Effect of Music Listening on Psychotic Symptoms, Attention and Social Skills among Patients with Schizophrenia

Heba Abdel-Hamid Hammad, Assistant lecturer
Psychiatric Nursing and Mental Health, Faculty of Nursing, Damanhur University

Sanaa Habashy Abed El Mageed Shaheen, Professor
Psychiatric Nursing and Mental Health, Faculty of Nursing, Alexandria University

Fatma Hussein Ramadan, Professor
Psychiatric Nursing and Mental Health, Faculty of Nursing, Alexandria University

Heba Mohamed Samy Mostafa, Assistant Professor
Piano, Faculty of Specific Education, Alexandria University

Abstract:

Background: *Psychotic symptoms, attention deficits, and poor social skills are key features of schizophrenia and the most incapacitating aspects of functioning. Music is a widely utilized form of complementary therapy and has been used for various psychotic disorders to improve the individual emotions, cognitive, behaviors and communication, but its role for schizophrenia still inconclusive.* Objective: *The aim of this study was to determine the effect of music listening on psychotic symptoms, attention and social skills among patients with schizophrenia.* **Setting:** *The study was conducted in the inpatient wards at EL-Maamoura Hospital for Psychiatric Medicine.* **Subjects** *the study subjects comprised 60 inpatients with schizophrenia.* **Tools:** *Socio-Demographic and Clinical Data Structured interview Schedule, The Brief Psychiatric Rating Scale (BPRS- version 4.0), Attention questionnaire scale, Social skills assessment screening scale (SSASS), and The Nurses' Observation Scale for Inpatient Evaluation (NOSIE) were used as tools for data collection.* **Results:** *Findings of the present study revealed that there was a statistically significant decrease in the total mean scores of psychotic symptoms among the study group after intervention (p=<0.001). In addition, the study group had a significantly increased level of attention and social skills compared to the control group (p=<0.001).* **Conclusion:** *In conclusion, the findings of the present study support the hypothesis that patients with schizophrenia who listen to music exhibit lower psychotic symptoms and their attention and social skills improved comparing with those who follow the traditional hospital routine care.* **Recommendations:** *Psychiatric hospitals may consider added music therapy to the standard care of patients with schizophrenia. Future studies are needed to determine the sustainability of the effect of group music listening on patients' mental health and their ability to return to the community.*

Key words: Music Listening, Psychotic Symptoms, Attention, Social Skills, Schizophrenia.

Introduction

Schizophrenia is one of the most serious mental disorders. It affects about seven per thousand of the adult population worldwide, especially those in the age group of 15-35. Although its incidence is low (3 per 10,000), the prevalence is high due to the chronicity of the illness (World Health Organization [WHO], 2019).

Attention deficits are considered to be fundamental in patients with schizophrenia (Kaneko, 2018). It seems to have a predictive value for global functioning in patients with schizophrenia (Zhang et al.,

2018). Moreover, attention seems to be a key indicator of social skills and social problem-solving. The performance of social skills is inversely correlated with attention deficits, which are particularly detrimental to social interaction (Huang et al., 2020) .

Deficits in social-skills are one of the hallmarks of schizophrenia which affect the ability to achieve meaningful social relationships, maintain employment, and fulfill personal needs. This emphasizes the importance of attention and social-skills as a target for psychosocial rehabilitation of people with schizophrenia (Barnes et al., 2020; Scemes et al., 2016).

Although antipsychotic drugs are effective in the treatment of positive symptoms, social skills and attention deficit are more resistant to drug treatment (Elkis, & Buckley, 2016). Therefore, it is necessary to complement medication with psychosocial interventions (Yildiz et al., 2019).

Music intervention is an effective therapeutic tool that may have positive effects on patients with schizophrenia when used as an adjunct to pharmacotherapy (Pedersen et al., 2019). Most studies on music listening among patients with schizophrenia have been done with Western Classical music – Mozart, it is the most highly publicized music used in this area. It is recommended as the most safest and low-risk music genre for such patients (De Sousa & De Sousa, 2019; Xing et al., 2016; Yang et al., 2018).

Listening to music is becoming a well-researched, evidence-based nursing intervention, in which psychiatric nurses use a recovery oriented and bio-psychosocial model of holistic care (Adams& Drake, 2006).Music intervention can be initiated by nurses, easily implemented, and is deemed less expensive to administer. It is safe and not associated with any adverse effects (Oldland et al., 2020).

Music listening intervention is not adequately reflected in mental health nurses' research, practice, or mental health care in Egypt, despite the fact that the therapeutic effect of music has been recognized over the years and its benefits have been documented among patients with schizophrenia. Fortunately, a recent study conducted in Egypt by Hammad et al. (2018) has indicated that both psychiatric patients and healthcare providers valued the use of music as an intervention. Also, she found that both of them have positive attitudes toward the use of music as therapy in psychiatric hospitals. So there is a tremendous need to adopt these findings into practice as baseline data to determine the effect of music listening on psychotic symptoms, attention, and social skills among patients with schizophrenia.

Aims of the study

This study aims to determine the effect of music listening on psychotic symptoms, attention and social skills among patients with schizophrenia.

Research hypothesis:

- Patients with schizophrenia who listen to music exhibit lower psychotic symptoms than those who follow the traditional hospital routine care.
- Patients with schizophrenia who listen to music exhibit improved attention than those who follow the traditional hospital routine care.
- Patients with schizophrenia who listen to music exhibit improved social skills than those who follow the traditional hospital routine care.

Materials and Method

Materials:

Research design: A Quazi-experimental design was used in this study

Settings: The study was conducted in the psychiatric inpatient wards of EL-Maamoura Hospital for Psychiatric Medicine that affiliated to the Ministry of Health and population. It serves three governorates namely Alexandria, Matrouh, and El-Beheira.

Subjects: The subjects of the study consisted of 60 patients with schizophrenia with the following inclusion criteria:
- Free from co-morbidity.
- Able to communicate coherently and relevantly.
- After one week of admission.
- Aged from 20-50 years.
- Duration of illness not exceeding 10 years.
- Able to mingle in a group.

This subjects were equally divided into two groups (study and control group) matched as much as possible.

Tools: the following tools were used to collect data in this study:

Tool I: The Brief Psychiatric Rating Scale (BPRS- version 4.0):

It was developed by Ventura et al., 1993 to gather information about the presence and severity of various psychiatric symptoms. In 2008, Kopelowicz et al. computed BPRS items to four groups including positive symptoms, negative symptoms, depression- anxiety, and agitation-mania. In addition, four symptoms including somatic concern, hostility, elevated mood and self-neglect are added to the above groups.

The scale comprised 24 items; each item was rated on a 7 point Likert scale ranging from 1 (not present) to 7 (extremely severe). The total scores ranged from 24 to 168, with lower scores indicating less severe psychopathology. It has been used and standardized in previous studies on Egyptian population (Elnakeeb, 2013; Khedr, 2020). It was tested for validity and reliability by Elnakeeb (2013) and the Cronbach's alpha was 0.71.

Tool II: Attention questionnaire scale

Attention questionnaire scale (AQ) was developed by Paraschi (2015) to assess attention for patients suffering from schizophrenia .

The scale consisted of twelve items. Each item was rated on a five point Likert scale from strongly disagree (=5) to strongly agree (=1). The total scoring system ranged from 12-60, with higher scores indicating better attention.

Tool III:-Social skills assessment screening scale (SSASS)

The scale was developed by Bhola et al. (2016) to measure social skills deficits among inpatients with severe mental illnesses. It consisted of 20 items were grouped into three broad domains; nonverbal communication (4 items), verbal communication (6 items) and social behavior (10 items). Each item was rated on a two- point scale (0 = inadequate, 1 = adequate).The scoring system ranged from 0-20, with lower scores indicating low social skills.

Tool IV:- The Nurses' Observation Scale for Inpatient Evaluation (NOSIE)

The scale was designed by Honigfeld and Klett (1965) to assess behaviors of inpatients at psychiatric unit.

The NOSIE comprised 30 items which subdivided into seven domains (social competence, social interest, personal neatness, irritability, manifest psychosis, retardation, and depression). The first 3 domains reflect positive behavioral dimensions, and the other 4 are indicators of negative behaviors. It was rated on a 5-point Likert Scale (0–5), which had a range of "never: Zero" to "always: 5." The high score of behavior indicates its more frequent and lower score, indicating less repetition or nonoccurrence of a particular behavior.

In addition, a demographic and clinical data structured interview schedule was used.

Method:

Official written permissions were obtained from the General Secretariat of Mental Health at the Ministry of Health and Population in Cairo and from the hospital director and director of Training Unit at EL-Maamoura Hospital for Psychiatric Medicine, in Alexandria.

The study tools (II, III and IV) were presented to a jury composed of five experts in the field of psychiatric and mental health nursing to examine the face and content validity. Opinions of the experts on these tools were analyzed and this analysis revealed that these tools were valid.

The reliability of tools (II), (III) and (IV) was tested using Cronbach's alpha test. The reliability coefficient for the tools (III), (IV) and (V), it was 0.967, 0.959 and 0.948 respectively. A pilot study was carried out on 10% of the total subjects' size prior to the actual study.

Actual Study

Data were collected from four psychotic male patient wards using simple random sampling technique to determine the first, second, third and fourth' selected ward.

The first and second selected wards were assigned for the study groups.

Five patients with schizophrenia who met the inclusion criteria were selected randomly from patients' list to receive 24 sessions of music listening intervention over period of four weeks. Then the selection of another five patients was repeated until the required number of the study subjects was achieved.

The control groups were chosen from the third and fourth ranked inpatient's wards to avoid contamination between the two groups and were matched with the study group as much as possible in terms of age,

educational level and types of medication. Patients in the control group were underwent the traditional hospital routine care only.

Each patient was interviewed individually to apply tool II (BPRS), tool III (AQ) and tool IV (SSASS).

Nurses' observation scale for inpatient evaluation was completed each week for both study and control group; to assess to the patient's behavior.

Post evaluations of patients were carried out immediately after termination of the music intervention protocol, using the same tools of data collection.

Music interventions protocol

Music listening intervention is composed of 24 sessions. Session frequency is as follows; one session / day (six sessions / week; twenty-four session / month).

Each session started with a warm-up (10 min), continued with the main activity "listening to music" (30 min), and a closing (10 min).

The music intervention sessions took place in in a quiet room in the hospital ward. Music was presented in stereo system through an HP Pavilion G Series laptop.

Ethical considerations:

Patients were informed about the purpose of the study and an informed written consent was obtained after explaining the aim of the study. Also they were told that participation was voluntary and they have the right to refuse or withdraw from the study at any time. Patients' privacy and data confidentiality were assured and maintained.

Statistical analysis:

The collected data was revised, categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Reliability of the tool was determined by Cronbach's alpha and

presented in descriptive, and association forms.

Results:

Table (1) shows the socioeconomic characteristics of patients in the study and control groups. Regarding age, 43.3 % of the study group and 53.3 % of the control group were being in the age group of less than 30 years. The table also reveals that 50 % of the study group and 60% of the control group were living in urban areas.

As regards patient's level of education, an equal percentage (26.7%) of both the study and control groups was highly educated, while those who had secondary education represented 33.3 % of the study group and 30 % of the control group. Those who were single patients constituted 70 % and 63.3% of the study and control group respectively.

The table also showed that 63.3% of the study group and 50% of the control group were living with one or both of the parents. In relation to perceived support, 73.3% of the study group and 80% of the control group were stated that they have no support, while 26.7% of the study group and only 20% of the control group were stated that they were supported; of those, 62.5% and 83.3 % said they have only financial support.

Table 2 shows the clinical characteristics of the studied patients in the study and control groups. The duration of current hospitalization ranged between 1 to 3 months for 56.7% of patients in the study group and 50 % for those in the control one .

As regard the onset of the illness, 56.7 % of the study group began to have the illness at the age of 25 years to less than 35 years compared to 63.3 % of the control group. In addition, 36.7% and 53.3% of the study and control group respectively admitted for three to less than six times. Typical antipsychotics were the most frequent prescribed medication for the study and control groups and 16.7% of them received ECT.

Table 3 displays a comparison between levels and mean scores of psychiatric symptoms among the study and control group at pre and post intervention. 70% of the study group had moderate level of psychiatric symptoms, on post-intervention the level of psychiatric symptoms dropped to mild level. 30% of the patients still had moderate level of psychiatric symptoms. The variation was statistically significant (MH =30.00, P= <0.001), indicating general decrease in psychiatric symptoms severity. For the control group even after intervention have moderate level of psychiatric symptoms at pre and post intervention (63.3%, 73.3%) respectively with insignificant difference (MH =5.500, P= 0.564). The table also shows that there was no statistical significant difference in the level of psychiatric symptoms between study and control group at pre intervention phase $\chi2$=0.965, p=0.710). While, after intervention a statistically significant difference was found between them ($\chi2$=13.441, p=0.001).

Table 4 presents the mean scores of attention among the study and control group at pre and post intervention. It can be noticed from the table that the mean scores of attention among the study group was significantly increased after implementing the music listening intervention with a statistically significant difference (t=16.803, p= <0.001). As for the control group, the mean score was slightly increased with no statistical significant difference (t=0.396, p= 0.695) .

Regarding the total mean score of attention, the table shows that there was no statistical significant difference between study and control group before implementing the intervention (t=1.773, p=0.083). In contrast, a statistical significant difference was found after implementing the intervention between the

study and control group (t=9.479, p=<0.001).

Table 5 highlights the means scores of "social skills" among the study and control groups at pre and post music listening intervention. The table shows that the mean scores of the total social skills among the study group were significantly increased immediately after applying music listening intervention (Z=4.786*, p=<0.001). In relation to control group, there was no statistical significant difference between two period of measuring the social skills (Z=0.078, p=0.938). There was no statistical significant difference between study and control groups in total mean score of the social skills at pre intervention phase (U=373.500, p= 0.256). On the other hand, a statistical significant difference was found after implementing the intervention between the study and control groups in total mean score of social skills (U=0.000, p =<0.001).

Discussion

Despite long years of pharmacological and psychosocial interventions, schizophrenia remains one of the most leading causes of social and functional disability (Beyene et al., 2021). Psychopathological symptoms, attention and social skills deficits are one of the most crippling aspects of functioning in patients with schizophrenia (Correll & Schooler, 2020; Vaskinn & Horan, 2020).

Listening to music may be used as an adjunctive nonpharmacological treatment modality to tackle symptoms of schizophrenia (Geretsegger et al 2017). Some studies found a positive impact of music listening on certain symptoms, while others found no effect at all (Ahuja et al, 2020; Kamioka et al., 2014; Na & Yang, 2009). Therefore, the present study was carried out to determine the effect of music listening on psychotic symptoms, attention and social skills among patients with schizophrenia.

The results of the present study indicate a positive effect of music listening intervention on the overall psychiatric symptoms among the patients in the study group as compared to those in control one. Such improvement could be attributed to the fact that listening to music is one of the most effective stress coping strategies that can alleviate a patient's distressing psychotic experiences.

Moreover, Mozart's K. 545 sonata is an effective intervention and well-tolerated by patients with schizophrenia, this type of classical music affects positively the neural mechanisms underlying cognitive and emotional process in schizophrenia. It triggers a sequel of cognitive and emotional components with distinct neural substrates, causing psychotic symptom remission among patients with schizophrenia (Lin et al., 2013; Nizamie & Tikka, 2014; Yao et al., 2020).

On the other hand, the group-based music intervention in the present study may elicit extra stimulation for the studied patients to be more reality-oriented, and less self-absorbed and withdrawn. Also, these help patients to practice and attend their attention daily for one month.

Indeed, the social experiences within the group act as a social stimulation that may help patients to be attached with the present moment. This can help them focusing their attention and detaching themselves from their symptoms as a means of coping with the distressing symptoms. Furthermore, the psychotic symptoms improvement in the current study could be related to the structure of the music listening environment. Warm greeting and continuous encouragement make them more connected and comfortable during the sessions that allowed them to feel safe, relaxed and compliant.

Consistent with the present study results, He et al. (2018) and Yang et al.

(2018) reported that patients with acute schizophrenia showed significant reduction in psychiatric symptoms after 1 month of listening to Mozart music. They revealed that listening to music could improve the functional connectivity in patients with schizophrenia, thus improving their psychiatric symptoms.

Speaking of attention, the findings of the current study revealed that there is a significant increase in the mean scores of attention among the patients in the study group compared to those in the control group after implementing the music listening intervention. This could be attributed to the positive symptoms improvement. This is consistent with the feedback of the studied participants in the present study who reported that after listening to music, they become more alert, focused, and concentrated when doing tasks instead of wandering aimlessly and being easily distracted before listening to Mozart music.

Furthermore, Mendes et al. (2021) found that listening to a classical music increases positive emotion and arousal levels, benefitting cognitive tasks, allowing the listener to block out irrelevant cues. It has been suggested that music itself contains therapeutic elements that improve attention skills. For instance, rhythmic patterns direct attention focus, and musical components like rhythm, melody, and harmony offer multidimensional stimuli that make it easier to switch attention and additionally, affect how the frontal-parietal system operates the activities of attention. (Khalaf-Beigi, 2012).

The results of the present study were in agreement with Kwon et al (2013) who indicated that music listening intervention had improved the cognitive function including attention in patients with schizophrenia. Moreover, Yao et al. (2020) and Yang et al. (2018) reported that music interventions particularly Mozart music listening were found to be effective in improving and maintaining attention in patients with schizophrenia.

As regards social skills, the results of the present study indicate a significant improvement of social skills of patients with schizophrenia. Immediately after the intervention there is a significant increase in the mean scores of the social skills in the study group compared to the control group. Based on the current study results, this finding could be attributed to the significant reduction in the negative symptoms as assessed by BPRS.

In the same vein, the patients' feedback in the present study reflects the positive impact of music listening on enhancing social skills, particularly verbal communication and social behavior. The studied patients claimed that they became able to listen to, initiate and sustain a conversation or interaction with group members. Also, they reported that music listening allowed them to express emotions, recognize others' emotions, empathize with others, understand their perspective, and create a safe environment to share their experiences.

Moreover, it was found that listening to Mozart's music triggers the release of dopamine, which is associated with pleasure and reward centers, serotonin, and oxytocin, which fosters the ability to connect to others (Chanda, & Levitin, 2013). According to He et al. (2018), listening to classical music combined with medication helped to improve social skills in patients with schizophrenia.

In summary, this study showed that the psychiatric symptoms, attention, and social skills of patients with schizophrenia can be managed effectively by using music listening intervention in conjunction with antipsychotic drugs and it can be utilized as one of the psychiatric nursing interventions.

Conclusion:

In conclusion, the findings of the present study support the hypothesis that patients

with schizophrenia who listen to music exhibit lower psychotic symptoms and their attention and social skills improved comparing with those who follow the traditional hospital routine care.

Recommendations

Based on the findings of the current study, the following recommendations have been generated:

- Music listening intervention should be used as an integral part of the hospital routine for managing patients with schizophrenia and be a part of patients` activities of daily living.

- More comparative studies are needed to determine whether the use of different types of music would have the same.

- Future studies are needed to determine the sustainability of the effect of music listening intervention after patients have been discharged from the hospital.

Table (1): Socio demographic characteristics of patients in study and control groups:

Socio-demographic characteristics	Study (n =30)		Control (n =30)		P
	No.	%	No.	%	
Age (years)					
<30	13	43.3	16	53.3	0.721
30-<40	9	30.0	8	26.7	
≥ 40	8	26.7	6	20.0	
Residence					
Rural	15	50.0	12	40.0	0.436
Urban	15	50.0	18	60.0	
Level of education					
Illiterate	3	10.0	5	16.7	
Read & write	4	13.3	5	16.7	
Primary/Preparatory	5	16.7	3	10.0	^{MC}p= 0.892
Secondary	10	33.3	9	30.0	
Highly educated	8	26.7	8	26.7	
Social status					
Single	21	70.0	19	63.3	^{MC}p= 0.787
Married	2	6.7	4	13.3	
Divorced / widowed	7	23.3	7	23.3	
Cohabitation					
Alone	5	16.7	6	20.0	
With one or both of the parents	19	63.3	15	50.0	^{MC}p= 0.581
With one of the siblings	5	16.7	5	16.7	
With husband / wife and children	1	3.3	4	13.3	
Work status					
Unemployed	11	36.7	15	50.0	0.297
Employed	19	63.3	15	50.0	
Type of job	(n = 19)		(n = 15)		
Student	1	5.3	1	6.7	
Employee	4	21.1	5	33.3	^{MC}p= 0.856
Worker	13	68.4	8	53.3	
Other	1	5.3	1	6.7	
Support					
Yes	8	26.7	6	20.0	0.542
No	22	73.3	24	80.0	
If there is support, what type it is	(n = 8)		(n = 6)		^{MC}p= 0.211
Social	0	0.0	1	16.7	
Financial	5	62.5	5	83.3	
Social and financial	3	37.5	0	0.0	

MC: Monte Carlo

p: p value for comparing between the studied groups

Table (2): Clinical characteristics of the studied patients in the study and control group.

Clinical characteristics	Study (n =30)		Control (n =30)		P
Duration of current hospitalization (months)					
< one month	10	33.3	10	33.3	^{MC}p= 0.827
1 – 3 months	17	56.7	15	50.0	
>3 months	3	10.0	5	16.7	
Duration of illness in years					
1 – <3 years	4	13.3	5	16.7	^{MC}p= 0.312
3 – <6 years	8	26.7	13	43.3	
≥ 6 years	18	60.0	12	40.0	
Onset of illness (years)					
15 -<20	8	26.7	6	20.0	0.820
20 - <25	5	16.7	5	16.7	
25 - >35	17	56.7	19	63.3	
Number of previous hospitalization					
1 – <3	7	23.3	9	30.0	0.131
3 – <6	11	36.7	16	53.3	
≥ 6	12	40.0	5	16.7	
Medications currently prescribed for the patient*	No.	%	No.	%	
Typical anti-psychotic	15	50.0	16	53.3	
Atypical anti-psychotic	9	30.0	9	30.0	0.940
Mixed	6	20.0	5	16.7	
ECT	5	16.7	5	16.7	1.000

MC: Monte Carlo

p: p value for comparing between the studied groups

Table (3): Comparison between the study and control groups in relation to levels and mean scores of psychiatric symptoms at pre and post music listening intervention

Psychiatric symptoms	Study(n =30)				Control(n =30)				Test of Sig. (p₁)	Test of Sig. (p₂)
	Pre Intervention		After intervention		Pre intervention		After intervention			
	No.	%	No.	%	No.	%	No.	%		
Low (24-71)	6	20.0	21	70.0	9	30.0	7	23.3	χ^2= 0.965 (^{MC}p= 0.710)	χ^2= 13.441* (^{MC}p= 0.001*)
Moderate (72-120)	21	70.0	9	30.0	19	63.3	22	73.3		
High (121-168)	3	10.0	0	0.0	2	6.7	1	3.3		
MH (p₀)	30.00* (<0.001*)				5.500 (0.564)					
Total mean Score (24–168)										
Min. – Max.	55.0 – 131.0		34.0 – 98.0		46.0 – 126.0		46.0 – 124.0		t=1.728 (0.089)	t= 4.396* (<0.001*)
Mean ± SD.	90.87 ± 20.10		60.43 ± 16.62		82.10 ± 20.30		80.70 ± 18.46			
t₁ (p₀)	16.428* (<0.001*)				1.915 (0.065)					

MC: Monte Carlo   t: Student t-test   t₁: Paired t-test   MH:Marginal Homogeneity Test   p₁: Comparing between study and control group in pre intervention period

P₂: Comparing between study and control group in post intervention period

p₀: Comparing between before and after in each group

*: Statistically significant at p ≤ 0.05   SD: Standard deviation

Table (4): Comparison between the study and control groups in relation to mean scores of attentions at pre and post music listening intervention

Attention	Study(n =30)		Control(n =30)		Test of Sig. (p_1)	Test of Sig. (p_2)
	Pre Intervention	After intervention	Pre Intervention	After intervention		
Total Score (12–60)					t=1.773 (0.083)	t= 9.479[*] (<0.001[*])
Min. – Max.	16.0 – 35.0	31.0 – 60.0	12.0 – 45.0	15.0 – 47.0		
Mean ± SD.	22.83 ± 4.80	46.40 ± 7.13	26.10 ± 8.88	26.73 ± 8.85		
t_1 (p_0)	16.803[*] (<0.001[*])		0.396 (0.695)			

t: Student t-test t_1: Paired t-test
p1: Comparing between study and control group in pre intervention period
p2: Comparing between study and control group in post intervention period
p_0: p value for comparing between before and after in each group
*: Statistically significant at $p \leq 0.05$ SD: Standard deviation

Table (5):   Comparison between the study and control groups in relation to mean scores of social skills at pre intervention, post music listening intervention.

Social skills	Study(n =30)		Control(n =30)		Test of Sig. (p_1)	Test of Sig. (p_2)
	Pre Intervention	After Intervention	Pre Intervention	After Intervention		
Overall Social skills (0–20)					U=373.500 (0.256)	U=0.000[*] (<0.001[*])
Min. – Max.	0.0 – 15.0	15.0 – 20.0	0.0 – 10.0	0.00 – 11.00		
Mean ± SD.	5.90 ± 4.22	19.20 ± 1.47	4.57 ± 3.42	4.73 ± 4.62		
Z (p_0)	4.786[*] (<0.001[*])		0.078 (0.938)			

U: Mann Whitney test   Z: Wilcoxon signed ranks test
p1: Comparing between study and control group in pre intervention period
p2: Comparing between study and control group in post intervention period
p0: p value for comparing between before and after in each group
*: Statistically significant at $p \leq 0.05$ SD: Standard deviation

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