

Effect of Virtual Social Network-Based Psychoeducation Intervention on Level of Hope and Caregiving Burden among Family Caregivers of Patients with Schizophrenia

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Abstract

Background: Family caregivers of patients with schizophrenia often experience high levels of burden and stress due to the demanding nature of their role. Virtual social network-based psychoeducation can help promote hope and reduce the burden among family caregivers of patients with schizophrenia. **Objective:** Determine the effect of virtual social network-based psychoeducation intervention on the level of hope and caregiving burden among family caregivers of patients with schizophrenia. **Settings:** The study was carried out at the outpatient clinic of El-Maamoura Hospital for Psychiatric Medicine which is affiliated to the Ministry of Health and Population, Egypt. **Subjects:** A convenient sample of 41 caregivers were included in the previously mentioned setting. **Tools:** Four tools were used to collect data in this study. Tool one: "Patients with schizophrenia and Family Caregivers Socio-Demographic and Clinical Data Structured Interview Schedule". Tool two: "The Adult Hope Scale (AHS)". Tool three: "Caregiver Burden Inventory (CBI)". Tool four: "Knowledge and Skills of Caregiving Scale (KSCS)". **Results:** The study showed that there was a significant difference regarding the caregivers' hope domains (agency, pathways) at pre, post, and one month after intervention $P (<0.001^*)$. Furthermore, the study groups exhibited significant differences between caregiver's burden subscales at pre, post, and one month after intervention $P (<0.001^*)$. Also, there was a significant difference between caregiver's levels of knowledge and skills at pre, post, and one month after intervention $P (<0.001^*)$. **Conclusion:** Applying a virtual social network-based psychoeducation intervention had significant effect on increasing the level of hope and alleviating the caregiving burden among family caregivers of patients with schizophrenia. **Recommendations:** Virtual social network-based psychoeducation intervention is recommended in clinical practice guidelines for caregivers of patients with schizophrenia.

Keywords: Caregiving burden, Hope, Psychoeducation, Virtual social network.

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Introduction

Schizophrenia is a chronic psychiatric disorder accompanied by disruptions in perception, cognition, language, emotions, behaviors, and life-related functioning (Peng et al., 2022). Due to a global deinstitutionalization of the treatment of mental disorders, caring for people with a mental health condition shifted from psychiatric hospitals to community health

and only a low proportion of those suffering from mental disorders are admitted to hospitals. (Bassuk, & Gerson, 2022). Therefore, this deinstitutionalization movement resulted in many patients with an enduring course of psychosis being discharged into communities that are not well prepared to care for them. In this way, family caregivers are forced to assume full

responsibility for their patient's care, which creates challenges and burdens for them (Chien & Norman, 2003; Bhatia & Jena, 2011).

A Caregiver burden refers to the strain endured by a person who cares for a chronically ill individual (Clari et al., 2022). Okafor, and Monahan, (2023) reported that 83–95% of family caregivers of schizophrenia patients experience a significant burden, which can lead to frustration and negatively affect caregivers' coping skills, hope, and quality of life.

Hope is a positive emotional state with an overall perception of achieving one's goals. One's thinking about goal-directed activities plays an important role in the attainment of positive outcomes. Hope as goal-directed thinking consists of two interrelated components: agency (the individual's perceived capacity to reach goals), and pathway (the individual's perceived ability to generate routes) (Seyedfatemi, Asl, Bahrami, & Haghani, 2021). Caregivers who are more hopeful tend to have a lower burden than individuals with a low level of hope. Therefore, the level of hope is a crucial factor in determining caregiver burden (McGee et al., 2024).

In this respect, it was argued that family members who are caregivers for patients with schizophrenia are not aware of the needs and illnesses of their patients, the disease process and outcome, signs of relapse, the prescribed medications, and so on. In other words, they need psychoeducation (Alyafei, Alqunaibet, Mansour, Ali, & Billings, 2021).

Psychoeducation is defined as the provision of education and information designed to help patients and their families understand and/or cope with illness more effectively (Pan, Li, Jin, & Lu, 2024). It has been associated with reduced levels of caregiver burden and relapse in patients with schizophrenia and is a recommended treatment strategy worldwide (Hode et al., 2024).

Virtual social networks (VSN) psychoeducation is a new platform of communication for the community of mental health. It is a web-based online environment that supports social networks among individuals. (Mutiarra, Pamungkasari, Padmawati, & Probandari, 2024). Today, (VSN) psychoeducation has several advantages over face-to-face interventions. Access to virtual-based psychoeducation is easier because participants can join from home, lowering costs, time, and effort. Also, anonymous participation may reduce stigma (Seyedfatemi et al., 2021).

Aims of the Study

This study aimed to determine the effect of virtual social network-based psychoeducation intervention on the level of hope and caregiving burden among family caregivers of patients with schizophrenia.

Research hypotheses:

1. Family caregivers of patients with schizophrenia who participate in virtual social network-based psychoeducation intervention exhibit a higher level of hope compared to their scores before attending the same intervention.
2. Family caregivers of patients with schizophrenia who participate in virtual social network-based psychoeducation intervention exhibit a lower level of caregiving burden compared to their scores before attending the same intervention.

Materials and Method

Materials

Design: A one-group quasi-experimental design (pretest-posttest) was used in this study.

Settings: The study was conducted at the outpatient clinic of El-Maamoura Hospital for Psychiatric Medicine which is affiliated to the Ministry of Health and Population.

Subjects: A convenient sample of 41 family caregivers of clients with schizophrenia who meet the following inclusion criteria.

Inclusion criteria:

- Living in the same house for at least one year with a patient diagnosed with schizophrenia without any comorbidity.
- Primary caregiver, who is involved in providing physical, financial, and/or emotional care for his/ her patient.
- Have no psychiatric disorders.
- Aging from 18 to 65 years.
- Can read and write.
- Has a smartphone with access to the internet and the Telegram messaging application and can manage the application.

Tools: To collect the necessary data for the study four tools were used:

Tool I: Patients with schizophrenia and Family Caregivers Socio-Demographic and Clinical Data Structured Interview Schedule:

This was developed by the researcher after reviewing related literature.

Part 1: Patient's family caregiver's socio-demographic characteristics such as age, gender, marital status, educational level, occupation, economic status, kinship to the patient, duration of caregiving roles.... etc.

Part 2: Patient's socio-demographic and clinical data such as age, gender, age at onset of illness, duration of disease, number of admissions to psychiatric hospitals, compliance to medications, family history of mental illness etc.

Tool II: The Adult Hope Scale (AHS):

This scale was developed by **Snyder et al. (1991)**, to assess the level of hope among people over 15 years of age. The scale consists of 12 items and is using an 8-point Likert type scale. Higher scores reflect a higher amount of goal-directed energy or greater ability for planning to achieve goals respectively.

Tool III: Caregiver Burden Inventory (CBI):

The CBI is a 24-item self-report instrument developed by **Novak and Guest (1989)** to explore the caregiver burden. It has five different dimensions which are time-dependent burden (5 items); developmental burden (5 items); physical burden (4 items);

social burden (5 items); and emotional burden (5 items). Each item is rated on a Likert scale with higher scores indicating a higher burden.

Tool IV: Knowledge and Skills of Caregiving Scale (KSCS):

The Knowledge and Skills of Caregiving Scale (KSCS) is a five-item questionnaire developed by **Zhou et al. (2021)** to measure the caregiver's understanding of the following aspects: symptoms of patients with schizophrenia, medication for the treatment of schizophrenia, side-effects of the medications, how to care for the patients, and how to control the patients' symptoms (Zhou et al., 2021). Higher score demonstrating higher knowledge and better skills in caregiving.

Method

Administrative steps:

- Approvals from the Research Ethics Committee and the Committee of Graduate Studies at the Faculty of Nursing, Alexandria University was obtained before conducting the study.
- Written permissions for conducting the study were obtained from the General Secretariat of Mental Health and the director of El-Maamoura Hospital for Psychiatric Medicine.

Training steps:

The researcher successfully completed an online training program on "How to create a Virtual Classroom using Google-Slides" under the supervision of prof/ Rachel Lindsey, Assistant Director, Career Education, George Mason University, Career Services, Fairfax, Virginia, United States.

Tool Validation

- Tool I (A Socio-Demographic and Clinical Data Structured Interview Schedule for caregivers and their patients) was developed by the researcher after reviewing literatures.
- Tool II (Adult Hope Scale), and tool IV (Knowledge and Skills of Caregiving

Scale) were translated into Arabic language by the researcher and back translation was done by bilingual expert professors in the field of Psychiatric Nursing. Tools II, and IV was then tested for content validity by a jury of five experts in the psychiatric nursing field.

Pilot study and internal consistency were done on five family caregivers of patients with schizophrenia to assess the clarity, applicability of the tools as well as the time needed for their application. These subjects were not included in the actual study.

Planning steps:

The psychoeducational intervention package that was developed by **Sharif et al. (2012)** was translated into the Arabic language by the researchers, the content of each session was revised and approved, and necessary modifications were made taking into consideration the Egyptian culture and the needs of caregivers based on the result of tool IV.

Before conducting the actual study, the researcher was applying the virtual psychoeducation intervention on two family caregivers of patients with schizophrenia under supervision of the study supervisors. These caregivers were excluded from the actual study subjects.

Actual study:

The following steps were used to conduct the descriptive part of the study:

The researcher visited the out-patients of El-Maamoura hospital for psychiatric medicine 5 times a week and the clients' medical charts were reviewed to ensure the patients diagnosis. Then their caregivers who meet the inclusion criteria were recruited as the subjects of the study.

To obtain the baseline data (pretest), tools I, II, III, and tool IV were then self-administered on an individual basis, at the outpatients' clinic to ensure that all items

of the tools were completed and that there were no missed items.

The study subjects were asked to choose the most suitable time to log in and attend the sessions from a pre-planned schedule, with different times set by the researcher to suit the participants. The study subjects were then subdivided into 6 subgroups, with about (7-8) caregivers in each subgroup. Each subgroup of caregivers received 12 sessions of online group psychoeducation using a version of Sharif et al. (2012).

Each session of the intervention was conducted and ranged from 60 to 90 minutes. One education session was applied to each subgroup per week for 12 weeks. Exercises were given as homework assignments after each session.

Immediately after termination of all sessions for each subgroup, a posttest was done for each caregiver individually, and then repeated one month after the intervention, using the same pre-testing tools. This was done at the outpatient clinic setting after establishing an appointment during the subject's visit to the outpatient clinic, accompanying their patients for regular follow-up.

The following steps were used to conduct the experimental part of the study:

The psychoeducation interventions consisted of twelve, (60-90) minutes sessions held during twelve weeks (one session each week). Each caregiver attended 12 sessions (in twelve weeks) according to their most suitable time, selected from a pre-planned schedule with different times designed by the researcher. Each session had a set of specific goals and contents.

Each psychoeducation session included a variety of teaching strategies designed to enhance the participant's learning, maintain their attention, and allow them to practice new skills. Techniques were encompassing PowerPoint presentation slides, visual

materials, group discussions, brainstorming, question and answer, roleplaying, and an Arabic electronic handout.

Each session was divided into structured and unstructured segments. The structured segment involves a detailed presentation about the selected topic assisted by a PowerPoint presentation. This is followed by a discussion and clarification of questions posed by the participants. The discussion and clarification are not structured and are based on the requests from the participant. During this segment, the participants were encouraged to discuss any problems that they encountered, any incidences of emotional upset, communication problems or relationship problems, so that the researcher could organize the interventions accordingly.

Each session began with a brief review of the previous session and addressed any questions raised by group members. Then the researcher proceeds by presenting the selected topic and/or skill of the session.

At the end of each session a summary, feedback and further clarification for the vague items was provided. During this time, the participants were encouraged to ask any questions or demand clarifications they needed. Participants were also informed of the goal of the next meeting and encouraged to review the booklet and think about potential questions.

Ethical considerations:

Before and throughout the study, the followings were considered:

1. Informed written consent was obtained from the recruited family caregivers after explaining the aim of the study.
2. Data confidentiality was assured and respected.
3. Subjects' privacy was considered and respected.

4. The right to withdraw from the study at any time was emphasized and allowed.
5. Voluntary participation in research steps was assured by studied subjects.

Statistical analysis:

- Data were fed to the computer and analyzed using IBM SPSS software package version 23.0.
- ANOVA with repeated measures followed by Adjustment Bonferroni for multiple comparisons between the three periods.
- Pearson coefficient was used to correlate between normally distributed quantitative variables.
- Regression to detect the Effect of Knowledge and Skills of Caregiving Scale (KSCS) on The Adult Hope Scale (AHS) and Caregiver Burden Inventory (CBI).
- Significance of the obtained results was judged at the 5% level.

Results

Table 1 shows the distribution of studied caregivers of patients with schizophrenia according to their socio-demographic characteristics. It was noted that 78.0% of caregivers were females. Caregivers' ages ranged between 27 and 64 years, with a mean age of 46.0 ± 11.27 years. Those caregivers whose age was more than 50 years constituted 43.9 % of the total sample. Speaking about the caregivers' kinship to their patients, 39.1% of them were either their mothers or fathers, while 36.5% of them were either brothers or sisters. It was also noticed that 63.4% of the studied caregivers were married and 26.8% were divorced or widowers.

As regards the educational level, 12.2% of caregivers can read and write, while only 7.3% of them have a basic level of education. The table also revealed that 63.4% of studied caregivers were either housewives or not working, and only 24.4% were working. It was observed that 75.6% of

the caregivers considered their income not enough. This table also shows that only 19.5% of caregivers were suffering from physical health problems, with most of them (62.5%) suffering from either hypertension or liver disease. Concerning the presence of additional supporting co-caregivers in providing care, 12.2% of the caregivers reported doing it alone while 36.6% did it with the assistance of their mother or father. This table also reveals that the duration of being a caregiver ranged between 1 to 12 years, with a mean duration of 4.63 ± 2.66 years.

Table 2 shows the comparison between the level of hope pre-post and one month after intervention among the caregivers of patients with schizophrenia. It was found that 87.8% of caregivers were hopeless or had low hope pre-intervention while post-intervention only 12.2% were either hopeless or had a low level of hope and the percentage reached 0.0% one month after intervention. A Statistically significant difference was found between the level of hope at pre-post and one month after intervention $P (<0.001)$.

Table 3 illustrates the comparison between the levels of caregiver's burden of patients with schizophrenia at pre-post and one month after intervention. The table shows that before the intervention most of the studied caregivers had a severe level of burden (92.7%), in contrast, post and one month after the intervention, the percentage of those has a severe level of burden had steadily decreased (70.7% & 68.3% respectively).

In addition, the overall total percentage mean score of caregivers' burden in the post and one month after intervention (46.58 ± 11.71 , 40.44 ± 10.82) respectively was significantly decreased than that at pre-intervention (59.24 ± 13.78). A statistically significant difference was found between the overall burden score at pre-post and one month after intervention $P (<0.001^*)$.

Table 4 shows the correlation between overall scores of hopes, burden, and knowledge & skills perception at pre-post and one month after intervention among the caregivers of patients with schizophrenia. The table illustrates that there is a strong negative correlation between overall burden and hope scores at pre-post and one month after the intervention ($r = -0.422^*$, $p = 0.006$, $r = -0.360^*$, $p = 0.021^*$, $r = -0.282$, $p = 0.074$ respectively). This means that decreased burden scores lead to an increase in overall hope scores at pre-post and one month after the intervention.

Even though there is a negative correlation between the overall knowledge & skills perception and burden score at pre-post intervention but not one month after the intervention. ($r = -0.337^*$, $p = 0.031^*$, $r = -0.312^*$, $p = 0.047^*$, $r = -0.191$, $p = 0.233$ respectively). This suggests that increases in caregivers' overall knowledge and skills scores lead to decreases in overall caregiver burden scores at pre-post but not one month after intervention.

In addition, the table shows that there is a positive correlation between overall knowledge and skills of caregiving and hope pre-intervention ($r = 0.420^*$, $p = 0.006^*$) but there is no such correlation post or one month after the intervention ($r = 0.238$, $p = 0.133$, $r = 0.167$, $p = 0.298$ respectively).

Discussion

Caregiving for individuals with schizophrenia can lead to negative consequences for the caregivers themselves. Studies show that caregivers often experience feelings such as guilt, hopelessness, depression, grief, anxiety, stress, fear, anger, and helplessness during the caregiving process (Kalhovde, & Kitzmüller, (2024); Montejano-Lozoya et al., (2024); Bademli, & Lök, (2020); Bharti, & Bhatnagar, (2020).

On the other hand, hope has a positive impact on both patients and caregivers' populations. Hopefulness positively influences clinical and psychosocial

outcomes (Galderisi et al., (2024); McGee et al., (2024). Moreover, the VSN psychoeducation, help promote hope and reduce burden among family caregivers of patients with schizophrenia (Kaewwanna, Bhatarasakoon, & Kitsumban, (2023); Kim, & Park, (2023); Martinez et al., (2023); Erkuş, & Gümüş, (2024).

Therefore, the aim of this study was to determine the effect of virtual social network-based psychoeducation intervention on the level of hope and caregiving burden among family caregivers of patients with schizophrenia.

Hope is an overall perception of achieving one's goals. Therefore, it can be said that goal-directed thinking consists of two interrelated components: agency (the individual's perceived capacity to reach goals), and pathways (the individual's perceived ability to generate routes) (Seyedfatemi, Asl, Bahrami, & Haghani, 2021).

The finding of the present study revealed that there was a significant difference between the overall adult hope scale at pre, post, and one month after intervention. This may be because the virtual social network-based psychoeducation interventions provided a platform for individuals to connect with others in groups who may be experiencing similar challenges. Interacting with supportive peers can foster a sense of belonging and reduce feelings of isolation, which are crucial for maintaining hope.

This result agreed with Maghsoudi, Alavi, and Akbari (2022) who found that the level of hope of family caregivers of chronic mental patients was not at an optimal level, and using psychoeducational programs based on their psychosocial needs could have been effective in improving their hope, knowledge level, and thus their quality of life.

On the other hand, Chien, Leung, Yeung, and Wong, (2013). concluded that the specific effects of family intervention on caregivers' psychosocial needs have not

been studied adequately and the approaches to psychosocial interventions for caregivers of patients with schizophrenia have their strengths and weaknesses particularly indicating limited evidence on long-term effects. To improve the long-term outcomes, they recommended the integration of evidence-based virtual social network-based psychoeducation sessions into activities and family psychoeducation and/or behavioral should approach to at least 10 sessions over the course of 6 months to be more effective and have a relatively long-lasting effect.

Concerning the caregiver's burdens, the present study displayed that there was a positive difference between the mean scores of caregiver's burdens at pre, post, and one month after intervention. This may be because VSN psychoeducation intervention offered opportunities for caregivers to connect with peers, share experiences, emotional support, coping skills, and receive validation and support which in turn reduced their feelings of loneliness. This was reported by some caregivers as they mentioned that virtual psychoeducation is a convenient and easy method for gaining information and support.

Similarly, Lohrasebi, Maghsoudi, Alavi, and Akbari, (2023) conducted a pre/post quasi-experimental study on a VSN psychoeducation program for Iranian caregivers of patients with first-episode psychosis and it found a significant difference between means after the intervention, and the psychoeducation program was effective in reducing caregiver burden. Also, they concluded that their study provided evidence for the effectiveness of VSN psychoeducation program in improving the perceived burden of the caregiver and suggested that it can be an integral part of the psychiatric services, provided to patients and their caregivers.

Overall, the literature suggests that VSN psychoeducation can be a valuable tool in decreasing the burden of caregivers of individuals with schizophrenia. These interventions have the potential to provide

support, increase hope, and improve resilience among caregivers, ultimately enhancing their overall well-being, and enhancing their quality of life (Ahmadi et al., (2022); Maghsoudi et al., 2022; Shamseddin et al., (2021).

However, A study by Noel, Lackey, Labi, and Bouldin (2022), declared that using a VSN psychoeducation for caregivers with mental disorders at United States did not affect their level of burden, as the caregiving burden depends on many factors, such as the severity, type, and duration of behavioral symptoms, the stage of the disorder, available support services, and facilities, the relationship between the caregiver and the patient, time and number of hours spent on care and health status of the patient with mental disorders.

Regarding the total mean score of knowledge and skills of caregiving, it was noticed that there is a strong statistically significant difference between level of knowledge and skills at pre, post and one month after intervention. This may be as VSN psychoeducation provided information, training, and support in an easy and convenient manner, caregivers can access resources and education without the need for in-patient meetings which give them the opportunities to ask and discuss freely.

This goes in the same line with Yank et al., (2021) who studied “improving uptake of a national web-based psychoeducational workshop for informal caregivers” at United States. They applied a 6-week interactive psychoeducational and self-management program aimed to reduce caregivers’ stress and depression and increase caregiver skills and self-efficacy and found that VSN psychoeducation programs have been shown to be effective in improving knowledge and skills among caregivers of patients with first-episode psychosis.

Moreover, Gabra, Ebrahim, Osman, and Al-Attar, (2020) applied a cross-sectional study to assess the caregivers’ knowledge and attitude towards mental illness, revealed

that the studied caregivers had poor knowledge on mental illness. They concluded that Egyptian psychiatric institutions should provide educational programs to family caregivers of mentally ill patients to improve their knowledge on mental illness and to enable them to cope and support more control on their relatives’ illness.

Conversely, Mueser et al., (2022) studied telehealth-based psychoeducation for caregivers using educational sessions and found that the obtained results did not meet the aim of their study. They referred that to inadequacy of the number of sessions provided, focus on caregivers-only intervention, difficulties with enrollment, the clinician provided the sessions was not a member of the treatment team; therefore, progress in the program was not integrated with patient care, and difficulties in caregiver–treatment team coordination. So, they recommended applying telehealth-based family/patient psychoeducation platforms to increase benefits to both patients and families with lasting sessions for more than 16 sessions.

In the present study, the relationship between the caregivers’ hope, burden, and knowledge and skills was tested along the pre, post, and after one month of the intervention. It was revealed that there was a strong correlation between the three variables pre-intervention. In the post-intervention and one month after, there was a strong correlation between them except knowledge and skills and hope. This could be explained as with the increased level of knowledge and improvement of skills, the caregivers acquire information about illness, coping skills and emotional support that lowered their burden and enhanced their hope level.

This is also supported by Siddiqui, and Khalid, (2019) who studied “determining the caregivers’ burden in caregivers of patients with mental illness” at Pakistan and found a strong negative correlation between the

caregivers' knowledge and skills and their burden.

Although, Zhou et al., (2021) addressed that there is a lack of clarity regarding the correlation of caregiving knowledge and skills with caregivers' experiences of patients with schizophrenia. They also found that no relationship was found between the caregivers' knowledge and skills and their burden but was positively associated with caregiving rewarding feelings such as hope.

Conclusively, hope has been identified as a mediator of stress to reduce burden in family caregivers, highlighting the importance of emotional health and self-care activities for caregivers, VSN psychoeducation was found to be more beneficial for caregivers of patients with schizophrenia (Amaresha, Virupaksha, Venkatasubramanian, Muralidhar, & Subbakrishna, 2024). Overall, understanding the factors influencing caregiver burden and implementing strategies to support caregivers, such as VSN psychoeducation, can help reduce the burden experienced by individuals caring for loved ones with schizophrenia (Sztramko et al., (2021).

Conclusion

Based on the results of the present study it can be concluded that before the intervention, the level of hope was low, and the burden was high among most of the family caregivers of patients with schizophrenia. After implementing the (VSN) psychoeducation intervention, the results showed a significant increase in the level of hope and a decrease in all areas of burden among these family caregivers.

In the light of the results of the present study, the following recommendations are suggested:

I. Recommendations geared toward the patients with schizophrenia and their family caregivers:

- Integrating the virtual social network-based psychoeducation intervention into long-term

guidance, and follow-up for caregivers of patients with schizophrenia.

- Virtual social network-based psychoeducation platforms should be structured or designed based on caregivers' needs to ensure that the interventions are family-centered and effective.
- The discharge plan for patients with schizophrenia should include a (VSN) psychoeducation for their family caregivers as part of activities of daily living.

II. Recommendations geared toward the psychiatric nurses, other health care providers, and hospital administration:

- Integrating the virtual social network-based psychoeducation protocol to the traditional system of psychiatric hospitals' routine of care to increase the accessibility of psychiatric interventions throughout the country.
- Implementing regular workshops for psychiatric nursing staff and health care providers about the importance of incorporating web-based psychoeducation skills in the treatment and rehabilitation process.

III. Recommendations geared toward nursing education:

- Healthcare educators need to update their traditional pedagogical methods to be more compatible with the current era of technology.

IV. Recommendations geared toward future research:

- Future studies are needed to determine the sustainability of the effect of the VSN intervention and the feasibility of its applications in the community to investigate its effect on patients' recovery after

they have been discharged from the hospital.

Table (1): Distribution of studied caregivers of patients with schizophrenia according to their socio-demographic characteristics (n = 41)

| Caregivers' socio-demographic characteristics | No. | % |
|--|--------------|------|
| Sex | | |
| ▪ Male | 9 | 22.0 |
| ▪ Female | 32 | 78.0 |
| Age | | |
| ▪ 20 – | 2 | 4.9 |
| ▪ 30 – | 11 | 26.8 |
| ▪ 40 – | 10 | 24.4 |
| ▪ 50 + | 18 | 43.9 |
| Min. – Max. | 27.0 – 64.0 | |
| Mean ± SD | 46.0 ± 11.27 | |
| Kinship to the patients | | |
| ▪ Mother/Father | 16 | 39.1 |
| ▪ Husband/Wife | 9 | 22.0 |
| ▪ Brother/Sister | 15 | 36.5 |
| ▪ Son/Daughter | 1 | 2.4 |
| Marital status | | |
| ▪ Single | 4 | 9.8 |
| ▪ Married | 26 | 63.4 |
| ▪ Divorced/Widow | 11 | 26.8 |
| Education level | | |
| ▪ Read and write | 5 | 12.2 |
| ▪ Basic Education | 3 | 7.3 |
| ▪ Secondary | 25 | 61.0 |
| ▪ University | 8 | 19.5 |
| Working status | | |
| ▪ Not working/ Housewife | 26 | 63.4 |
| ▪ Working | 10 | 24.4 |
| ▪ Retired | 5 | 12.2 |
| Income | | |
| ▪ Enough/Enough and more | 10 | 24.4 |
| ▪ Not enough | 31 | 75.6 |
| The presence of physical health problems | | |
| ▪ Yes | 8 | 19.5 |
| ▪ No | 33 | 80.5 |
| Type of caregiver's physical health problem (n = 8) | | |
| ▪ Diabetes mellitus | 3 | 37.5 |
| ▪ Hypertension/Liver disease | 5 | 62.5 |
| The presence of additional co-caregivers | | |
| ▪ No one | 5 | 12.2 |
| ▪ Mother/Father | 15 | 36.6 |
| ▪ Husband/Wife | 2 | 4.8 |
| ▪ Brother/Sister | 12 | 29.3 |
| ▪ Others (Daughter, Son, Grandmother) | 7 | 17.0 |
| Duration of being a caregiver (in years) | | |
| ▪ 1 - | 25 | 61.0 |
| ▪ 5 - | 13 | 31.7 |
| ▪ 10 + | 3 | 7.3 |
| Min. – Max. | 1.0 – 12.0 | |
| Mean ± SD | 4.63 ± 2.66 | |

Table (2): Comparison between levels of hope among the caregivers of patients with schizophrenia at pre-post and one month after intervention (n = 41)

| Levels of Adult Hope Scale (AHS): (Tool II) | Pre | | Post | | One month after the intervention | | Fr | p |
|---|-----|------|----------------------|------|----------------------------------|------|---------|---------|
| | No. | % | No. | % | No. | % | | |
| ▪ Hopelessness/ Low hope: (4 - < 8) | 36 | 87.8 | 5 | 12.2 | 0 | 0.0 | 67.746* | <0.001* |
| ▪ Moderate hope: (8 - < 12) | 5 | 12.2 | 30 | 73.2 | 29 | 70.7 | | |
| ▪ High hope: (12 - 16) | 0 | 0.0 | 6 | 14.6 | 12 | 29.3 | | |
| P | | | P1 <0.001* | | P2 <0.001* | | | |

Fr: Friedman Test

p1: p-value for comparisons: Bonferroni pre-intervention with post-intervention

p2: p-value for comparisons: Bonferroni pre-intervention with one month after intervention

* Statistically significant p-value at ≤0.05

Table (3): Comparison between the levels of caregiver’s burden of patients with schizophrenia at pre-post and one month after intervention (n = 41)

| Levels of Caregiver Burden Inventory (CBI): (Tool III) | Pre | | Post | | One month after the intervention | |
|--|-----------------------------|------|-----------------------|------|----------------------------------|------|
| | No. | % | No. | % | No. | % |
| ▪ Mild (Score: 0-17) | 0 | 0.0 | 0 | 0.0 | 4 | 9.8 |
| ▪ Moderate (Score: 18-26) | 3 | 7.3 | 12 | 29.3 | 9 | 22.0 |
| ▪ Severe (Score: ≥27) | 38 | 92.7 | 29 | 70.7 | 28 | 68.3 |
| Overall Caregiver Burden Inventory (CBI) | | | | | | |
| ▪ Total score | | | | | | |
| Min. – Max. | 44.0-89.0 | | 44.0-73.0 | | 37.0-71.0 | |
| Mean ± SD | 67.15±9.90 | | 57.73±8.41 | | 53.27±7.81 | |
| ▪ Percent score | | | | | | |
| Min. – Max. | 27.0-90.7 | | 28.3-68.3 | | 18.7--65.3 | |
| Mean ± SD | 59.24±13.78 | | 46.58±11.71 | | 40.44±10.82 | |
| F (p) | 65.989* (<0.001*) | | | | | |
| P | | | P1= <0.001* | | P2= <0.001* | |

F: ANOVA with repeated measures

p1: p-value for comparisons: Bonferroni pre-intervention with post-intervention

p2: p-value for comparisons: Bonferroni pre-intervention with one month after intervention* Statistically significant p-value at ≤0.05

Table (4): Correlation between overall scores of hope, burden, and knowledge & skills at pre-post and one month after intervention among the caregivers of patients with schizophrenia (n = 41):

| Overall (CBI & KSCS) | r/p | Pre-intervention | | Post-intervention | | One month after the intervention | |
|----------------------|-----|------------------|---------------|-------------------|---------------|----------------------------------|---------------|
| | | Overall (AHS) | Overall (CBI) | Overall (AHS) | Overall (CBI) | Overall (AHS) | Overall (CBI) |
| Overall (CBI) | R | -0.422 | | -0.360* | | -0.282 | |
| | P | 0.006* | | 0.021* | | 0.074 | |
| Overall (KSCS) | R | 0.420 | -0.337 | 0.238 | -0.312 | 0.167 | -0.191 |
| | P | 0.006* | 0.031* | 0.133 | 0.047* | 0.298 | 0.233 |

r: Pearson coefficient

p: p-value for comparisons: Bonferroni pre-post-intervention, and one month after intervention

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