups (the study and the control). **Results:** There was a significant increase of total satisfactory level of knowledge at post-implementation phases among study group at p≤ 0.001 as compared to control group participants. There was a highly significant reduction of overall physical symptom alteration among study category as compared to control one patients post implementation at p <0.001. Significant improvement of the level of dependency among study group as compared to control group after educational implementation at p =0.005. Also, there were significant reductions among study group subjects in comparison to controls regarding total mean scores of depressive, anxiety, and stress symptoms at post implementation (p= 0.009, 0.024 & 0.027 respectively). Moreover, the findings revealed significant reduction regarding total mean scores of social alterations among study group as compared to controls at post implementation phase at p=0.039. **Conclusion:** the educational guidelines were effective in improving knowledge, self-care practices, physical alterations, level of dependence, psychosocial alterations among study group in comparison to controls after its implementation. **Recommendation.** dissemination of study Arabic booklet suggested to developed and available for all cases with MS.

Keywords: Biopsychosocial, Educational Guideline, Educational Needs Multiple Sclerosis.

Introduction

Multiple sclerosis (MS) is the most common neurological disability, it is an autoimmune disease that impacts the central nervous system (CNS). It is the most prevalent chronic debilitating illness of the CNS in young adults, affecting 2.3 million individuals globally. Females are twice as likely as males to have it, and it often manifests at an early age. It often results in severe physical or cognitive and neurological complications in young adults that results in the formation of CNS plaques including inflammatory cells and their products, demyelinated and transected axons, and astrogliosis in both white and gray matter. Such lesions may cause neuronal dysfunction, including autonomic and sensory, motor abnormalities, visual disturbances, ataxia, exhaustion, difficulty thinking, and emotional issues. They may also interfere with proper nerve transmission. **(Ghasemi et al., 2017)**.

The exact cause of multiple sclerosis is still unknown, but it is believed that a mix of genetic and environmental factors trigger autoimmune reactions against CNS structures, causing damage of tissue and neurological disorders. There are three primary subtypes of MS, including relapsing-remitting MS (RRMS), which accounts for 85% of cases and is the most prevalent form of the disorder; secondary-progressive MS (SPMS) is initially a relapsing-remitting course that then starts to cause the progressive progression of disability; and primary progressive MS, which is less prevalent and is progressive

from the start **(Baecher-Allan et al., 2018; Klineova & Lublin, 2018)**

The overall progression of multiple sclerosis, the type and severity of the symptoms that each patient experiences, and the disease's prognosis are all unexpected. The location and degree of lesions within the CNS determine the wide range of symptoms associated with multiple sclerosis (MS). Multiple sclerosis (MS) is characterized by a wide range of physical problems that can significantly impact a person's daily life, including walking difficulties, muscle spasms or weakness, fatigue, mood swings, cognitive changes, physical spasticity, bowel/bladder dysfunction, sexual dysfunction, visual defects, affective disorders, cognitive impairment, emotional burden, and diminished physical functioning. Anxiety and sadness are also more common among MS patients. **(Ghasemi et al., 2017; Marck et al.,2018).**

Physical limitations caused by MS, such as weakness, spasticity, tremors, and coordination issues, as well as cognitive deficits, limit involvement (job, social integration, and family duties). These limitations and restrictions worsen over time, causing anxiousness and isolation for the patient and his or her family **(Goverover et al., 2017).**

Living with chronic disease necessitates adapting to the pressures of unending symptoms such as pain, exhaustion, sadness, and worry. While recovery is the intended goal of disease, for persons with chronic disease, the more realistic outcomes may be that of maintaining physical and psychosocial well-being in the face of these persistent demands on fitness. **(Singh et al., 2016).**

Currently, there is no known cure for MS. Its management aims to manage the condition while also giving symptomatic relief. Nurses play an important role in the management regimen of MS patients because they give treatments that can minimize flares and improve neurologic impairments. They advise MS patients to maintain an active lifestyle, avoid exhaustion, and practice stress management to strengthen their immune systems and lead regular lives. It's critical to understand the physical, social, and psychological well-being of MS patients as well

as how they cope with and adjust to the physical disruptions caused by their illness and the variables that either support or impede their ability to adapt. **(Dymecka & Bidzan, 2018).**

Assessing the biopsychosocial requirements of individuals with chronic debilitating diseases is critical for assisting them in coping with challenges and understanding human health and illness. The evaluation should be carried out with the goal of adjusting the home environment to help recovery, with special consideration given to the willingness and capacity of family and social networks to provide support throughout rehabilitation. Biopsychosocial management and recommendations should be adapted to the patient's needs. **(Chun et al., 2019).**

Significance of the research:

MS is a silent killer not only for the lives of MS patients but also for the route of community development, since it is the second most prevalent cause of physical disability in young people. The condition most typically affects persons between the ages of 20 and 40, during their most productive years, promptly inhibits their job ability, resulting in severe physical, emotional, social, and economic implications **(Ibrahim, 2018)**. According to the Ministry of Health and Population, MS accounts for 1.4% of all neurological illnesses in Egypt. According to the most recent Atlas of MS, there are 2.8 million individuals living with MS worldwide. According to data released in 2020, over 59,670 persons in Egypt have MS. This is one in every 1,500 persons **(Walton et al., 2020)**.

Patients suffering from debilitating diseases such as multiple sclerosis face several challenges as a result of their disease, which has a negative impact on their overall biopsychosocial well-being and quality of life. For MS patients, there is a considerable gap between obtained and necessary information; this indicates that training based on needs assessment can give more efficacy; additionally, training based on needs assessment saves cost, time, and labor. Training without a needs assessment is ineffective and increases health-care expenses. Nurses, on the other hand, spend a significant amount of time with MS patients, whose requirements in all parts

of the care process must be evaluated and managed. (**Dehghani et al., 2012**).

The positive effect of educational interventions emphasizing on either psychological, physical, or social/interpersonal components of patients with MS, there has been little debate regarding the establishment of management of any educational activities based on the disease's bio-psycho-social model (**McGuire et al., 2015 & Donisi et al., 2021**). Despite the fact that several investigations on the education of patients with MS have been conducted, these studies lack the adoption of biopsychosocial needs evaluation and management of these patients, as well as the planning of educational activities to fulfill and manage these requirements. As a result, the current study was conducted to discover what the educational needs of patients with multiple sclerosis are in physical, social, and psychological aspects.

Aim:

The current study aimed to assess biopsychosocial and educational needs of patients with MS then develop and implement educational guidelines based on these needs to evaluate its effect through the following aims.

1. Assess physical, psychological, social and educational needs among patients under study.

2. Develop and implement patients' educational guidelines based on biopsychosocial and educational needs assessment of patients under study.

3. Evaluate the effect of developed patients' educational guidelines on physical, psychological, social, and educational needs of patients under study.

Research hypothesis:

The following hypothesis was tested in this study:

H1. Educational guidelines will statistically significantly increase knowledge of study group patients in comparison to controls after implementation.

H2. Educational guidelines will statistically significantly improve self-care practices of study group patients as compared to controls after implementation.

H3. Educational guidelines will statistically significantly improve the physical needs of study group patients in comparison to controls after implementation.

H4. Educational guidelines will statistically significantly improve psychological needs of study patients in comparison to controls after implementation.

H5. Educational guidelines will statistically significantly improve social needs of study group in comparison to controls after implementation.

Operational Definitions

- **Educational guidelines** in this study relate to the formulation of educational guidelines based on social, psychological, physical, and educational requirements, with the goal of addressing these needs by limiting alterations.

- **Biopsychosocial needs** in this work means physical, psychological, and social alterations that need to be met among patients under study.

- **Educational needs** in this study refer to the need for knowledge regarding MS disease, its management in addition to self-care practices.

Subjects and Methods:

This section for this research were illustrated under four major designs as the following:
  I. Technical.
  II. II. Operational.
  III. III. Administrative.
  IV. IV. Statistical.

I-Technical design:

This section included the following;

Research Design:

A quasi-experimental design (pre-post and study-control group) study was utilized to meet the objective of this work and investigate study hypothesis. This study design, which involves observing one or more group participants before and after manipulations, becomes crucial given the nature of the research topic (**Creswell, 2012**).

Setting of the study:

The study was established at MS outpatient clinic affiliated to Ain Shams University Hospital, Cairo, Egypt. The MS outpatient clinic receives patients weekly from Saturday to Wednesday. This clinic provides follow up care for patients with multiple sclerosis, either newly diagnosed or old diagnosed patients. It serves as a specialized MS unit that provides out-patient care for patients with multiple sclerosis from near and far districts in Cairo governorate.

Subjects:

A sample of eighty adult patients was recruited from the above-mentioned settings and categorized into two equal groups (study and control) 40 patients in each based-on sample size equation. *Inclusion Criteria:* Adult (≥ 18-years old), cases diagnosed with MS (maximum two years after diagnosis confirmation, willing to participate, able to ambulate, communicate, can read, and write and did not receive previous educational program or training about multiple sclerosis. *Exclusion criteria:* patients had ongoing exacerbation of multiple sclerosis. had other co-morbid serious chronic illnesses and end-stage disease and cases with disturbed level of consciousness/ or mental illness.

Sample size:

Study participants include adult patients with definite diagnosis of multiple sclerosis with selective inclusion criteria. Based on sample size equation, the number of patients was 40 patients in each group. The sample size was determined by setting the test's power to 80%, the confidence interval to 95%, and the acceptable margin of error to 5%. Using the following equation (**Machin et al., 2018**).

Type I error (α) = 0.05% Type II error (B) = 0.20%

With power of test 0.80%

$$n = \frac{N \times p(1-p)}{\left[\!\left[N - 1 \times \left(d^2 \div z^2\right)\right]\!\right] + p(1-p)}$$

Nxp(1-p)　　=(100*(0.5*(1-0.5)))/
N-1　　　　=(100-1)*
d^2/z^2　　　=0.0025 / 3.8416+
p(1-p)　　　=0.5*(1-0.5)
n　　　　　=80

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96

d= the error rate is equal to 0.05

p= Ratio provides a neutral property = 0.50

Tools of the study:

Data were collected by:

1- Patient structured interviewing survey:

It was prepared in a basic Arabic language and completed by the researcher and based on recent literature; it involved four parts.

The first part investigated the demographics of the patients including gender, age, education, social status, employment, residence in addition to adequacy of cost of health care. It contains nine multiple-choice questions and closed ended questions.

The second part was concerned with assessment of patients' medical data includes information regarding MS disease pattern, duration of illness, number of attacks of exacerbations in last year**,** history of chronic illness, family history and body mass index.

The third part was focused on assessment of knowledge of patients regarding multiple sclerosis and its treatment, this part was designed based on related literatures **(Giordano et al., 2010; Hudaif et al., 2014; Abulaban et al., 2019).** It includes assessment of patients' knowledge regarding multiple sclerosis, its definition (2 questions), causes (4 questions), types (3 questions), manifestations (5 questions), diagnostic measures and follow up (4 questions), complications and exacerbation (5 questions), and disease management including drug management, diet management, activity management, dealing with exacerbations, symptom management (24 questions) with total 47 questions. It includes multiple choice and true/false questions.

Scoring system

The correct choice was scored one grade and zero was provided to the incorrect one with a total score of 47. The total score was summed up, percentage was estimated. The overall level of knowledge was classified into two levels; satisfactory level at total score was ≥75% (35

grades) and unsatisfactory level at total scores < 75% (35grades).

The fourth part was focused on assessment of reported self-care practices, this section was designed based on related literatures **(Maslakpak & Raiesi, 2014; Afrasiabifar et al., 2016).** It includes assessment of patients' self-care practices about multiple sclerosis, including drug management (9 questions), diet management (7 questions), activity management (7 questions), dealing with exacerbations (6 questions), symptom management (8 questions), follow up (5 questions). The sum of total items was 42 items. It includes multiple choice and true/false questions.

Tool II- Patients 'needs assessment tool.

This tool was created based on reviewing the relevant literature. This tool was used two times, before and after educational guidelines implementation. It consisted of three parts covering the physical, psychological, in addition to social needs assessment as following:

First part focused on assessment of physical needs.

It was composed of two sections A and B:

- **A-Physical needs assessment which was concerned with assessment of severity of physical symptoms and functional alteration due to effect of disease.**

It was formulated based on guidance of relevant researchs **(Wittink, 2008; Green et al., 2017; Eladham, 2018).** Each patient was asked to report symptom and functional alterations in the last week with a yes/ no response. It consisted of 10 main symptom domains including motor symptoms (8 items), sensory alteration (6 items), visual disturbances (6 items), speech and swallowing problems (9 items), bladder/bowel alterations (8 items), cognitive disturbances (6 items), gastrointestinal disturbances (7 items), sleep disturbances (5 items), fatigue assessment (10 items) and pain assessment (10 items) with total 75 items.

Scoring system

Each alteration as reported in a yes response received one grade and absence of alteration got zero with total score 75 grades which indicate high alteration. The sum alterations of each domain were summed and total mean scores for each symptom domain /all systemic alterations were attained. The higher the mean scores, the more severe the symptoms.

B- Physical needs assessment regarding performance of daily life activities using Barthel index scale.

The Barthel index scale is a standardized one to investigate functional status as a measurement of the ability of a patient to independently perform activities of daily living. The tool also assesses the level of assistance needed. Thus, it is used for measuring functional disability. It is adapted from **Liu et al. (2015).** Barthel Index Scale (BI) includes ten variables describing daily life activities and mobility involving bathing, feeding, dressing, grooming, bladder and bowel control, toileting, ambulation, chair transfer, and stair climbing. Translation and retranslation was done to ensure its validity.

Scoring system

Each item is scored as 0 to 5, 0 to 10, or 0 to 15, based on the function. The range of total scores is zero-100. According to the score of each patient, level of independence is determined. The degree of functional independence increases with score. Total scores of 10 items are classified for dependency as following; 0-20 refers to "total", 21-60 reflect "severe", 61-90 indicate "moderate" and 91-99 indicates "slight" dependency.

Second part assessed the psychological needs of patients using anxiety, depression, and stress scale (DASS). This scale is standardized and adapted from **Gomez (2013).** Validity and usability was ensured by translating it into Arabic and back into English. It involves 21 self-reported item survey to assess the severity of psychological disorders over the last week including depression, anxiety, and stress. Each item is scored from 0 (no response) to 3 (worst response). Each of the three DASS-21 scales includes 7 items, categorized into subscales.

Scoring system

The scale to which each item belongs is indicated by the letter D (Depression) (items 3, 5, 10, 13, 16, 17, 21), A (anxiety) (items 2, 4, 7, 9, 15, 19, 20) and S (stress) (Items 1, 6, 8, 11, 12, 14, 18). Total the points for the things that have been recognized for each scale (D, A, and S). The

total points for each scale (D, A, and S) have been identified. Total scores for each subscale are calculated by summing the scores of the related items. Total mean scores were calculated based on the total score for each item. The total score of each category of psychological alteration ranged from 0 to 21 grades. The total score of all psychological alterations ranged from 0 to 63.

Third part include assessment of social needs using the social dysfunction rating scale. This standardized scale was adapted from **Linn et al. (1969)**. It is a 20- item scale which measures an individual`s social adjustment and social dysfunction. Translation and retranslation into Arabic language was done to ascertain its validity. Three major categories were portrayed in this scale: self- perception, interpersonal relations, and social performance. It consists of 20 items classified under three major categories: self-confidence (4 items), interpersonal relations system (5 items), and social performance system (11 items). The participants were asked to respond against the 6-point Likert scale ranged from not present (0) to severe (5).

Scoring system

Each item is ranged from 0-5, where 0: very severe, 1: severe, 2: moderate, 3: mild, 4: very mild and 5: no alteration. The final score (100) was summed up and was defined as the following: $0 <40$ was considered severe social dysfunction, $40<60$ was considered moderate, $60<80$ was categorized as mild and $80<100$ indicated no social dysfunction.

II-Operational design:

It involved preparatory phase, pilot study, tools validity and reliability, and field work.

A-The preparatory Phase:

The modification and development of data collection tools involved evaluating the most current literature and theoretical understanding of numerous study-related topics through the use of books, journals, the internet, periodicals, and magazines.

Ethical considerations

Ethical approval was obtained from the Ethical and Research Committee, Faculty of Nursing. Modern University for Technology and Information (MTI) with formal approval code number (FAN/ 8 /2020) on 1/8/2020. The objective of the research was illustrated to the participants before they were recruited. Also, anonymity and confidentiality were guaranteed and the right to withdraw from the study at any time. The confidentiality of their data and its exclusive use for research purposes was guaranteed to all participants.

Pilot study:

It included eight patients (equivalent to 10% of the research population) prior to the main trial. The pilot research was carried out to assess the tools' feasibility and applicability, as well as the time required to respond to it. The necessary changes were made to the data gathering tools. As a result, the patients who participated in the pilot trial were not enrolled as study subjects.

Validity and Reliability.

Validity:

A panel of seven experts from the nursing faculty staff of medical surgical and psychiatric nursing departments evaluated the study instruments' content validity. They came from various academic backgrounds - three assistant professors and four professors. The study instruments' thoroughness, accuracy, clarity, relevance, and appropriateness were the topics of their opinions. The final version was established after modifications were made in accordance with the advice of specialists.

Reliability:

Reliability assessment of the tools was established statistically by using Cronbach's alpha test which displayed good internal consistency and reliability as follows: patient interview questionnaire =0.880, physical needs assessment regarding symptom and functional alteration =0.797, physical needs assessment as regard to performance of daily living activities using Barthel index scale =0. 803, assessment of the psychological needs of patients using DASS = 769) and social dysfunction rating scale =0. 803.

Field Work:

Field work was started and completed within 6 months from the beginning of October 2020 until end of March 2021. Data was collected at least 3-5 days /week from 9 am to 1 pm. Four phases were adopted in this work: assessment, planning, implementation, and evaluation.

Assessment phase

The sample size was estimated to be 40 patients for each group as sample size equation. They were selected from those MS patients who were studied according to inclusion criteria. A sample of eighty patients with multiple sclerosis were distributed equally into two equal groups: study group involved 40 patients who received the nursing educational guidelines in addition to the routine out-patient care (patient assessment, treatment dosage adjustment, referral). The control group included 40 patients who received only the routine hospital out-patient care.

This phase was focused on collecting data from study participants to explore the patients' social, physical, psychological, and educational needs using study tools I, II prior to planning and implementation of educational guidelines. To avoid contaminating the sample, the researcher began data collection from the control group then study group in this period. In this stage, following each patient's visit to the outpatient clinic, the researchers conducted one-on-one interviews to gather baseline information on demographics, medical history, and knowledge using tools I and II for the study group as well as the control group. For every patient, the study instruments required between thirty and forty-five minutes to be completed. The researchers met 3-4 patients per day. The researchers got the telephone number for each participant and individualized what app group was established between each participant and researchers to facilitate communication.

Planning phase

To determine the needs of the patients, all the information gathered on their knowledge and biopsychosocial requirements was examined. After examining relevant literature, the researcher created an educational guideline in Arabic based on the needs of the patients and reviewing literature (**Eltamimi et al., 2016; National institute of neurological disorders and stroke, 2020; National Multiple Sclerosis Society, 2020; Pantavou, 2020**). Based on the assessment phase, the educational material had been created by the researcher in the form of a power point presentation, in addition to a booklet. Both included basic information concerning multiple sclerosis (definition, etiologies, manifestations, relapse, exacerbations, diagnostic findings, and

management including, diet and fluids; activity and exercises; medication; smoking cessation. The educational material had been tested for content validity after translation by a jury of seven experts in the field of medical surgical and psychiatric nursing, after which the necessary modifications were done accordingly.

The educational guidelines included four essential domains including knowledge and self-care practices regarding disease and its management, management of physical changes associated with MS, psychological and emotional management of psychological changes associated with MS and social management of social changes associated with MS. The researchers prepared an illustrated guideline booklet in simple Arabic language to help patients comprehend the information provided. knowledge about disease and its management covered overview about nerve transmission process and myelination, the meaning of MS, etiologies, its signs and symptoms, relapse, exacerbations, complications, diagnostic evaluation, drug management, diet management, lifestyle modification, activity management and follow up care. Management of physical alterations associated with multiple sclerosis include the management of common physical alterations including pain, fatigue, motor, sensory, visual, gastrointestinal, cognitive, speech and swallowing, bowel, and bladder disturbances in addition to sleep disorders. psychological and emotional management of psychological alteration associated with multiple sclerosis include instructions regarding management of common emotional and psychological disturbances as anxiety and depression. In addition, management of social alterations associated with multiple sclerosis includes instruction regarding management of common social alterations associated with MS.

Implementation phase

The researchers in the outpatient clinic conducted one-on-one interviews with each patient. During this stage, the researcher applied the created guidelines alone for the study group. The control group didn't receive educational guidelines, only the routine care provided for patients in out-patient clinic, meanwhile the study group receive educational guidelines in addition to routine care. The researchers got the telephone

number of each patient from both groups and individual WhatsApp chat was held to facilitate communication answering questions and delivering any additional educational materials. The educational guidelines were planned and implemented for study group patients only according to each patient' needs. Individualized education sessions were held for every patient. The educational guidelines were handed out to every patient in the study group only, and the content was explained over three to five sessions based on the patient's condition, with 30-45 minutes for each session. The purpose of the first session was to provide orientation to the intervention. Simple language was used by the researchers to suit the comprehension level of patients, reinforcement, and motivation to enhance learning. A copy of the Arabic booklet was provided to every patient for their future reference.

After providing a summary of the session's material, the researcher invited questions from the patients, responded to them, and cleared up any misunderstandings. In the event of a mistake, patients might voice their questions while listening and showing attention. The first session began with an introduction to the educational guidelines related to multiple sclerosis, and each subsequent session began with a recap of feedback from the preceding one. The researcher stressed the value of follow-up visits at the conclusion of these sessions and told the participants that she would assess them a month following the last session.

Educational guidelines were implemented through many strategists according to patients' needs including educational session, self-care management (nutritional, drug, activity, follow up, dealing with exacerbation), use of complementary therapy for pain and fatigue, counseling, group therapy, referral, reinforcement of prescribed exercise program. They were followed out of their outpatient clinic date through WhatsApp group and phone calls in addition to zoom meetings.

The educational guidelines were supplemented with posters, power points slide (using tablet 10.1-inch monitor) and Arabic booklet. The researcher followed the participants through individualized WhatsApp groups and phone calls. After evaluating relevant research and assessing the real needs of the adult patients under study, a simplified booklet was employed as a supportive tool and provided to adult patients in Arabic. It covered all topics connected to knowledge and need management.

Evaluation phase

After one month, the researchers evaluated study and control groups for their biopsychosocial and educational needs using study data collection tools. The evaluation for study group using the same data collection tools was done after a month of the educational guideline's implementation, to assess the efficacy of the guideline on patients' physical, psychological, social, and educational needs.

Comparison was done between study and control groups at the end of the study at pre and post implementation phases to evaluate the effect of implementation of patients' educational guidelines on physical, psychological, social, and educational needs of patients under study.

III-Administration design.

The Director of Ain Shams University Hospital was consulted in order to acquire authorization for conducting this study, and the Faculty of Nursing at Ain Shams University provided approval to carry it out.

IV-Statistical design.

The analysis of the data used the mean, standard deviation, whereas unpaired student t-test was used for comparison of quantitative variables between two categories and chi-square test was used for comparison of qualitative variables by (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). A significant level value was deemed when the p-value $\leq$ 0.05 and a highly significance was considered at p-value $\leq$ 0.001, while p-value > 0.05 refers to nonsignificant results.

Results:

Table (1) shows that 57.5% of control group patients as compared to 62.5% of study group patients were within the age group 20 to less than 30 years with the mean age of 33.2±3.45 years for control group and 32.9±4.12 for study group. In relation to gender, 70 % of the control subjects

compared to 75 % of the study subjects were females. Also, 62.5 % of the controls and 55% of the study group were single. Concerning level of education, 30% of the control group and 27.5% of the study group had higher education. Also, 62.5% of the control group and 72.5% of the study group were from urban areas.

Regarding occupation, 40% of the controls compared to 47.5% of the study cases were not working / retired/ student/ housewife. Moreover, 57.5 % of control participants and 37.5 % of study group reported that their monthly income was insufficient to cover health expenses. The results displayed that there was no significant variance between study subjects and controls regarding all demographics (p > 0.05).

Table (2) illustrated frequency and percentage distribution of both groups according to their health history and clinical data, it was found that relapsing–remitting MS was prevalent among 75 % of control group and 70% of the study patients. In relation to duration of disease, the findings showed that 30 % and 47.5% of study and control patients respectively had a disease duration from 18- 24 months with mean duration 13.42 ±2.8 months for control group and 12.57±2.5 months for study group.

It was shown that 67.5% of study group as compared to 62.5 % of control group reported that they had 1-2 times of attacks in the last year. Regarding the history of chronic illness, it was found that 25% and 15% of study and control group respectively had history of chronic illness. Also, 87.5 % of study group compared to 95 % of control group had no family history of MS. Concerning mean scores of body mass index (BMI) among patients under study, it was shown that the mean scores of study group were 27.7± 3.45 kg/m² while the mean scores of BMI of the control group were 25.5 ± 4.7 kg/m². It is obvious from the above table that there were no significant variations between the two groups regarding attacks of exacerbations, history of chronic illness and family history of MS. However, a significant difference was found regarding body mass index mean scores at p = 0.019.

Table (3) shows that there were no statistically considerable variations between study and control group subjects at pre- implementation phase

regarding patients' satisfactory level of knowledge about definition, causes, types, clinical manifestations, diagnostic measures and follow up ,complications and exacerbation of MS and disease management at p> 0.05 , meanwhile, highly significant statistical variations were found between the groups at post –implementation phase regarding definition, causes, types, clinical manifestations, and disease management at p<0.001. Moreover, statistically significant variances were found between study and controls at post–implementation phase regarding diagnostic measures and follow up in addition to complications and exacerbation (p=0.007 &0.003 respectively).

The findings revealed no significant variations between study and control group participants regarding satisfactory level of patient's knowledge at pre- implementation phase at p 0.606, while there were highly statistically considerable differences were found between both groups at post –implementation phase at p <0.001 regarding the same issue.

Moreover, the table reveals that there was no significant difference between pre- and post-implementation phases regarding total satisfactory level of knowledge among control group patients at p = 0.160, while there was significant difference between pre- and post-implementation phases regarding the same variance among study patients at p<0.001.

Figure (1) showed the difference between the groups under study regarding total satisfactory level of self-care practices as patients' report, this study results indicated a highly significant difference between the study and control subjects post implementation of educational guidelines at p<0.001. However, there was no significant difference between the groups before implementation of educational guidelines at p=00.649.

Table (4) describes total mean scores and mean percentage scores of common physical changes at pre and post guideline implementation among patients under study. It was found that there were no significant differences between the subjects of both groups at pre-implementation phase regarding motor symptoms, sensory alteration, visual disturbances, speech and swallowing issues, bladder/bowel alterations,

cognitive, gastrointestinal and sleep disturbances, fatigue, and pain at p > 0.05.

The findings revealed also that there was highly significant reduction of mean scores and mean percentage scores of study group as compared to control patients regarding motor symptoms, visual disturbances, speech and swallowing problems, gastrointestinal and sleep disturbances, fatigue, and pain after implementation of educational guidelines, while there was significant reduction regarding sensory alteration. However, no significant variation was found between the groups under study regarding bladder/bowel alterations and cognitive disturbances at post implementation phase according to statistical test (p >0.05) .

Concerning overall physical alterations among study and control groups, the finding revealed that there was no significant difference between both groups at pre-implementation phase at p=0.573. However, there was highly significant reduction of overall physical symptom alteration among study group in comparison to control group patients after the implementation (p <0.001).

It was noticed from figure (2) which describe the variation between the study and control patients regarding total disability level according to Barthel Index Scale that 42.5 %. and 35% of the study group as compared to 37.5% and 45%. of the control group had slight and moderate dependency respectively at pre-implementation phase with statistically insignificant difference at p =0.648. Meanwhile, 67.5 % and 25 % of the study group as compared to 27.5 %, 55 % of control group respectively had slight and moderate dependency with significant improvement of the level of dependency among study patients as compared to control group post implementation (p =0.005).

Regarding psychological alteration among study and control group, table (5) declared that there were considerable reductions among study subjects in comparison to controls regarding total mean scores of depressive, anxiety and stress symptoms at post guidelines implementation phase (p= 0.009, 0.024 & 0.027 respectively) while there was no statistically considerable variation between both group participants at pre-implementation according to statistical testing at

p >0.05. Moreover, there was marked reduction in overall mean scores of psychological alterations among study participants compared to controls post- implementation (p = 0.012) while no marked difference was detected between the groups under study before implementation (p =0.291).

Table (6) illustrates social dysfunction level among the two groups at pre- and post-guidelines implementation. There was found that 32.5 %, 20 % of study group and 40%, 15% of control group respectively had moderate and severe total social dysfunction at pre-implementation phase with insignificant statistical difference (p=0.453), meanwhile, 22.5% and 12.5% of study group as compared to 47.5, 17.5 % of control group had moderate and severe total social dysfunction at post-implementation phase with significant variance statistically found at p=0.021. In addition, the findings revealed statistically significant reduction regarding total mean scores of social alterations among study as compared to control group at post implementation phase at p=0.039.

Table (1): Distribution of demographic data among the study and control group subjects (No=80):

Demographic data	Study group (n=40)		Control group (n=40)		t/X2	P-Value
	No.	%	No.	%		
Age (years):						
▪ 20-<30	25	62.5	23	57.5	0.697	0.712
▪ 30- < 40	7	17.5	10	25		
▪ ≥40	8	20	7	17.5		
▪ **Mean± SD (years)**	32.9±4.12		33.2±3.45		0.353	0.725
▪ **Min. – Max.**	19-45		18-47			
Gender:						
▪ Male	10	25	12	30	0.251	0.617
▪ Female	30	75	28	70		
Marital status						
▪ Single /divorced/ widow	22	55	25	62.5	0.464	0.496
▪ Married	18	45	15	37.5		
Level of education:						
▪ Read and write	6	15	12	30	3.511	0.476
▪ Basic education	13	32.5	8	20		
▪ secondary education	10	25	8	20		
▪ High education	11	27.5	12	30		
Residence:						
▪ Rural	11	27.5	15	37.5	0912	0.340
▪ Urban	29	72.5	25	62.5		
Occupation:						
▪ No working / retired/ student/ housewife	19	47.5	16	40	3.119	0.210
▪ Sedentary work	17	42.5	14	35		
▪ Muscular work	4	10	10	25		
Adequacy of monthly income to health cost as their report						
▪ Not enough=inadequate	15	37.5	23	57.5	3.214	0.201
▪ Enough to some extent	15	37.5	10	25		
▪ Enough=adequate	10	25	7	17.5		

Non-Significant (NS) = P. > 0.05

Table (2): Frequency and percentage of the groups based on their health history and clinical data (No=80)

Clinical data	Study group (n=40)		Control group (n=40)		t/X2	P-Value
	No.	%	No.	%		
Disease pattern						
▪ Relapsing–remitting MS	28	70	30	75	0.355	0.837
▪ Secondary progressive MS	8	20	6	15		
▪ Primary progressive MS	4	10	4	10		
Duration of disease (months):						
▪ < 6 months	8	20	4	10	3.855	0.277
▪ 6 - <12 months	11	27.5	7	17.5		
▪ 12 - <18 months	9	22.5	10	25		
▪ 18- 24 months	12	30	19	47.5		
▪ **Mean ±SD.** Min-Max	12.57±2.51 (3-22)		13.42 ±2.8 (4-24)		1.430	0.157
Number of attacks of exacerbations in last year						
▪ None	8	20	12	30	1.410	0.703
▪ 1-2 times	27	67.5	25	62.5		
▪ 3- 4 times	2	5	1	2.5		
▪ 5 times	3	7.5	2	5		
Mean ±SD Min-Max	1.9±0.76 (0-5)		1.7±0.84 (0-5)		1.117	0.268
History of chronic illness:						
▪ yes	10	25	6	15	1.250	0.264
▪ no	30	75	34	85		
Family history of MS:						
▪ Yes	5	12.5	2	5	1.409	0.235
▪ No	35	87.5	38	95		
Body mass index (BMI) (total mean scores):						
Mean ±SD (kg/m²)	27.7± 3.45		25.5 ± 4.7		2.386	0.019*

Non-Significant (NS) = P. > 0.05

Table (3): Difference between both groups group regarding satisfactory level of patient's knowledge at pre and post guidelines implementation

Items	Study group (n=40)		Control group (n=40)		X² test	p- value
	No.	%	No.	%		
Pre- implementation phase						
▪ Definition and meaning of MS	10	25	12	30	0.251	0.617
▪ Causes and risk factors	12	30	13	32.5	0.058	0.809
▪ Types of MS	6	15	5	12.5	0.105	0.745
▪ Clinical manifestation	13	32.5	16	40	0.487	0.485
▪ Diagnostic measures and follow up	9	22.5	11	27.5	0.267	0.606
▪ Complications and exacerbation	5	12.5	11	27.5	2.813	0.094
▪ Disease Management	8	20	10	25	0.287	0.592
▪ **Total**	9	22.5	11	27.5	0.267	0.606
Post –implementation phase						
▪ Definition and meaning of MS	32	80	15	37.5	14.907	<0.001**
▪ Causes and risk factors	34	85	20	50	11.168	<0.001**
▪ Types of MS	29	72.5	11	27.5	16.200	<0.001**
▪ Clinical manifestation	35	87.5	19	47.5	14.587	<0.001**
▪ Diagnostic measures and follow up	27	67.5	15	37.5	7.218	0.007*
▪ Complications and exacerbation	30	75	17	42.5	8.717	0.003*
▪ Disease Management	36	90	21	52.5	13.730	<0.001**
Total	32	80	17	42.5	11.850	<0.001**
Difference between total satisfy. knowledge level at pre- and post-implementation phases	X2 test	P-value	X2 test	P-value		
	26.467	<0.001**	1.978	0.160		

* Significant (S)   p≤ 0.05   ** Highly Significant (HS) p ≤ 0.001   Not significant (NS) p> 0.05

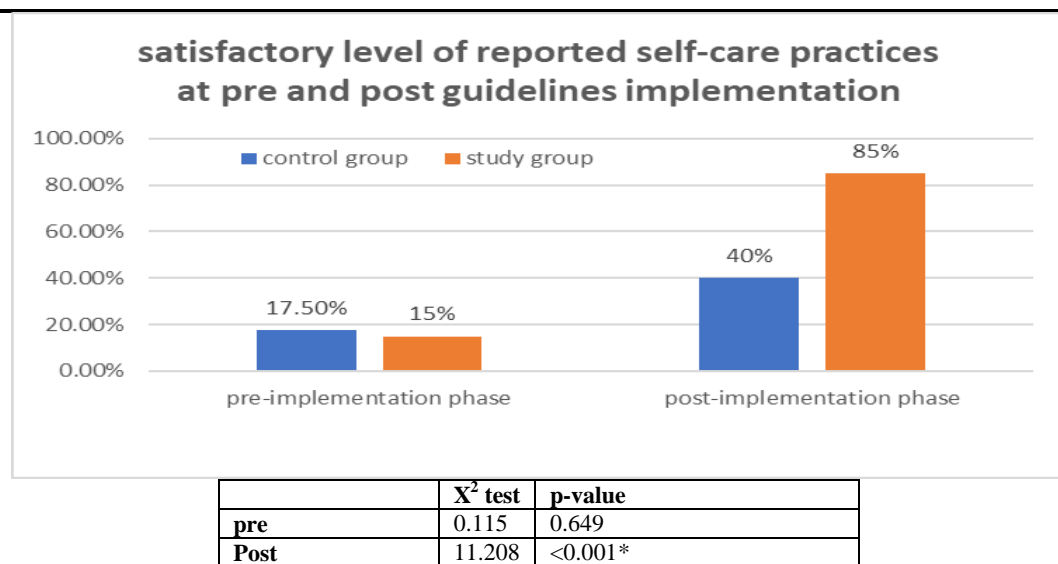|	X^2 test	p-value
pre	0.115	0.649
Post	11.208	<0.001*

Figure (1): Difference between the groups regarding total level of satisfactory of reported self-care practices at pre and post guidelines implementation phases (Total n=80).

Table (4): Difference between the groups regarding total mean scores of common physical alterations at pre and post guideline implementation (Total n=80).

Items	Study group (n=40) Mean	SD	% score	Control group (n=40) Mean	SD	% score	t-test	p- value
Pre- implementation phase								
Motor symptoms (0-8)	5.23	1.2	61.21%	5.01	1.54	60.89%	0.713	0.478
Sensory alteration (0-6)	4.57	2.15	51.3%	3.98	1.26	45.9%	1.497	0.138
Visual disturbances (0-6)	3.7	1.06	40.06%	4.06	1.37	40.34%	1.314	0.193
Speech and swallowing problems (0-9)	3.92	1.27	42.2%	4.02	1.56	45.3%	0.314	0.754
Bladder/bowel alterations (0-8)	2.8	1.12	32.1%	2.6	1.09	30.5%	0.809	0.421
Cognitive disturbances (0-6)	2.9	1.16	31.04%	3.12	1.13	34.3%	0.859	0.393
Gastrointestinal disturbances (0-7)	3.6	1.3	42.9%	3.7	1.24	41.6%	0.352	0.726
Sleep disturbances (0-5)	3.9	1.26	40.01%	4.4	1.30	50.1%	1.747	0.085
Fatigue (0-10)	9.5	1.47	99.7%	9.8	1.41	99.8%	0.931	0.355
Pain assessment (0-10)	8.2	1.69	91.7%	7.9	1.8	87.9%	0.768	0.445
Post –implementation phase								
Motor symptoms (0-8)	3.5	1.24	41.5%	5.9	1.54	62.1%	7.677	<0.001**
Sensory alteration (0-6)	3.34	1.23	43.7%	4.1	1.36	47.9%	2.621	0.011*
Visual disturbances (0-6)	3.76	1.1	41.01%	4.9	1.41	48.2%	4.032	<0.001**
Speech and swallowing problems (0-9)	2.35	1.22	36.7%	3.4	1.2	42.2%	3.881	<0.001**
Bladder/bowel alterations (0-8)	2.8	1.4	33.6%	2.7	1.1	31.9%	0.355	0.723
Cognitive disturbances (0-6)	2.4	1.06	29.1%	2.3	1.12	28.9%	0.410	0.683
Gastrointestinal disturbances (0-7)	1.9	1.13	24.3%	2.9	1.3	38.6%	3.672	<0.001**
Sleep disturbances (0-5)	2.1	1.11	32.5%	4.5	1.47	52.3%	8.240	<0.001**
Fatigue (0-10)	6.6	1.35	71.2%	9.7	1.83	98.1%	8.622	<0.001**
Pain assessment (0-10)	6.5	1.4	69.8%	8.2	1.6	89.1%	5.057	<0.001**
Overall alteration (pre) (0-75)	**44.5**	**5.34**	**53.2%**	**45.2**	**5.71**	**53.6%**	**0.566**	**0.573**
Overall alteration (post) (0-75)	**39.7**	**4.87**	**42.3%**	**44.8**	**6.2**	**53.9%**	**4.091**	**<0.001****

* Significant (S) p< 0.05   ** Highly Significant (HS) p < 0.001   Not significant (NS) p> 0.05
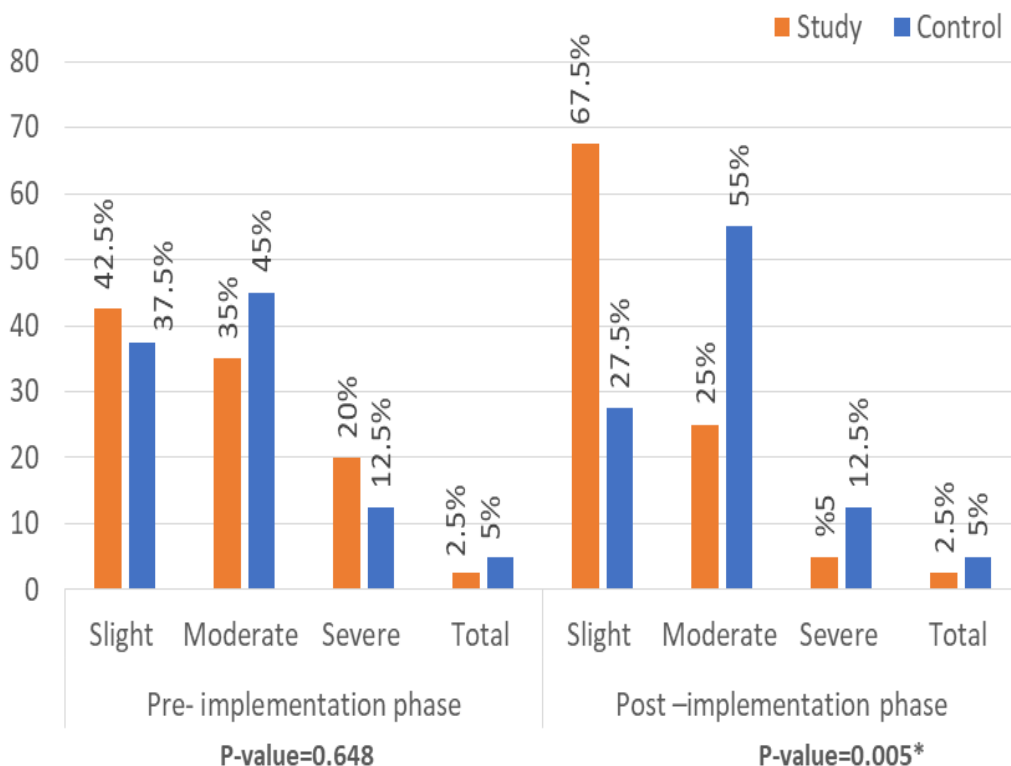
* Significant (S) p< 0.05   Not significant (NS) p> 0.05

Figure (2): Difference between the study and control group subjects regarding total disability level according to Barthel Index Scale at pre and post guidelines implementation (Total n=80).

Table (5): **Difference between the study and control patients regarding psychological alterations according to DAS scale at pre and post guideline implementation (Total n=80).**

Items	Study group (n=40)		Control group (n=40)		t-test	p- value
	Mean	SD	Mean	SD		
Pre- implementation phase						
▪ Depressive symptoms (0-21)	12.9	3.26	13.2	3.41	0.402	0.689
▪ Anxiety symptoms (0-21)	15.5	2.45	14.8	2.6	1.239	0.219
▪ Stress symptoms (0-21)	16.8	2.73	17.1	3.7	0.413	0.681
Total mean scores (0-63)	**45.4**	**6.24**	**46.8**	**5.52**	**1.063**	**0.291**
Post –implementation phase						
▪ Depressive symptoms (0-21)	11.8	2.6	13.4	2.74	2.679	0.009*
▪ Anxiety symptoms (0-21)	12.23	2.45	13.7	3.2	2.307	0.024*
▪ Stress symptoms (0-21)	13.1	2.7	14.7	3.6	2.249	0.027*
Total mean scores (0-63)	**39.8**	**5.34**	**43.6**	**7.68**	**2.569**	**0.012***

* Significant (S) p< 0.05   Not significant (NS) p> 0.05

Table (6): **Difference between the study and control group regarding social alteration according to social dysfunction scale at pre and post guideline implementation (Total n=80).**

Items	Study group (n=40)		Control group (n=40)		t/X2	p- value
	No.	%	No.	%		
Pre- implementation phase						
▪ No social dysfunction	2	5	0	0	2.625	0.453
▪ Mild	17	42.5	18	45		
▪ Moderate social dysfunction	13	32.5	16	40		
▪ Severe social dysfunction	8	20	6	15		
▪ Total mean scores (0-100)	52.3 ±6.32		54.7±7.15		1.591	0.116
Post –implementation phase						
▪ No	4	10	0	0	9.683	0.021*
▪ Mild	22	55	14	35		
▪ Moderate social dysfunction	9	22.5	19	47.5		
▪ Severe social dysfunction	5	12.5	7	17.5		
▪ Total mean scores (0-100)	61.2±8.11		57.87±5.92		2.098	0.039*

* Significant (S) p< 0.05   Not significant (NS) p> 0.05

Discussion

MS patients often confront great challenges regarding their life prospects, their physical limitation, emotional and psychological disturbances, employment perspectives, and their social distraction. Hence, identifying and addressing biopsychosocial needs of patients with MS is a crucial part of the nursing role as a key prerequisite to developing appropriate education aiming at improving (patients' lives, optimizing their ability to be productive and managing the costs associated with treatment (**Mehr & Zimmerman, 2015).**

The objective of the current study was to assess the effect of patients' educational guidelines on meeting biopsychosocial and educational needs of patients with multiple sclerosis. This study hypothesized that educational guidelines will significantly improve social, psychological, physical, and educational requirements among study patients in comparison to the control after their implementation.

The findings of the research revealed that around three fifths of study and control patients aged 20 to less than 30 years with the mean age of 33.2±3.45 years for control group and 32.9±4.12 for study group and three fourths of them were female. This is coincided with typical onset of MS is in the mid-30s and young age. These findings were in harmony with **Omrani et al.**

(2018) who stated in their study titled "Early onset multiple sclerosis: Reports of 300 patients from Iran" that the peak age of MS patients was between 20 and 30 years and more than three quarters of patients were females. As regards marital status, it was found that slightly more than half of the study and control group were single. That may be because three fifths of the study and control groups were young-aged patients and due to the effect of their disease on their marital status.

Concerning level of education, the results showed that about half of study and control groups had secondary and high education. This farther has a good impact on their ability to understand and receive educational guidelines more efficiently. Also, more than three fifths of the study and control groups were from urban areas. This may be because the MS out-patient clinic which is the setting for data collection serves as a specialized MS unit that provides out-patient care for patients with multiple sclerosis from near and far districts in Cairo governorate. This is in accordance with results of **Ibrahim et al., (2016)** in their study titled "psychosocial Nursing Intervention for Improving Quality of Life of Patient with Multiple Sclerosis " and conducted in the same setting who stated that more than two thirds of the study sample lived in urban areas.

Regarding occupation, it was found that two fifths of the control group subjects compared to nearly half of the study group subjects were not working / retired/ student/ housewife. It may be due to the effect of MS on their physical ability to carry out household and/or occupational affords. Moreover, more than half of control group and up to two fifths of study group patients reported that their monthly income was insufficient to cover health expenses. In this regard, **Zakaria et al., (2016)** whose title " Clinical characteristics of patients with multiple sclerosis enrolled in a new registry in Egypt " reported in their study that more than half of studied sample were unemployed and had monthly income enough to some extent.

As regards distribution of the study and control group subjects according to their health history and clinical data, it was found that relapsing–remitting MS was prevalent among around three quarters of the study group patients. In relation to duration of disease, the findings showed that mean duration of MS was ranged from 12-13 months among study and control groups. Regarding the number of attacks of exacerbations in last year among patients under study, it was shown that more than three fifths of study and control groups reported that they had 1-2 times of attacks in the last year. Concerning mean scores of body mass index (BMI) among study and control group patients, it was shown that the mean scores ranged from 25 to 27 kg/m², this indicates overweight according to body mass index. Overweight and high body mass index are known risk factors for developing multiple sclerosis (MS) as explained by **Manouchehrinia et al. (2018).**

In this regard, **Ziemssen and Thomas (2017)** in a study about the long-term treatment of relapsing-remitting MS stated that the majority of patients have a relapsing-remitting MS. Also, **Alhazzani et al. (2018)** presented a study "Insomnia among non-depressed multiple sclerosis patients " revealed that five years were the mean duration of disease diagnosis. This discrepancy may be because the selected criteria for current study include a maximum of 2-years duration after diagnosis of MS.

The findings displayed also that there were no considerable differences between the participants of the two groups regarding demographic data, adequacy of monthly income to health costs, duration of disease, the number of attacks of exacerbations in last year and body mass index. This finding indicates that both groups are compatible and had homogenous needs, and this provides good evidence for the impact of educational guidelines on meeting their needs.

Comparison of pre and post-implementation educational needs among study and control groups under study, the current work shows that there were no statistically significant variation between the two categories at pre-implementation phase regarding patients' satisfactory level of knowledge about definition, causes, types, clinical manifestations, diagnostic measures and follow up , complications and exacerbation of MS and disease management in addition to the total satisfactory level of knowledge about MS meanwhile, there were highly significant increase in total satisfactory level of knowledge among study group participants in comparison to the control at post – implementation phase.

The improvement of patients' knowledge as a result of implementation of educational guidelines may be attributed to many causes including validation and effectiveness of educational guidelines in relation to its objectives, content, implementation, media and booklet, and the permissive atmosphere of educational conduction as patients were able to ask questions giving them the opportunity to participate.

In this regard, **Ibrahim et al., (2016)** in previously mentioned study about MS reported that there were highly marked differences were found between pre- and post- implementation as regard "nature, causes, manifestation, diagnosis, treatment, and total knowledge about disease. Also, **Afrasiabifar et al., (2016)** in a study entitled "The Effect of Orem's Self-Care Model on Fatigue in Patients with Multiple Sclerosis: A Single Blind Randomized Clinical Trial Study " demonstrated that there was significant difference in the total knowledge scores pre- and post the intervention and added that the significant

variation was noted in the direction of increasing knowledge.

In relation to total satisfactory level of self-care practices as patients` report, this study results indicated that there was highly remarkable improvement of total satisfactory level of self-care practices among study group participants as compared to control category following the implementation. As well as this could ensure the success of the educational guidelines on assessment of self-care deficits among study group subjects and improving their awareness and knowledge regarding them which subsequently result in the improvement of MS patients' reported self-care practices. In the same line, **Habibnia et al. (2018)** reported in their study titled "the Effect of Self-Care Education on the Performance of Multiple Sclerosis Patients: A Randomised Control Trial" and reported that there was a remarkable difference between the intervention group and the control group regarding performance of self-care behaviors due to effective patients' education.

The abovementioned findings verified the research hypothesis H1 and H2 which stated that "Educational Guidelines will statistically significantly improve knowledge and self-care practices among study group patients as compared to control group after their implementation".

Patients with multiple sclerosis may experience a range of symptoms, such as vertigo, ataxia, spasticity, weakness in the extremities, and visual impairment. Among MS patients' prevalent symptoms are cognitive impairments, walking issues, chronic pain, fatigue, sleep disturbances, and bowel and bladder abnormalities. **(Braley et al, 2016)**

In relation to physical alterations at pre and post guidelines implementation among patients in the current study, the results illustrated that there was highly significant reduction of mean scores and mean percentage scores among study group as compared to control group patients regarding motor symptoms, visual disturbances, speech and swallowing problems, gastrointestinal and sleep disturbances, fatigue, and pain after the implementation, while there was significant reduction regarding sensory alteration. However,

no significant difference was found between both groups regarding bladder/bowel alterations and cognitive disturbances at post-implementation phase. In addition, the finding revealed a highly statistically significant reduction of overall physical symptom alteration among study group as compared to control group patients after the implementation.

This could affirm the positive impact of implementing patients' educational guidelines on assessing and dealing with individualized physical alterations among study group that improve educational needs, manage self -care deficits, improve patients' abilities to deal with various physical alterations and exacerbations, increase adherence to therapeutic diet, drug management and activity management that consequently improve most of physical alterations among study group after its implementation.

The previous findings were in accordance with **HamidReza et al., (2013)** whose study titled "The Effect of Intervention based on Health Belief Model on improving the Quality of life in Patients with Multiple Sclerosis" and found that the mean scores regarding physical functioning, mental health, physical role, and bodily pain after intervention had a significant variance compared to before the intervention. Also, **Ibrahim et al., (2016)** in their study reported that there were highly significant differences found between mean scores pre- and post- implementation regarding physical and mental health composites of patients with MS due to effect of psychosocial intervention.

One of the noticeable findings in the current work is that no significant difference was found between both groups regarding bladder/bowel alterations and cognitive disturbances at post-implementation phase. This may Because these alterations are correlated with each other, in which cognitive function is thought to play a key role in controlling function of bowel/bladder as explained by **Schumpf et al. (2017)** who study urinary incontinence and its association with functional physical and cognitive health. In addition, these types of alterations need a more individualized and guided approach to be addressed and managed. This finding to somewhat support the findings of

Sahebalzamani et al. (2012) with title "The effects of self-care training on quality of life in patients with multiple sclerosis" and reported that training was found to improve overall physical health except cognitive activities. On the other hand, **Dahmardeh et al. (2017)** contradict this finding and found that urinary and bowel alterations were improved after implementation of educational problems.

It is noteworthy that total disability level according to Barthel Index Scale among the study and control group subjects in the present study revealed that there was statistically significant improvement of the level and total mean scores of dependency of daily living activities among study group patients as compared to control group after implementation of educational guidelines, meanwhile, no statistically difference was detected between both groups at pre-implementation phase. This improvement may be due to successive implementation of educational guidelines in addressing and managing physical alterations among study group which result in significant reduction of pain, fatigue level and motor alteration which consequently reduce disability level.

In the same line, **Feysa et al. (2013)** in their study titled "Effects of an 1-day education program on physical functioning, activity and quality of life" found that Physical activity increased at 3 months compared to baseline, maintained at six months in intervention group using Physical Activity Scale for Individuals with Physical Disabilities (PASIPD).Also this finding was supported by results of **Dahmardeh and Amirifard (2018)** who illustrated that there was highly statistical significant difference after intervention when comparing the mean score of dependency of daily living activities dimension of self-efficacy.

The previous findings as regards physical alterations and level of dependency verified the research hypothesis **H3** which stated that educational guidelines will statistically significantly improve physical needs among study group patients as compared to control group after their implementation".

Psychological disorders are common in multiple sclerosis (MS) patients. Patients suffering from multiple sclerosis (MS) frequently experience uncertainty in their lives and major life changes due to the unpredictable nature of their disease. Depressive illnesses, anxiety, helplessness, and excessive levels of stress might result from this. Notwithstanding these circumstances, anxiety disorders are frequently obscured by depression, leading many medical practitioners to ignore and undertreat their presence **(Hanna & Strober, 2020).**

The current study findings emphasized provision of educational guidelines could significantly reduce total mean scores of depressive, anxiety, and stress symptoms among study group as compared to control group after implementation of educational guidelines. Also, in relation to overall psychological alteration according to DAS scale among study and control groups, the findings illustrated that there were statistically significant reductions among study group patients as compared to control group regarding total mean scores of depressive, anxiety, and stress symptoms at post guidelines implementation phase while, there was no statistically significant difference between both groups at pre guidelines implementation. These findings support H4 and indicate positive effect of educational guidelines and effective educational strategies which help the patients in the study group to select more appropriate strategies in response to stressful and anxious situations and consequently improve depressive, anxiety and stress symptoms.

This is consistent with results of study conducted by **Sahebalzamani et al. (2012)** who indicated in their study that there was statistically significant change in overall psychological health after training. Also, **Maslakpak and Raiesi (2014)** in study titled "Effect of a Self-Management and Follow-Up Program on Self-Efficacy in Patients with Multiple Sclerosis: A Randomized Clinical Trial" was to somewhat in accordance with current abovementioned result and reported that self-management programs have beneficial effects on patients' health perceptions and anxiety levels among intervention group.

Regarding the effect of educational guidelines on the level and total mean scores of social dysfunctions among the study and control groups at post-guidelines implementation phase using

social dysfunction rating scale, it was noticed that there was a statistically significant reduction regarding total mean scores of overall social dysfunctions among study group as compared to control group due to effect of educational guidelines implementation. This supports the fifth study hypothesis and suggests the effectiveness of educational guidelines in improving the overall social well-being of the study group. From researchers' point of view, improving physical and psychological alterations may correlate positively with social well-being among study group patients.

In this respect**, Faraji et al. (2018)** in their study entitled " Effect of Self-Care Education on Social Adaptability in Patients with Multiple Sclerosis" declared that the social adaptability score in the intervention category revealed a marked elevation at weeks 1 and 4 post the intervention. However, **Maslakpak and Raiesi (2014)** contradict the abovementioned finding and found that the intervention did not significantly affect the dimension of social self-esteem. They explained their finding that the majority of their studied patients with MS were young, and the aftermaths of the disease significantly affect their dependence on others. The discrepancy between both studies might be because the current and other study subjects were from different cultures and communities and the degree of available social support may affect social well-being.

Conclusion

Based on our findings, it can be concluded that the educational guidelines based on assessment of biopsychosocial and educational needs for patients with multiple sclerosis was effective in improving knowledge and self-care practices among study group as compared to control group after its implementation. Furthermore, the study group as compared to control group patients had highly statistically significant reduction of mean scores and mean percentage scores of motor symptoms, visual disturbances, speech and swallowing problems, gastrointestinal and sleep disturbances, fatigue, and pain after implementation of educational guidelines. Regarding independence of activities of daily living, statistically significant improvement of the level of dependency among study group patients as compared to control group

after implementation of educational guidelines. Moreover, there was statistically significant reduction in total mean scores of psychological alterations among study group as compared to control group after implementation of educational guidelines. In addition, the findings revealed statistically significant reduction regarding total mean scores of social alterations among study group as compared to control group due to positive effect of educational guidelines implementation. The abovementioned findings indicate the effectiveness of educational guidelines on meeting biopsychosocial and educational needs of patients with multiple sclerosis and supported all study hypotheses.

Recommendations

Based on the findings of the present study, the following recommendations can be deduced:

- Dissemination of study guidelines and booklet in an Arabic language to be available for all patients with MS with all needed information regarding MS in out-patient clinics and all settings receiving patients with MS.

- Further research studies are needed to focus on studying factors affecting bio psychosocial needs of patients with MS.

- Organizing an in-service training program for staff nurses and other health care provider regarding multidimensional care for patients with multiple sclerosis based on their needs.

- It is advised to repeat the study using a large probability sample in order to acquire greater generality.

- Adopting a bio-psycho-social approach in assessment and management of patients with multiple sclerosis including highly integrated interventions in physical, psychological, and social domains, which will be administered to maximize the benefits that the components have on each other.

- Further studies are to be conducted about effective methods and strategies to meet the different needs for patients with MS.

- Further research should be conducted to assess the effect of biopsychosocial intervention on quality of life for patients with multiple sclerosis over long periods of time.

- Replication of the study for literacy patients, this will be crucial for meeting the health care needs for such groups of patients with multiple sclerosis.

- Education regarding critical skills for managing symptoms and developing an effective coping strategy, including self-care practices and disease-modifying drugs, should be provided to patients diagnosed with multiple sclerosis.

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