

# Mindfulness based mobile applications for social interaction in peoplersons with schizophrenia

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## Abstract

Peoplersons with schizophrenia experience limited social interaction because of affective, cognitive, and psychomotor alterations. The problem of interaction requires intervention to increase their social interaction. There is a need for a system that can monitor the development of the interactive social abilities of peoplersons with schizophrenia. The purpose of this study was to determine the impact of mindfulness therapy on the social interaction of peoplersons with schizophrenia using a mobile application (SI-DESI). Fifty-two peoplersons with schizophrenia who met the criteria were divided into the intervention group and the control group. The mindfulness therapy was carried out in six sessions for three weeks. Data were collected using pre-test and post-test scores with the Social Interaction Questionnaire and Behavior Observation Sheet. The results showed an increase in the level of social interaction for participants who were given the intervention ( $U = 12,000, p < 0.05$ ). The rise of social interaction emphasized the stages of mindfulness therapy: the comfort stage and the independently healthy target stage. Mindfulness therapy based on SI-DESI android application is useful to enhance the social interactions of peoplersons with schizophrenia.

**Keywords:** Mental illness; Mindfulness; Mobiles application; Schizophrenia; Social interaction

## Introduction

Schizophrenia is a mental condition that ~~often~~ occurs often in the community. It has two main types of symptoms; positive and negative (Malky, 2016). One of the negative symptoms in schizophrenia is a change in social function that persists all the time. This condition inhibits the recovery process, as well as roles and functions in daily activities (Acocella et al., 2006). The decline in social interaction is experienced by 72% of people with schizophrenia (Jumaini et al., 2010). In addition, peoplersons with schizophrenia also experience psychomotor disorders in the form of motor retardation (Bervoets et al., 2014). The surrounding environment such as family, neighbours, and friends also influences the social interaction of peoplersons with schizophrenia. Disorders that occur are affective, cognitive, and psychomotor, ~~and as well as~~ the absence of positive support from the environment can result in the ability of social interaction of peoplersons with schizophrenia to be less active. This has

an impact on the occurrence of self-exile and increased risk of suicide (Ventriglio et al., 2016) and depression (Sari et al., 2017). For individuals who experience persisting symptoms and mental disorder, personal recovery has become an important target of mental health services internationally (Thomas et al., 2016). Personal recovery can be achieved if people with a mental disorder can be independent and be positive (Thomas et al., 2016).

Handling social interaction problems in people with schizophrenia can be achieved with psychotherapy and mindfulness therapy (Dekeyser et al., 2007). Mindfulness therapy is useful in providing calm, comfort, being aware of and focusing on problems, and helping in solving problems independently (Davis et al., 2007). Mindfulness therapy has been proposed as an alternative to CBT (cognitive behavioural therapy) for use with people with a severe mental illness like schizophrenia who have cognitive impairment or disorganized thinking—as mindfulness improves emotion regulation (Mistler et al., 2017). So far, the development of mindfulness therapy is not only for direct research but also for indirect research in the form of android based applications. It is supported by a previous study on mindfulness therapy—as one of the holistic therapies developed with mobile technology that affects the recovery process for patients with mental illness (Stjernswärd et al., 2017). The development of nursing interventions in the form of an android application is a recent form of technological innovation in nursing science (Locsin and Kongsuwan, 2017). Technology in nursing is a development of nursing science based on caring for persons through technological means (Locsin and Kongsuwan, 2017).

Several android applications on mindfulness-based nursing interventions have been developed in Indonesia. One of them is SI-BESUTA (Learning Success Information System with Love), which measures the stress level of nursing students (Ningsih, 2018). The SI-BESUTA application motivates nurses, especially psychiatric nurses, to be able to develop technology to help people with schizophrenia. There are still very few technologies, such as the information systems designed in psychiatric nursing in Indonesia, that can assist nurses in providing interventions and monitoring patient development quickly and efficiently. Therefore, it is essential to create an android application that contains mindfulness therapy used to monitor social interactions of people with schizophrenia.

## Materials and methods

This study was approved by the Psychiatric Hospital in Central Java Province, and all respondents gave informed consent. All research respondents in this project were informed that participation was voluntary; had received an explanation of voluntary participation as research respondents, and they had the right to participate in the study at any time and could also resign at any time. Respondents in this study were selected using purposive sampling techniques in the inpatient room. The research lasted for one month with the help of nine enumerators. These were nurses who had received mindfulness training before the study began.

### *Participants*

The 52 ~~peoplersons~~ ~~who~~ participated in this study ~~and~~ were divided into ~~the~~ intervention and ~~the~~ control groups (~~26~~ ~~peoplersons~~ in each group). Participants included in this study were (1) persons with schizophrenia, (2) more than 18 years old, (3) persons in a stable condition measured by PANSS score of 10, ~~and~~ (4) could read and write. ~~Peoplersons~~ with schizophrenia ~~who were~~ undergoing ECT therapy and ~~had~~ ~~ving~~ organic mental disorders were excluded from the study.

### **Procedure**

The study began with the selection of respondents into the intervention and the control groups. The pre-test was conducted for both groups by enumerators using the Social Interaction Questionnaire and the Behavior Observation Sheet in the SI-DESI android application. The intervention group received 6 sessions ~~of~~ mindfulness therapy for three weeks. The steps of the mindfulness therapy are as follows: (1) regulate breathing and focus on awareness, (2) body scan by feeling pain in the body and enjoying the pain sincerely, (3) ~~f~~Feeling the comfort and benefits of interacting with others, (4) ~~a~~Accept the situation that is being experienced with sincerity and try to forgive others, ~~and~~ (5) ~~m~~Make healthy targets independently to interact with others.

The control group did not receive mindfulness therapy but received ~~the~~ treatment ~~as usual~~ (TAU) ~~that as~~ inpatients in psychiatric hospitals ~~usually receive~~.

The intervention was delivered by nine nurses in a psychiatric hospital. They received one-day training ~~infor~~ mindfulness. They were required to practice and implement the intervention and SI-DESI for the patients with schizophrenia. After seven days, they were given feedback for the intervention.

The steps to use Information System of Social Interaction's Detection (SI-DESI) (Fig. 1):

1. Login according to the account and password that has been registered (~~who may have an account is a research enumerator~~).
2. ~~I list used to enter patient data.~~
3. Pre-test on social interaction questionnaire.
4. Steps of mindfulness.
5. Record for documentation.
6. ~~Complete~~ ~~Do~~ the intervention six times and write the documentation ~~for~~ each intervention.

Comment [tc1]: confusing sentence

Comment [tc2]: confusing sentence

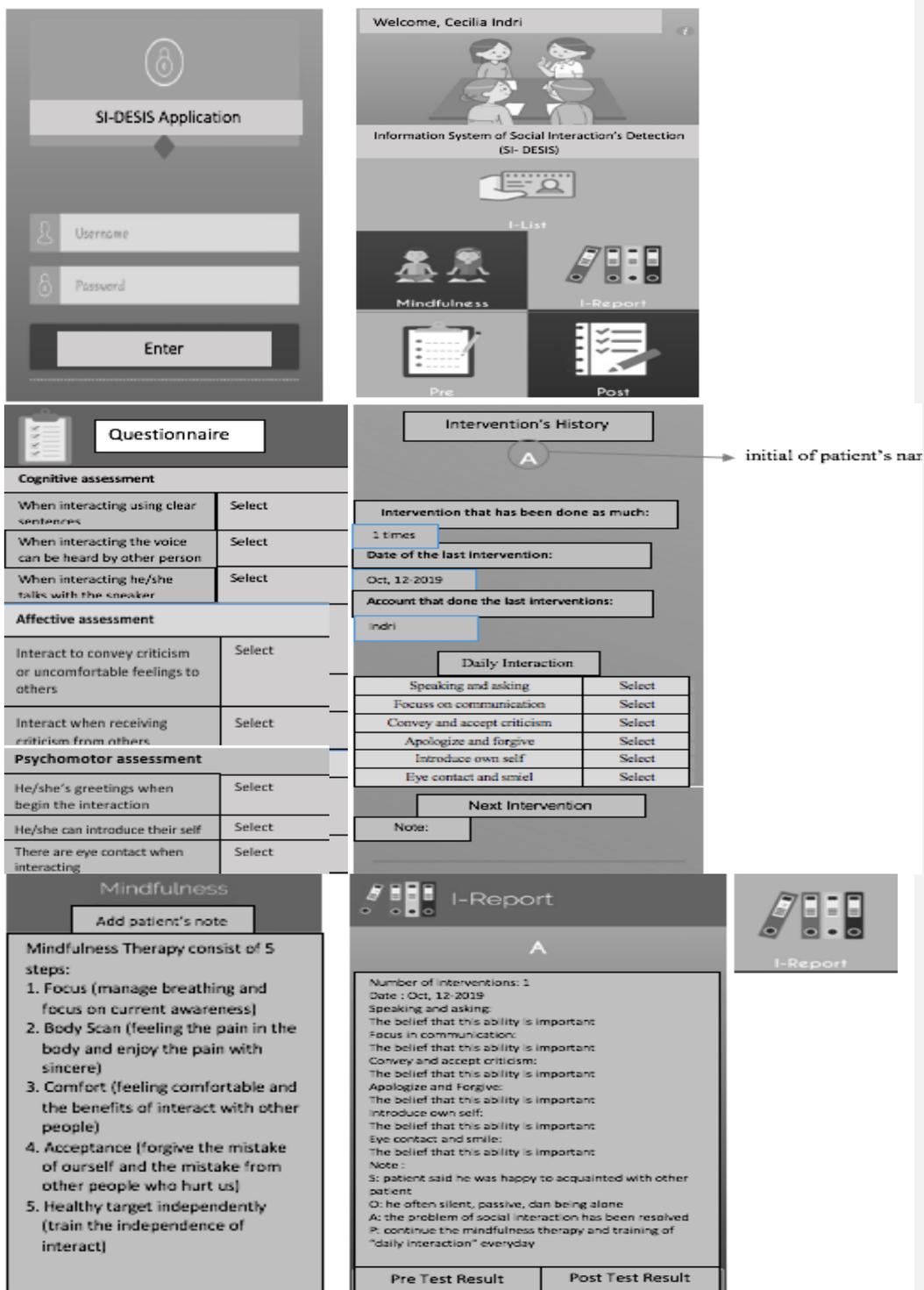


Fig. 1. Example of the content of SI-DESIS

### Instrumentation

The instruments used in this study were the Social Interaction Questionnaire and the Behavior Observation Sheet that had been tested for validity and reliability (Nyumirah, 2012). The validity test results of the Social Interaction Questionnaire and the Behavior Observation Sheet, obtained all valid question items with  $r$  table. The reliability test results on the Social Interaction Questionnaire and the Behavior Observation Sheet, stated that both instruments are reliable because they have a Cronbach Alpha  $>0.60$ . The Social Interaction Questionnaire consists of cognitive and affective aspects and haswith a total of 12 questions, while the Behavior Observation Sheet consists of 6 questions.

Comment [tc3]: confusing sentence, consider clarifying

### Data analysis

The data on patients characteristics between groups were analyzed by using the Chi-Square test and the Fisher Exact test. Pre and post test data on the Social Interaction Questionnaire and the Behavior Observation Sheet were analyzed by using the Wilcoxon statistical test. Post-test data of the intervention group and the control group were analyzed by using the Mann-Whitney test because the data were in the form of categories.

### Results

Based on the Table 1 shows, the majority of participants wereare male and unemployed. There wereare no significant differences in participants's characteristics between the intervention group and the control group ( $p > 0.05$ ).

Table 1. The characteristics of respondents in-between the intervention group and the control group

Respondents's characteristic	Intervention (n = 25)		Control (n = 25)		Statistic	p
	n	%	N	%		
Age	M (SD) 36,08 (12,62)		M (SD) 35,16 (10,06)		1,270 <sup>a</sup>	0,265
Gender						
Male	15	57,7	13	50,0	0,077 <sup>c</sup>	0,781
Female	11	42,3	13	50,0		
Education level						
Primary	12	46,2	15	57,7	0,698 <sup>b</sup>	0,705
Secondary	10	38,5	8	30,8		
Tertiary	4	15,4	3	11,5		
Occupation						
Employed	12	46,2	12	53,8	0,077 <sup>c</sup>	0,782

Unemployed	14	53,8	14	46,2
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Note: <sup>a</sup> Levene test; <sup>b</sup> Chi-square; <sup>c</sup> Fisher's exact test; M, Mean; SD, Standard Deviation

The Mann–Whitney test showed ~~that there was~~ an increase in the level of social interaction in the post-test after mindfulness intervention ( $p < 0.05$ ) (Table 2). This ~~indicated conclude~~ that there is a significant difference ~~bet~~ between both groups after mindfulness therapy through the application of SI-DESI (Social Interaction Detection Information System) on the level of social interaction of ~~peoplersons~~ with schizophrenia.

**Table 2. The effect of mindfulness therapy on social interaction in ~~peoplersons~~ with schizophrenia ~~in thebetween~~ two groups**

		Intervention (n = 26)		Control (n = 26)		U	p-value
		Mean	Sum	Mean	Sum		
		rank	rank	rank	rank		
<b>Social Interaction Level</b>	<i>Post-test</i>	39,04	1015,00	13,96	363,00	12,000	0,000

## Discussion

This study aimed to develop mindfulness through a mobile application on social interaction in persons with schizophrenia. Overall, the results showed a positive impact on enhancing social

Comment [tc4]: doesn't make sense

interaction among ~~peoplersons~~ with schizophrenia. This finding supports previous studies on mindfulness-based mobile apps. Mindfulness interventions can be provided through media assistance in the form of mobile apps or online mindfulness. Research conducted by Choo et al. (2018) explained that mindfulness therapy with a smartphone application had a positive impact on reducing the risk of suicide and increased emotional responses and interactions. Other studies conducted by Garcia et al. (2017) and Spikerjman et al. (2016) explain that mindfulness interventions provided through smartphone applications have a positive impact on improving quality of life, social response, and well-being.

The type of mindfulness therapy in this research was mindfulness self-care. Mindfulness self-care therapy ~~to helpfor~~ ~~peoplersons~~ with schizophrenia ~~in~~ ~~overcomeing~~ social interaction problems consists of five stages; ~~namely~~ (1) focus on awareness, (2) body scan, (3) comfort, (4) acceptance, ~~and~~ (5) independent healthy targets (Dwidiyanti et al., 2018). Mindfulness self-care can help the patient to gain insight and perspective, inner calm, and motivate ~~him or herthem~~ to be active in social life (Tabak et al., 2015). In the previous study, mindfulness self-care ~~can~~ increase independence among patients (Slatyer et al., 2017). Mindfulness self-care is useful when the third stage of this therapy (comfort stage) can be ~~felt~~ significantly ~~felt~~ by a ~~persons~~ with schizophrenia. When the comfort stage is useful, then the fourth and fifth stages (acceptance and independent healthy stages) will be automatically achieved.

Comment [tc5]: 'was shown to'?

~~In this study, t~~The increasing social interactions in ~~peoplepersons~~ with schizophrenia ~~in~~ ~~this study was~~ also influenced by the ability of psychiatric nurses ~~toin~~ ~~provideing~~ mindfulness therapy ~~and as well as the ability to~~ use the SI-DESI android application. Nurses were trained in mindfulness before ~~providinggiving~~ this therapy ~~to persons~~ (Wolf et al., 2016). A previous study conducted by Byron et al. (2014) explains ~~that nurses who have been trained and delivered to consumers~~ could support the recovery of patients faster. Furthermore, ~~psychiatric nurses~~ in this study ~~psychiatric nurses~~ have been able to emphasize the components of mindfulness therapy, especially the comfort stage and self-health~~y~~ targets. These components may make the patients feel a sense of comfort in their social interactions~~s~~ (Boardman, 2018).

Comment [tc6]: doesn't make sense - a product is delivered to consumers, not a person?

Social interaction is related to three main aspects: ~~of~~ affective, cognitive, and psychomotor. These three aspects are measured in ~~theis~~ SI-DESI application. Affective aspects in ~~peoplersons~~ with schizophrenia are associated with neurocognitive deficits, which result in impairment of attention function, visual memory, emotion, and social cognition. Emotional instability affects social responses and the interests and motivations of ~~peoplersons~~ with schizophrenia to interact with others (Kanchanatawan et al., 2017). ~~This~~ is supported by previous research by Martin et al. (2019) ~~which showed~~ that persons with schizophrenia had severe emotional instability in social interaction. Affective aspects can be trained by controlling emotions and increasing interest in recovery in ~~peoplersons~~ with schizophrenia (Hendler et al., 2018). In mindfulness therapy, the affective aspects training is included in the third and fourth stages, namely the comfort stage and the acceptance stage.

The next aspect is cognitive, which is related to the ability to communicate and focus when interacting (Berger et al., 2019). Previous research conducted by Stefanopoulou et al. (2009), states that persons with schizophrenia have memory delay, difficulty focusing ~~duringin~~ a discussion, and experie~~ncing~~ impaired verbal responses (Stefanopoulou et al., 2009). The

cognitive aspects of ~~peoplersons~~ with schizophrenia can be improved by cognitive remediation (Fioravanti et al., 2012). Cognitive remediation is an improvement in the cognitive or mind of ~~peoplersons~~ with schizophrenia. ~~It, which~~ is included in the initial stages of mindfulness therapy ~~—~~, namely awareness, and body scan.

The last aspect of psychomotor is related to general social skills such as greeting, smiling, and answering questions (Campellone and Kring, 2018). Psychomotor can influence the process of interaction. It means that the higher motor delays in ~~peoplersons~~ with schizophrenia, the higher the disruption of the interaction. Psychomotor aspects in ~~peoplersons~~ with schizophrenia can be improved by therapy that helps improve the patient's motor (Bervoets et al., 2014). Motor improvement can be trained with the independently healthy target stages of mindfulness therapy included in this study.

~~There are some limitations in this study. There are some limitations found in this study.~~ Firstly, the SI-DESI ~~has~~ lacks capacity, so this application ~~is unable to~~ ~~could not~~ contain ~~some~~ features such as video to guide the mindfulness steps. Secondly, this study has a small sample size and ~~was~~ only conducted in one psychiatric hospital ~~—~~ ~~thushence~~ a lack of generalizability of the study findings. Lastly, the post-test data collection was measured after the intervention and may not measure the impact ~~in the longer time.~~

Comment [tc7]: 'over a longer time'?

## Conclusions

This study showed that ~~that~~ mindfulness therapy through an android application SI-DESI is feasible and has an impact on ~~the~~ social interaction ~~inof~~ ~~peoplersons~~ with schizophrenia. This finding supports the positive effects of mindfulness therapy based mobile applications ~~ien~~ ~~peoplersons~~ with schizophrenia. This intervention is delivered by nurses in psychiatric hospitals. Hence, it is recommended for mental health professionals to implement this intervention to promote social interactions for persons with schizophrenia in practice. This study only examined the social interaction outcomes ~~at a one-point time.~~ ~~;~~ ~~if~~ further research is needed on developing and investigating other effects on the android application-based mindfulness therapy and follow-up measurement. ~~As~~ ~~Since the~~ mobile application in this study showed limited features, ~~hence~~ future research is needed to develop an application ~~that can~~ sufficient to all contents.

Comment [tc8]: 'one point of time'?

Comment [tc9]: Confusing sentence

Comment [tc10]: doesn't make sense

## Conflict of interests

The authors have no conflict of interests to declare.

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**Attachment**

**Table of Pre-Test Result**

No.	Patient	Group	Age	Gender	Education	Job	Medical Diagnosis	Result	Note
1.	Ar	I	31	Male	EE	HaJ	F20.3	33	lack of interaction
2.	Bgs	I	21	Male	EE	HaJ	F20.9	34	lack of interaction
3.	Ba	I	45	Male	HE	HaJ	F20.3	30	lack of interaction
4.	Dpw	NI	27	Female	ME	HaJ	F20.9	34	lack of interaction
5.	Ek	I	37	Female	ME	HaJ	F20.3	33	lack of interaction
6.	Fai	NI	41	Male	ME	HaJ	F20.3	30	lack of interaction
7.	H	I	31	Male	EE	HaJ	F20.9	32	lack of interaction
8.	I	I	46	Male	HE	Ue	F20.3	31	lack of interaction
9.	In	NI	33	Female	ME	Ue	F20.0	29	lack of interaction
10.	J	NI	46	Male	EE	HaJ	F20.9	31	lack of interaction
11.	Ksn	I	20	Male	ME	HaJ	F20.0	31	lack of interaction
12.	Kis	I	42	Male	EE	HaJ	F20.0	32	lack of interaction
13.	M	NI	20	Male	EE	Ue	F20.3	32	lack of interaction
14.	Mh	NI	20	Male	EE	Ue	F20.3	41	enough interaction
15.	MG	NI	20	Male	EE	Ue	F20.9	32	lack of interaction
16.	Mis	I	29	Female	ME	Ue	F20.3	31	lack of interaction
17.	Ms	NI	36	Male	HE	HaJ	F20.9	32	lack of interaction

18.	Mur	NI	41	Male	EE	HaJ	F20.9	32	lack of interaction
19.	N	NI	42	Male	EE	HaJ	F20.9	35	lack of interaction
20.	M	NI	33	Female	ME	Ue	F20.3	30	lack of interaction
21.	Nrpu	NI	19	Female	ME	HaJ	F20.0	32	lack of interaction
22.	Nw	I	22	Female	HE	HaJ	F20.3	32	lack of interaction
23.	A	I	27	Female	ME	Ue	F20.3	33	lack of interaction
24.	F	NI	34	Female	ME	Ue	F20.0	36	lack of interaction
25.	Nn	I	35	Female	ME	HaJ	F20.3	30	lack of interaction
26.	R	NI	40	Female	EE	HaJ	F20.3	32	lack of interaction
27.	RO	NI	40	Female	HE	HaJ	F20.3	30	lack of interaction
28.	S	I	58	Female	EE	Ue	F20.3	56	active interaction
29.	U	I	33	Female	ME	Ue	F20.0	33	lack of interaction
30.	Ut	NI	33	Female	ME	HaJ	F20.9	38	enough interaction
31.	Psm	I	47	Male	EE	Ue	F20.3	29	lack of interaction
32.	K	I	18	Male	ME	HaJ	F20.3	27	lack of interaction
33.	Ral	NI	51	Female	ME	HaJ	F20.3	36	lack of interaction
34.	Rsm	I	52	Male	EE	HaJ	F20.3	30	lack of interaction
35.	SE	I	31	Female	ME	Ue	F20.0	26	lack of interaction
36.	SK	NI	43	Female	ME	Ue	F20.0	26	lack of interaction
37.	Skom	NI	39	Female	ME	Ue	F20.3	28	lack of interaction
38.	SA	I	27	Male	ME	Ue	F20.0	26	lack of interaction
39.	Stmas	I	43	Female	ME	Ue	F20.3	39	enough interaction
40.	Stmuk	I	49	Female	EE	Ue	F20.3	33	lack of interaction
41.	Stnu	NI	18	Female	ME	Ue	F20.0	24	lack of interaction
42.	Sum	I	58	Female	ME	HaJ	F20.0	31	lack of interaction
43.	T	NI	51	Male	EE	HaJ	F20.0	37	enough interaction
44.	Ti	NI	37	Female	EE	Ue	F20.3	33	lack of interaction
45.	BM	I	20	Male	ME	Ue	F20.9	56	active interaction
46.	C	I	27	Male	HE	Ue	F20.3	32	lack of interaction
47.	DS	NI	45	Male	EE	HaJ	F20.9	26	lack of interaction
48.	UF	I	40	Male	ME	HaJ	F20.1	38	enough interaction
49.	W	I	39	Male	ME	HaJ	F20.9	28	lack of interaction
50.	Wah	NI	28	Male	ME	HaJ	F20.3	31	lack of interaction
51.	Yd	NI	48	Male	HE	HaJ	F20.3	31	lack of interaction
52.	Yl	I	30	Male	ME	HaJ	F20.3	34	lack of interaction

Note: Patient name use initial for legal ethic; I, intervention; NI, non intervention; EE, early education; ME, middle education; HE, higher education; HaJ, Have a job; Ue, unemployed; F20.0, schizophrenia paranoid; F20.3, schizophrenia undifferentiated; F20.9, schizophrenia unspecified

Comment [tc11]: doesn't make sense

### Table of Post-Test Result

No.	Patient	Group	Age	Gender	Education	Job	Medical Diagnosise	Result	Note
1.	Ar	I	31	Male	EE	HaJ	F20.3	65	active interaction
2.	Bgs	I	21	Male	EE	HaJ	F20.9	66	active interaction
3.	Ba	I	45	Male	HE	HaJ	F20.3	64	active interaction
4.	Dpw	NI	27	Female	ME	HaJ	F20.9	33	lack of interaction
5.	Ek	I	37	Female	ME	HaJ	F20.3	61	active interaction
6.	Fai	NI	41	Male	ME	HaJ	F20.3	30	lack of interaction
7.	H	I	31	Male	EE	HaJ	F20.9	61	active interaction
8.	I	I	46	Male	HE	Ue	F20.3	57	active interaction
9.	In	NI	33	Female	ME	Ue	F20.0	27	lack of interaction
10.	J	NI	46	Male	EE	HaJ	F20.9	31	lack of interaction
11.	Ksn	I	20	Male	ME	HaJ	F20.0	64	active interaction
12.	Kis	I	42	Male	EE	HaJ	F20.0	62	active interaction
13.	M	NI	20	Male	EE	Ue	F20.3	33	lack of interaction
14.	Mh	NI	20	Male	EE	Ue	F20.3	43	enough interaction
15.	MG	NI	20	Male	EE	Ue	F20.9	36	lack of interaction
16.	Mis	I	29	Female	ME	Ue	F20.3	59	active interaction
17.	Ms	NI	36	Male	HE	HaJ	F20.9	32	lack of interaction
18.	Mur	NI	41	Male	EE	HaJ	F20.9	33	lack of interaction
19.	N	NI	42	Male	EE	HaJ	F20.9	33	lack of interaction
20.	M	NI	33	Female	ME	Ue	F20.3	31	lack of interaction
21.	Nrpu	NI	19	Female	ME	HaJ	F20.0	30	lack of interaction
22.	Nw	I	22	Female	HE	HaJ	F20.3	60	active interaction
23.	A	I	27	Female	ME	Ue	F20.3	60	active interaction
24.	F	NI	34	Female	ME	Ue	F20.0	35	lack of interaction
25.	Nn	I	35	Female	ME	HaJ	F20.3	61	active interaction
26.	R	NI	40	Female	EE	HaJ	F20.3	30	lack of interaction
27.	RO	NI	40	Female	HE	HaJ	F20.3	30	lack of interaction
28.	S	I	58	Female	EE	Ue	F20.3	62	active interaction
29.	U	I	33	Female	ME	Ue	F20.0	60	active interaction
30.	Ut	NI	33	Female	ME	HaJ	F20.9	35	lack of interaction
31.	Psm	I	47	Male	EE	Ue	F20.3	59	active interaction
32.	K	I	18	Male	ME	HaJ	F20.3	57	active interaction
33.	Ral	NI	51	Female	ME	HaJ	F20.3	37	enough interaction
34.	Rsm	I	52	Male	EE	HaJ	F20.3	58	active interaction
35.	SE	I	31	Female	ME	Ue	F20.0	60	active interaction
36.	SK	NI	43	Female	ME	Ue	F20.0	28	lack of interaction
37.	Skom	NI	39	Female	ME	Ue	F20.3	28	lack of interaction
38.	SA	I	27	Male	ME	Ue	F20.0	57	active interaction
39.	Stmas	I	43	Female	ME	Ue	F20.3	41	enough interaction
40.	Stmuk	I	49	Female	EE	Ue	F20.3	59	active interaction

41.	Stnu	NI	18	Female	ME	Ue	F20.0	26	lack of interaction
42.	Sum	I	58	Female	ME	HaJ	F20.0	62	active interaction
43.	T	NI	51	Male	EE	HaJ	F20.0	37	enough interaction
44.	Ti	NI	37	Female	EE	Ue	F20.3	33	lack of interaction
45.	BM	I	20	Male	ME	Ue	F20.9	63	active interaction
46.	C	I	27	Male	HE	Ue	F20.3	62	active interaction
47.	DS	NI	45	Male	EE	HaJ	F20.9	26	lack of interaction
48.	UF	I	40	Male	ME	HaJ	F20.1	51	enough interaction
49.	W	I	39	Male	ME	HaJ	F20.9	62	active interaction
50.	Wah	NI	28	Male	ME	HaJ	F20.3	31	lack of interaction
51.	Yd	NI	48	Male	HE	HaJ	F20.3	29	lack of interaction
52.	Yl	I	30	Male	ME	HaJ	F20.3	60	active interaction

Note: Patient name use initial for legal ethic; I, intervention; NI, non intervention; EE, early education; ME, middle education; HE, higher education; HaJ, Have a job; Ue, unemployed; F20.0, schizophrenia paranoid; F20.3, schizophrenia undifferentiated; F20.9, schizophrenia unspecified

Comment [tc12]: doesn't make sense



# MOBILE APPLICATIONS FOR MINDFULNESS IN SOCIAL INTERACTION OF PERSONS WITH SCHIZOPHRENIA

## Recenze verze 1

### Recenze č. 1: Uveřejnit s drobnými opravami

In the article has grammatical and formal errors, incomplete sentences or sentences that are not stylistically correct

Odpovídá profilu a zaměření časopisu? <i>ano</i>	Vědecká hodnota: <i>dobrá</i>
Originalita: <i>dobrá</i>	Prezentace materiálů, metod a údajů je: <i>přiměřená</i>
Diskuse a závěr jsou: <i>přiměřené</i>	Jasně rozlišeny výsledky, diskuse, závěry? <i>ano</i>
Vycházejí závěry skutečně z uvedených údajů? <i>ano</i>	Kvalita jazykového projevu: <i>dobrá</i>
Lze rukopis zkrátit? <i>ne</i>	Je souhrn odpovídající a informativní? <i>ano</i>
Tabulky jsou: <i>dostačující a dobře prezentovány</i>	Obrázky a grafy jsou: <i>dostačující a dobře prezentovány</i>
Vzorce jsou: <i>dostačující a vhodně uváděny</i>	Odkazy na literaturu: <i>přiměřené a správně uváděny</i>

### Recenze č. 2: Uveřejnit po přepracování

The present article is very timely, and is an example of progress in healthcare, and how modern technology can help. Individual chapters are appropriately divided, the authors work with current foreign literature, the conclusions of the work are supported by quality data. I would recommend the authors of the article to reduce the number of tables and to mention only the most important ones. There are also grammatical and formal errors, incomplete sentences or sentences that are not stylistically correct; this could have been caused by inconsistent scrutiny of the English text.

Odpovídá profilu a zaměření časopisu? <i>ano</i>	Vědecká hodnota: <i>dobrá</i>
Originalita: <i>dobrá</i>	Prezentace materiálů, metod a údajů je: <i>přiměřená</i>
Diskuse a závěr jsou: <i>přiměřené</i>	Jasně rozlišeny výsledky, diskuse, závěry? <i>ano</i>
Vycházejí závěry skutečně z uvedených údajů? <i>ano</i>	Kvalita jazykového projevu: <i>dobrá</i>
Lze rukopis zkrátit? <i>ne</i>	Je souhrn odpovídající a informativní? <i>ano</i>
Tabulky jsou: <i>nelze hodnotit</i>	Obrázky a grafy jsou: <i>je jich příliš mnoho</i>
Vzorce jsou: <i>nelze hodnotit</i>	Odkazy na literaturu: <i>přiměřené a správně uváděny</i>



## MOBILE APPLICATIONS FOR MINDFULNESS IN SOCIAL INTERACTION OF PERSONS WITH SCHIZOPHRENIA

### Recenze verze 2

#### Recenze č. 1: Uveřejnit bez úprav

The authors of the article incorporated comments, reduced the number of tables and graphs, and corrected typos, stylistic errors and other comments. The article is in accordance with the guidelines for authors and brings knowledge in the field of psychiatric nursing care, which are in line with modern trends in this field, discussion is readable and clearly structured, the conclusion describes the main achieved results and includes recommendations for clinical practice, the sources used are up-to-date and come from database sources.

Odpovídá profilu a zaměření časopisu? <i>ano</i>	Vědecká hodnota: <i>vynikající</i>
Originalita: <i>vynikající</i>	Prezentace materiálů, metod a údajů je: <i>přiměřená</i>
Diskuse a závěr jsou: <i>přiměřené</i>	Jasně rozlišeny výsledky, diskuse, závěry? <i>ano</i>
Vycházejí závěry skutečně z uvedených údajů? <i>ano</i>	Kvalita jazykového projevu: <i>dobrá</i>
Lze rukopis zkrátit? <i>ne</i>	Je souhrn odpovídající a informativní? <i>ano</i>
Tabulky jsou: <i>dostačující a dobře prezentovány</i>	Obrázky a grafy jsou: <i>dostačující a dobře prezentovány</i>
Vzorce jsou: <i>dostačující a vhodně uváděny</i>	Odkazy na literaturu: <i>přiměřené a správně uváděny</i>