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ORIGINAL ARTICLE

The Effect of Humor Intervention Program on Positive and Negative Symptoms among Schizophrenic Patients

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ABSTRACT

Background: Schizophrenia is a chronic disease characterized by distortions in thinking, perception, emotions, language, sense of self and behavior. Humor could be used as an alternative to conventional treatment with the goal of helping patients with schizophrenia cope with symptoms, enhance recovery through its emotional, cognitive, social and physiological effects. The aim of the study was to evaluate the effect of humor intervention program on positive and negative symptoms among schizophrenic patients.
Design: Randomized control trial (RCT) design was used.
Sample: Purposive sample consisted of 40) schizophrenic patients, the study group (n= 20) and control group (n= 20). The patients were selected and allocated randomly into two groups, intervention group (received the humor interventions program) and control group (received traditional care). The study conducted in the Psychiatry and Addiction Prevention "El Kasr AlAini University Hospital and al Rakhawy Hospital for Mental Health.
Tools: three tools were used for data collection were; the Socio Demographic Data Sheet, Positive and Negative Syndrome Scale (PANSS) and Multidimensional Sense of Humor Scale (MSHS).
Results: revealed that, there was a statistical significant difference between total score of PANSS between study and control groups post intervention.
Conclusion: The present study emphasizes the importance of humor intervention program in reducing severity of symptoms of patients with schizophrenia.
Key words: schizophrenia, humor intervention, positive symptoms, negative symptoms

BACKGROUND

Schizophrenia is a mental disorder that influences how a person behaves, thinks, and perceives the reality. This is identified by symptoms such as delusions, hallucinations, disorganized speech, and reduced emotional expression that debilitates the person's level of functioning and quality of life (Ganguly, Soliman & Mustafa, 2018). Schizophrenia is a serious and impaired psychiatric condition that usually occurs during the transition from puberty to adulthood, with loss of cognitive, behavioral and social functions. Schizophrenia is not only a mental health complaint, since it can be also associated with adverse somatic health impacts, and the life expectancy of people with schizophrenia is around 20 years lower than that of the general population (Coyle, 2017).

According to the DSM-5, at least two of the following symptoms occurring especially over a span of one month, delusion, hallucination, disorganized speech, severely disorganized or catatonic behavior and negative symptoms characterizes schizophrenia (Townsend, 2018).The diagnostic criteria focused that delusions, hallucinations or disorganized speech must be at least one of the symptoms. Nevertheless, the most significant psychiatric symptoms are actually persecutory delusion and hallucinations .Schizophrenia manifests either as positive symptoms, negative symptoms or in the form of cognitive symptoms. Positive symptoms are known as psychotic behaviors and usually demonstrate as loss of contact with reality (Owen, Sawa, & Mortensen, 2016).

Positive symptoms typically appear in the beginning of the disorder, displaying impaired cerebral functions, including hallucinations, delusions, disorganized speech and irregular psychomotor behavior, such as catatonia. As with the negative symptoms can be identified through disruptions to normal emotions and behaviors. They are characterized by the reduction of complete loss of normal behavioral functions, causing impairments such as a logy (lack of coherence of speech and organization of ideas), affective flattening (limited range of emotional expression, poor eye contact, and reduced body language), a volition (low goal-directed actions), anhedonia and social retraction (Silva, Kanazawa & Vecchia, 2019).

Mental disorders show high prevalence rates in today's society and are a significant burden for those suffering and the health care system. Research into their treatment is important and most treatments, such as pharmacological or psychotherapeutic therapy, have already demonstrated their efficacy. New trends in recovery from mental illness the introduction of different types of treatment, particularly those that emphasize positive aspects such as personal resources, well-being, and positive emotions, will bring a sustained improvement in mental health. A new and promising way to promote positive emotions is humor (Sliter, Kale, Yuan ,2014).

Humor is an essential human characteristic and can be evoked by verbal (jokes) or visual materials (cartoons or movies), as well as in social situations. Humor is a complicated phenomenon, which includes cognitive,

emotional, behavioral, psychophysiological and social aspects. On the cognitive axis, humor is related with a perception of incongruity or paradox in a playful context; emotionally, it is related with a pleasant emotional state which has been defined as “pleasure” in phrases of psychophysiology, it has been asserted that it is related with decreases in cortisol, growth hormones, and epinephrine and as a social phenomenon, humor performing an essential role in interpersonal communication and attraction (Fritz, Russek & Dillon, 2017).

Humor interventions are simple, easy to deliver, interventions that could be an important add-on therapy for people with schizophrenia; particularly for the targeting of negative symptoms and cognitive disability. Humor interventions are desirable and relatively small in the cost (Cai, 2014). Furthermore, humor can reduce negative symptoms of anxiety and depression in patients with schizophrenia. Humor one of the psychological interventions can control symptoms and complications of mental disorders. Humor can be used as a new procedure to deal with various mental disorders and rehabilitate them (Atadokht, Ebrahimzadeh, Mikaeeli, 2019).

SIGNIFICANCE OF THE STUDY

In Egypt, schizophrenia is the most well known psychiatric disorder, and speaks to the significant majority of inpatients in Egyptian mental hospitals (WHO, 2014). Several studies have been published empirically assessed the effects of humor intervention in psychiatric settings and found positive changes in the patients. For instance, a 3-month humor intervention program was applied in psychiatric ward schizophrenic patients, and found that the use of humorous approach led to an improvement of their symptoms (Falnkenberg, Buchkremer, Bartels, Wild, 2011).

A few scattered research papers examine the effect of humor interventions on schizophrenic patients especially in Egypt so, there need to study the effect of humor interventions as an effective treatment modality for schizophrenia. Humor interventions could be introduced to improve the symptoms of schizophrenia and increase the quality of life of those who suffer from it. The study is considered as a basis for mental health professionals' consideration in treatment of patients with schizophrenia and would emphasis the role mental health nurses in this aspect.

AIM OF THE STUDY

This study evaluate the effect of humor intervention program on positive and negative symptoms among schizophrenic patients

Research hypotheses: H 1: The positive symptoms scores of schizophrenic patients who receive the humor intervention program will be lower than those who receive their treatment as usual at post- intervention than pre-intervention.

H 2: The negative symptoms scores of schizophrenic patients who receive the humor intervention program will be lower than those who receive their treatment as usual at post- intervention than pre- intervention

Sample: A purposive sample of (40) schizophrenic patients, the study group (n= 20) and control group (n= 20).

Inclusion criteria: both sexes, aged between 20-50 years, can read and write, experience positive and negative symptoms according to DSM-5, duration of illness not less than 3years from the in-patients departments.

Exclusion criteria: patients with mental retardation, neurological disorders, substance induced psychosis, and substance abuse will be excluded from the study.

Setting: The study was conducted at two settings; one belongs to the governmental mental health university services: the In-patient departments of Psychiatry and Addiction Prevention Hospital at Kasr Al-Aini University Hospital, and the other belongs to private sector of mental health application: Rakhawy Hospital for Mental Health.1) The Psychiatry and Addiction Prevention Hospital at Kasr Al-Aini University Hospital it presents inpatient and outpatient services, and consists of five floors.2) The Rakhawy Hospital for Mental Health and Addiction Treatment in Egypt is known as the first milieu therapy hospital in the Arab world. The hospital provides psychiatric services including inpatient and outpatient services, treatment programs, group and individual therapy for adolescent, adults and elderly, in addition to day care center, addiction treatment and therapeutic workshops.

Tools of Data Collection: A-Sociodemographic data sheet. This sheet was developed by the researcher and includes personal data such as age, sex, educational level, marital status, occupation, duration of illness, place of residence and previous admissions.

B - Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, Opler ,1987) The PANSS is a standardized scale that measures the prevalence of positive and negative symptoms and general psychopathology in schizophrenia. PANSS consists of 30- distinct items, 7-point rating (1 = absent; 7 = extreme), arranged in three independent subscales with scoring ranging from 30-210 points. Higher scores represent higher seriousness in each subscale. The negative symptoms subscale measures the blunting of affect, emotional withdrawal, poor rapport, passive/apathetic social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation, and stereotyped thinking. The positive symptoms subscale assesses delusions, conceptual disorganization, hallucinatory behavior, excitement, grandiosity, suspiciousness, and hostility. The general psychopathology subscale assesses somatic concern, anxiety, feelings of guilt, tension, mannerisms and posturing, depression, motor retardation, uncooperativeness, unusual thought content, disorientation, poor attention, lack of judgment and insight, disturbance of volition, poor impulse control, preoccupation, and active social avoidance.

30 items are included in the PANSS; 7 constitute a positive scale, 7 constitute a negative scale, and the remaining 16 are a general psychopathology scale. The scores for the three scales are calculated by summation of ratings across component items. Therefore, the potential ranges are 7 to 49 for the positive and negative scales, and 16 to 112 for the general psychopathology scale. In addition, a composite scale is scored by subtracting the negative score from the positive score. The internal consistency (reliability) of the measure is adequate (Cronbach's α = .94).

C- Multidimensional Sense of Humor Scale (MSHS; Thorson &Powell, 1993) The MSHS is self-report scale measure the multidimensional aspects of sense of humor, composed of 24 items. It has four dimensions of personal sense of humor (1) humor creation (overt use of humor in social situations), (2) use of humor as a coping mechanism (trying to see the funny side of things), (3) humor appreciation (liking humor), and (4) attitude toward humor and humorous persons (approving of humor). The scale is scored based on 5-points Likert scale, ranging from 4 (strongly agree) to 0 (strongly disagree). Eighteen items were phrased positively and six items were phrased negatively. Negative scores were coded reversely and total scores range from 0 to 96. The lowest possible total score is zero and the highest is 96. The higher scores indicate a better sense of humor. The scale has been translated into Arabic language and validated) Qasim, Shahin, Abdel Fattah, 2013).The internal consistency (reliability) of the measure is adequate) Cronbach alpha coefficient α =.90).

Ethical Considerations: A written ethical approval was used, after approved by the "Ethics of Scientific Research Committee" at the Faculty of Nursing - Cairo University. In addition, an official permission to conduct the proposed study was obtained from the head of "Mental Health and Addiction Prevention Hospital at Kasr Al-Aini University Hospital and The Rakhawy Hospital. The patients filled the informed consent after completing description of the purpose and nature of the study. All subjects were informed that participation in the current study is voluntary. The assigning of a code number to each participant who replied to the questionnaire ensured anonymity and confidentiality, as well as the fact that participation was without risk and that participants could withdraw from the study at any time without explanation and without risk or punishment.

Procedure: An official approval was obtained from the Ethical Committee of Scientific Research at the Faculty of Nursing, Cairo University. Also, an official approval was granted from the director of Psychiatry and Addiction Prevention Kasr Al-Aini University Hospital and Rakhawy Hospital. Afterwards the researchers interviewed all participants who fit inclusion criteria before they enter the program. During the recruitment of the sample the researcher found unavailability of the sample because most of the patients suffering from substance-induced disorders it considers one of the exclusion criteria and take more time to find participants who fit inclusion criteria. The purpose of the study was explained oral and written consent was obtained before fulfilling the tools. The researchers used semi structured interview to complete tools for patient assessment ; Socio Demographic Data Sheet, PANSS and Multidimensional Sense of Humor Scale as pre-test, this interviewed lasted for about 30-45 minutes, also researchers' observations for patients communications and interactions with other patients, also severity of symptoms.

Description of the program:

Humor Intervention Program (HIP)

Aim: This program aims to reduce positive and negative symptoms and improve sense of humor in patient with schizophrenia.

Overview: It is a program that uses humor to engage patients in social activities and to enhance their social interaction over time. Humor can divert the patients' attention from unreality as hallucination and delusion to reality activities. It may provide an effective way to deal or cope with problems (Tagalidou, Distlberger, Loderer & Laireiter, 2019). Through humor intervention, the process of perception and judgment of the current condition of the patients can improve.

The implementation of humor intervention program in a mental health service may improve rehabilitative outcomes. Moreover, it can have positive impact on emotional, cognitive, social and physiological states. Humor can be used as a new procedure to deal with various mental disorders. It can be integrated in a diversity of rehabilitation programs (Ruch, Hofmann, 2017). The tools used in HIP include lab top, smile ball, paper, pens, videos, cards and foam. They were specifically selected to serve each sessions' objectives. Each session started with checking in and ended with closing and reflection. The group intervention was applied by the researcher and a psychologist with a more than 5 years' experience in group therapy with schizophrenia patients to provide a skilled and experienced leadership for the group work.

Objectives of HIP

1- Assessing of the patients' attitude toward the use of creative arts.
2- Highlighting the existence of humor in the participants' lives.
3- Emphasizing the role of humor in enhancing the interpersonal interactions.
4- Recognizing the role of humor in stressful situations.
5- Understanding the value of seriousness, being as important as humor.

The application of HIP began with an individual session providing information for the Socio Demographic Data Sheet. PANSS and MSHS were collected as the pre -test study instruments for both the study and the control groups. The researcher spent time with the patients to prepare them to be involved in the study, establish rapport with them, and introduce each one to other patients; the researcher facilitated the feeling of warmth and maintained the feeling of security to encourage the patients' sharing and openness. HIP consists of twelve 90-minute-session, which were held over a one month period (3 sessions per week). The topic of every session is relatively based on the previous one. The program sessions started with finding humor in our lives and ended with humor in the movies, series and comedy programs. At the beginning of each session, the theme of the session was shared with patients.

The following are the specific themes of the twelve sessions:

Session (1): Introduction and overview of the program and revising humor in our lives (past, present or future).
Session (2): Humor in special events: Wedding
Sessions (3): Seriousness versus playfulness.
Session (4): Humors in old Egyptian heritage
Sessions (5): Humor in songs and poems.
Sessions (6): Humor as a coping mechanism in stressful situation.
Sessions (7): Non-verbal humor.
Sessions (8): Humor as a facilitator of interpersonal communication.
Sessions (9): Laughter.

Sessions (10): Humor in everyday life (present daily activities/routine).
Sessions (11): Humor in the movies, series and comedy programs.
Sessions (12): Closing

STATISTICAL DESIGN

A Statistical Package for Social Science (SPSS) version 20 was used for statistical analysis of data. The used tests are: Chi square for testing homogeneity between two groups (study and control group), Paired t- test used to test difference with study group and student independent t – test was used to study the difference between two groups. (p-value) less than 0.05 was considered significant and less than 0.001 considered as highly significant.

RESULTS

Part (1): Sociodemographic characteristics of the study and the control group

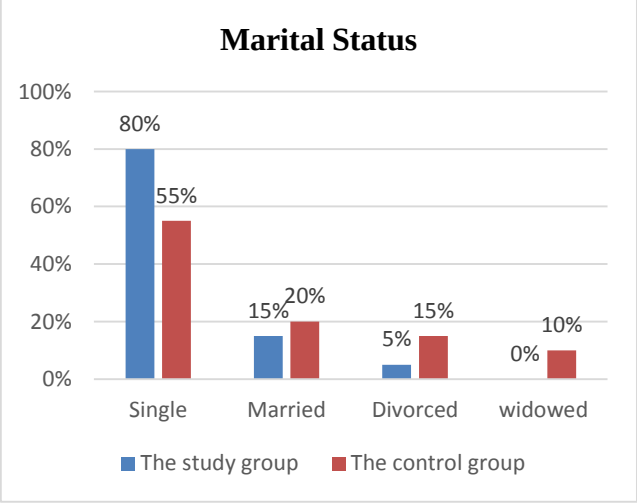
Table (1) Frequency distribution of demographic characteristics of the study and control group (n=20).

Demographic data	Study group		Control group		χ^2	P value
Age	No	%	No	%	1.345	0.511
20 + years	6	30	3	15.0		
30 + years	8	40	9	45.0		
40 + years	6	30	8	40.0		
Mean±SD	33.600 ±7.98288					
Gender					2.057	0.342
Male	19	95	16	80.0		
Female	1	5	4	20.0		

Table (1) shows that 40%, 45 % of the study and the control groups aged between 30 years to 39 years. 95% of the study group and 80% of the control group were males.

Figure 1.Frequency distribution of marital status of the study and the control group (n=20).

Figure (1) demonstrates that 80% of the study group and 55% of the control group were single



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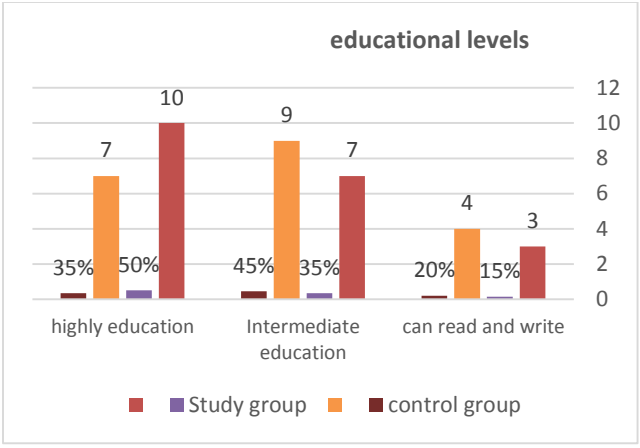

Figure 2. Frequency distribution of educational levels of the study and the control group (n=20).

Figure (2) illustrates that half of the sample of the study group were highly educated and 45% of the control group were intermediately educated. While 15% & 20% of the study and the control groups could read and write

Part 2: Comparison between pre and post HIP among study group regarding the scores of PANSS positive scale

Table (2)

Items	Study group				T-test	P-value
	n = (17)		n = (17)			
	Pre program		Post program			
	Mean	SD	Mean	SD		
1-Delusions	1.8824	.85749	1.4706	.87447	2.764	0.014
2-Conceptual disorganization	1.5294	.71743	1.3529	.60634	-1.852	.083
3.Hallucinatory behavior	1.5294	1.00733	1.1765	52859	2.400	.029
4. Excitement	1.2353	.75245	1.0000	.00000	-1.289	.216
5. Grandiosity	2.7059	1.26317	1.5294	.62426	5.101	.000
6.Suspiciousness / persecution	1.8824	.92752	1.3529	.70189	-2.496	.024
7. Hostility	1.2941	.68599	1.0000	.00000	1.768	.096

*P < 0.05 is significant

Table (2) shows that comparing PANSS positive scores of the study group revealed that there were statistically significant differences between the pre and post intervention. This includes delusions, hallucinatory behavior, grandiosity and suspiciousness (t= 2.764 at p=, 0.014, t=2.400 at p= 0.029, t=5.101 at p= 0.000 & t = -2.496 at p= 0.024) respectively.

Table 3: Comparison of PANSS negative scores between the pre and post HIP of the study group

Items	Study group				T-test	P-value
	n = (20)		n = (17)			
	Pre program		Post program			
	Mean	SD	Mean	SD		
8. Blunted affect	2.5294	1.17886	1.1176	.33211	-5.470	.000
9. Emotional withdrawal	2.6471	1.16946	1.1765	.39295	6.428	.000
10. Poor rapport	2.3529	1.05719	1.1765	.39295	-4.288	.001
11. Passive/apathetic social withdrawal	2.5882	1.06412	1.1176	.33211	6.019	.000
12. Difficulty in abstract thinking	2.0588	1.02899	1.1176	.33211	4.315	.001
13. Lack of spontaneity &	1.0000	.61237	1.0588	.24254	.436	.668
14. Stereotyped thinking	1.1765	.52859	1.0000	.00000	-1.376	.188

*. P < 0.05 is significant

Table (3) shows that as for PANSS negative scores, statistically significant differences were also found when the pre and post interventions were compared. This includes blunted affect, emotional withdrawal, poor rapport, social withdrawal and difficulty in abstract thinking (t= -5.470 at p= .000, t= 6.428 at p = .000, t=-4.288 at p = .001, t=6.019 at p= .000 & t= 4.315 at p= .001) respectively.

Table (4): Comparison between the total scores of PANSS and the total scores of MSHS of the study and the control groups at pre and post intervention.

Variable	Mean ±SD		t-test	p-value
	Study	Control		
PANSS	35.64±4.608	48.17±6.830	-6.269	.000
MSHS	75.23±9.377	53.58±14.11	5.268	.000

Significant at p-value < 0.01

Table (4) shows the total PANSS and MSHS scores of the study and the control groups before and after intervention. The results of PANSS revealed a statistically significant difference where t = - 6.269 at p= 0.000. Regarding the MSHS, a statistically significant difference was found, where t= 5.268 at p= .000.

DISCUSSION

The current study results found that statistically significant differences between PANSS positive scores in the study and the control groups at post HIP. These results support the first research hypothesis.

H 1: The positive symptoms scores of schizophrenic patients who receive the humor intervention program will be lower than those who receive their treatment as usual.

This result may be because the humor program provides motivation and entertainment (such as watching funny videos, listening to music, drawing, painting, role-playing, and singing) to divert the patient from the hallucinations and delusions experienced to minimize the patient's interaction with their own world; release thoughts, feelings, or emotions that have been affecting the behavior.

Furthermore, in a Chinese study, Qiu H-Z et al. (2017). Concluded that the humor program can reduce the distress caused by psychotic symptoms and reinforce reality by encouraging the patient to participate in here and now reality-oriented group activities. This may also have contributed to the reduction of the time spent with their involvement in their psychotic symptoms. Moreover, humor is a coping mechanism that enhances the patient's coping ability with their symptoms as well as their relationship with themselves and the environment. HIP also provides a stimulating environment where patients are encouraged to participate in different cognitive, visual and auditory activities such as painting, drawing and playing games. This would have grasped their attention and encourages their socialization skills. HIP provides an opportunity for a social learning environment by engaging the patients in various leisure group activities. It also provides an opportunity to ventilated and share anxiety, anger, and violent attitudes that may occur as a result of their underlying psychopathology that includes delusions, hallucinations and other psychotic symptoms

The findings are congruent with a Turkish study conducted by Gökcen, Ekici, Abaoğlu & Şen's (2020), which revealed significant improvement in positive symptoms and general psychopathology after the implementation of humor therapy. Tagalidou, Distlberger, Loderer & Laireiter (2019) supported the current study results and reported that humor therapy plays an important role in reducing positive symptoms. Ahsan's (2017) also showed that the program of humor therapy has significantly contributed to the reduction of psychotic symptoms such as hallucinations and delusions.

The use of humor was reported to promote psychological well-being, increases friendliness and helpfulness, and builds group identity and cohesiveness (Bag, 2020). HIP has been tailored to offer each patient an opportunity to develop a sense of belonging and cohesiveness. Cohesiveness is one of Yalom's therapeutic factors in group psychotherapy (Yalom & Leszcz,2005). Specifically, patients have more social contact with other group members in sharing their intimate issues as well as in decision-making group processes.

Instillation of hope was also one of the factors that may have contributed to the postivie findings of the current study. It is another therapeutic factor of group therapy that was emphasized by Irvin Yalom & Leszcz (2005). One of the objectives of the HIP is to promote optimism, hope and appositive emotions and increase self-esteem. HIP encourages patients to perceive, appreciate humorous activities and to establish relationships, relieve tension and release anger.

"After I joined the group and sang with my colleagues, I felt that anxiety and tension decreased to me, and I was happy when they encouraged me and said your voice is nice. This was a comment of one of the patients in the group. Another patients said "I was annoyed, bored, and unable to talk to anybody or do anything before I joined you in the group, but after I role played with my colleagues, watching humorous videos and won the competition nonverbal sense of humor, And the one was happy himself and around it. I felt that my mood had improved, and I now enjoy talking to my colleagues and want to return to work." The researcher noted that better conversations between respondents during the session of HIP.

H 2: The negative symptoms scores of schizophrenic patients who receive the humor intervention program will be lower than those who receive their treatment as usual

These results support the second research hypothesis. They revealed statistically significant differences between PANAS negative scores in the study and the control groups at post HIP. This result indicates that the reduced negative symptoms of patients with schizophrenia can be related to the impact of the HIP. Patients with negative symptoms suffer from inexpressiveness, lack of enjoyment, loss of emotional and social apathy, and almost no stimulus can trigger their emotional responses. Thus, humor in these patients would trigger a sense of enjoyment and pleasure, it would increase their motivational ability and put them in a playful and pleasurable mood. Humor serves as an acceptable therapeutic method to tolerate many unpleasant things. Patients gain the capacity to cope with stress and anxiety caused by the diseases, which ultimately leads to the improvement of their condition.

The HIP used videos that emphasize the role of humor in our life such as coping with stress and improving

interpersonal relationships. The group co-leaders (the researcher and the psychologist/ therapist) encouraged the patients to participate in pleasurable group activities such as role-playing, dancing, playing games, singing, painting, and drawing. The increased social interaction, abstract thinking, elevated mood, self-esteem, hope, and energy was emphasized in the post-group discussions. They were noticed in participating members specially those who suffered from negative symptoms (social isolation, anhedonia, avolition and flat affect) who became more actively involved in the group activities.

Cai, Yu, Rong, Zhong (2014) discussed the verbal feedback of participants in the humor group. The authors reported that the patients with schizophrenia who participated in the humor group felt less anxious and depressive than previously and reported a better sense of humor, and were especially more capable of using humor as a coping mechanism. The patients appreciated the humorous approach and were willing to pursue the training until the end. Yim (2016) also reported that humor produces a positive emotional state and can be defined as a state of pleasurable engagement with the environment eliciting feelings, such as happiness, joy, enthusiasm, and hope. Positive emotion is part of the concept of subjective well-being that includes life satisfaction, pleasure, hope and optimism. Atadokht, Ebrahimzadeh, Mikaeeli (2019) conducted a study using comedy videos and found that patients with schizophrenia who watched a comedy video, as compared to those who viewed a non-humorous video, reported a greater increase in feelings of hopefulness.

CONCLUSION

The current study results concluded that humor intervention is an essential therapeutic technique that enhances perception, attention, abstraction and creation. It provides motivation and entertainment to distract the patient from the hallucinations and delusions. In addition, humor intervention enhances social interactions and produces positive emotions. Humor is an effective intervention in reducing hopelessness, depression, isolation and loneliness and others negative symptoms such as anhedonia, avolation, alogia, social withdrawal and apathy. Humor intervention decreased positive and negative symptoms in patients with schizophrenia. Therefore, applying humor is recommended to managing the schizophrenic patients' problems.

Recommendations: Based on the study findings, the following recommendations were formulated:

1. The nurses in health care settings should be trained to use humor as a therapeutic intervention which will provide higher quality care for schizophrenic patients and improve their symptoms.
2. Humor intervention should be integrated in conjunction with pharmacological treatment and other therapeutic interventions for psychiatric patients.
3. Giving more interest in the humor intervention should be enhanced and supported in rehabilitation phase for schizophrenic patients which will increase their coping skills in outside community.
4. Humor as a therapeutic intervention should be integrated in the nursing students' curriculum which will enhance a concept of holistic care.
5. Further studies are needed using a larger probability sample for generalization of the results.

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