

Exploration of Active Smartphone User's Mental Health and the Opportunities of an Internet-Based Therapy Approach.

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The internet is the latest technology developed in various sectors of life. This technology provides its users with ease of access, simplicity, huge data storage, connectivity, amongst other conveniences. One implication of this technological development is implemented through the use of a smartphone. This device brings a major change in daily life and human social complexity. Indonesia, as a developing country, has the largest smartphone use potential in Asia. However, excessive use raises new mental health issues for individuals. The intervention of mental health services in Indonesia has not been able to reach all clients. Additionally, the use of internet-based services are unknown and not yet measurable through various researches. This study aims to explore the mental health condition of active users of smartphones in Indonesia and internet-based usage opportunities for its services. This preliminary study consisted of 174 respondents spread throughout Indonesia with diverse demographics. The data findings were analysed by using network psychometrics and Rasch analysis. The results showed that, in general, some mental health disorder was found among users who actively use smartphone related to social conditions. The opportunity to use internet technologies to reach individuals with disturbed mental health conditions are significant. Respondents want internet-based services to be provided before meeting counsellors and psychotherapists personally.

Keywords: *Smartphone technology, mental health services, internet-based therapy.*

Introduction

The development of internet usage from year to year is growing rapidly. Based on data from Hootsuite (We are Social), which released an update on digital statistical data and internet users in the world in 2019 Second Quarter (Q2), a total of 4.437 billion internet users out of 7.697

billion total population (We Are Social & Hootsuite, 2019). The rapid development of the internet in the world is encouraging various disciplines to integrate this technology into various scientific methods and approaches. Different scientific disciplines have also utilised this opportunity in the social science field. The creativity and breakthrough of various experts in the field of social science seeks to investigate how internet technology can change social dynamics (Andersson, 2015; Baumeister, Reichler, Munzinger, & Lin, 2014; Kraut et al., 2002). One of them is by utilizing the internet in mental health (Hind & Sibbald, 2015; Kenny, Dooley, & Fitzgerald, 2014).

One of the mainstream internet technologies used in various fields of the science discipline is mobile technology in the form of smartphones. The emergence of various smartphone applications is proven to improve the performance and effectiveness of an activity (Lackey & Appell, 2018; Bakker, et al., 2016; Tangmunkongvorakul et al., 2019). Smartphone applications are assumed to be ideal as a tool in providing ongoing mental health interventions to individuals who are enrolled in community support programs because the use of smartphones eliminates stigma and customized applications can offer frequent social support via text messages (Batterham & Calear, 2017; Stawarz, Preist, & Coyle, 2018; Macias et al., 2015). Several studies have shown an increased interest in technology-based interventions over the past decade with the focus gradually shifting from computer-based to internet-based and ultimately to smartphone-based interventions. This is because technology affects more human lives and is easy to use (Ly, Dahl, Carlbring, & Andersson, 2012; Nolen, Giblin-Scanlon, Boyd, & Rainchuso, 2018). Based on the 2018 APJII survey, Indonesian people preferred to connect to the internet via smartphones with a percentage of 93.9% (APJII, 2018). This certainly indicates that mental health interventions through smartphones will be very helpful if implemented in Indonesian society.

Statistical findings from relevant health institutions demonstrate opportunities for the use of smartphone technology in the context of mental health service interventions. In Indonesia, the 2013 Basic Health Research (Riskesdas) data, combined with Routine Data from Pusdatin with time adjusted shows that the prevalence of mental-emotional disorders indicated by symptoms of depression and anxiety equates to 6% for ages 15 years and over, or approximately 14 million people. The prevalence of severe mental disorders, such as schizophrenia, is 1.7 per 1,000 population or about 400,000 people (Ministry of Health, 2013; 2018). Based on this data, the community's need for mental health assistance is quite high. The number handled by professionals in Indonesia is, with a population of around 250 million people, only has about 451 clinical psychologists (0.15 per 100,000 people), 773 psychiatrists (0, 32 per 100,000 people), and mental care 6,500 people (2 per 100,000 people). While the WHO set the standard number of psychologists and psychiatrists with a population of 1:30 thousand people, or 0.03 per 100,000 people (Matta, 2016).

The prevalence of mental health disorders shows inequality with the availability of professionals who can provide services. This is an important indication of the emergence of mental health problems that can have a systemic and widespread impact in Indonesia. The gap between the needs of health services and the availability of professionals has opened opportunities and demanded creativity from professional mental health service providers, one effective step that can be taken is to develop mental health applications based on smartphone technology.

The growth of various applications related to the search for health information on smartphones in recent years has been growing (Mandiri, 2016; Purnomo, 2016; Tawakal, 2015). Overseas, applications for mental health have been widely used (Deb et al., 2018; Hind & Sibbald, 2015; Kenny et al., 2014). Mental health applications (MHApps) have been used for psychosis, bipolar disorder, depression, suicide, anxiety, eating disorders, and drug use as well as to improve aid services and monitor program outcomes in psychiatry (Ben-Zeev et al., 2016; Firth et al., 2017; Torous, Firth, Mueller, Onnela, & Baker, 2017).

The existence of health interventions through smartphones is assumed to provide opportunities for the provision of internet-based services to handle the health conditions of smartphone users (Barnes, Pressey, & Scornavacca, 2019). This research will investigate the mental health conditions of active smartphone users to view and map the general conditions and potential that can arise. In addition, this research will examine the correlation of mental health conditions with the desire to use the internet as a service facility and study and predict opportunities for the use of mental health services with internet-based for Indonesia's population in the future.

Methods

Participant

This study involved 174 respondents spread throughout Indonesia to determine the conditions of acceptance and testing of the product. Samples come from dynamic and diverse demographics. The demographics of the sample are grouped by gender, age, occupation, marital status, and domicile. Random sample display resulted in a dominance of a female example of 73.56% and a male of 25.86%, with the largest age range being at 18 to 24 years. The demographic conditions of the first sample are detailed in Table 1.

Approval in the collection of data on the sample is carried out just before the example fills in the instrument and uses the product through an agreement sheet. To test the validity and quality of the product being developed, the next sample was taken from ten licensed counselling experts as well as counsellors. Sampling for validation of the product uses purposive sampling with the criteria of counsellors who have been practicing counselling for more than five years and have prior distance counselling experience.

Table 1. Sample Demography

	Duration of smartphone usage			
	Less than 3 hours	3 - 5 hours	6 - 10 hours	More than 10 hours
Gender				
Man	7 (4.02%)	22 (12.64%)	13 (7.47%)	3 (1.72%)
Woman	20 (11.49%)	41 (23.56%)	50 (28.74%)	18 (10.34%)
Age				
Under 18	0 (0.00%)	1 (0.57%)	0 (0.00%)	0 (0.00%)
18-24	10 (5.75%)	41 (23.56%)	50 (28.74%)	17 (9.77%)
25-34	5 (2.87%)	16 (9.20%)	9 (5.17%)	2 (1.15%)
35-44	3 (1.72%)	4 (2.30%)	4 (2.30%)	2 (1.15%)
45-54	3 (1.72%)	1 (0.57%)	0 (0.00%)	0 (0.00%)
Over 55	6 (3.45%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Marital Status				
Married	16 (9.20%)	12 (6.90%)	12 (6.90%)	2 (1.15%)
Single	11 (6.32%)	51 (29.31%)	51 (29.31%)	19 (10.92%)
Domicile				
City	22 (12.64%)	47 (27.01%)	54 (31.03%)	18 (10.34%)
Suburbs	4 (2.30%)	9 (5.17%)	4 (2.30%)	2 (1.15%)
Rural areas	1 (0.57%)	7 (4.02%)	5 (2.87%)	1 (0.57%)

The first sample size of 174 people was based on the measurement of the sample power to avoid α and β errors. Based on measures taken, the minimum number of samples with actual power is 0.95, and the effect size is 0.82 in 95 respondents. With the number of samples in this study, the strength of the sample and the resulting statistical power meet the minimum requirements.

Measurement

This study reveals two main aspects that are mental health conditions and conditions of respondents' acceptability of mental health services based on mobile-app. Mental health is measured using the Mental Health Inventory (MHI) (Al Mutair et al., 2018), which has been translated and adapted into Indonesian in a shortened version and has a Cronbach Alpha-KR20 value of 0.93. Measurements of respondents' acceptability of mental health services using mobile app were measured using inventory sourced from Consumer Mobile Health (mHealth) Usage (Rai, Chen, Pye, & Baird, 2013) and have been modified with an approach to mental health, and resulted in an Acceptability of Mental-Health Mobile-App Survey (AMMS) with Cronbach Alpha-KR20 value of 0.89.

Data Analysis

To determine the achievements of the sample in the form of demographics, the meanings were carried out using descriptive statistical analysis. Meanwhile, to see respondents' acceptance of internet-based mental health service technology, testing is conducted using Rasch Model

analysis. This analysis procedure is carried out with the assumption that the Rasch analysis will accurately describe the achievements of respondents with lower error rates. The Rasch analysis was performed using Winstep 3.72 Software.

Results and Discussion

Demography

Based on demographic data in Table 1, it is known that the duration of smartphone use in women is higher than that of men, it is seen that the percentage of smartphone use duration in men is 12.64%, with an allocation of time 3-5 hours/day, while the percentage smartphone usage in women is 28.74%, with an allocation of time of 6-10 hours/day. Based on age, the most percentage of smartphone usage duration is in the age range of 18-24 years with an allocation of usage time of 6-10 hours/day. Furthermore, the duration of smartphone use for unmarried people tends to be longer, which is 6-10 hours/day, with a percentage of 29.31%. Regarding the duration of smartphone use based on domicile origin, it is known that people who live in cities longer use smartphones, namely with an allocation of time from 6-10 hours/day.

Mental Health Conditions

Estimation	Logit Value	Rescaling Logit Value (0-100)
	MHI	MHI
Mean Person	.77	48.63
SD Person	1.49	8.77
Max Measure	4.84	72.59
Min Measure	-3.84	21.56
Separation Index Person	3.37	-
Person Reliability (Cronbach Alpha-KR20)	.93	-

The Rasch model analysis was carried out to determine the mental health condition of the respondents. Based on Table 2, it is known that the rescaling of mental health logit values shows a value of 48.63 from 100 scales, this indicates that the mental health condition of the respondents is approaching the mid-scale or is at a moderate level.

General Conditions of Acceptance of Mental Health Services Interventions

The results of the analysis of the general condition of the acceptance of the intervention of the mental health services of respondents showed rescaling the logit value of 49.49 out of 100 in Table 3.

Estimation	Logit Value	Rescaling Logit Value (0-100)
	AMMS	AMMS
Mean Person	.09	49.49
SD Person	1.61	12.34
Max Measure	5.36	90.03
Min Measure	-4.27	15.99
Separation Index Person	2.50	-
Person Reliability (Cronbach Alpha-KR20)		.89

This condition shows that there is a strong trend in respondents in receiving mental health services using a mobile application. This condition strengthens the opportunity for future use of technology to provide mental health interventions and quality of life (well-being), such as stress management, anxiety, career exploration, and others.

Correlation of Mental Health with the Desire to Use Services via Online

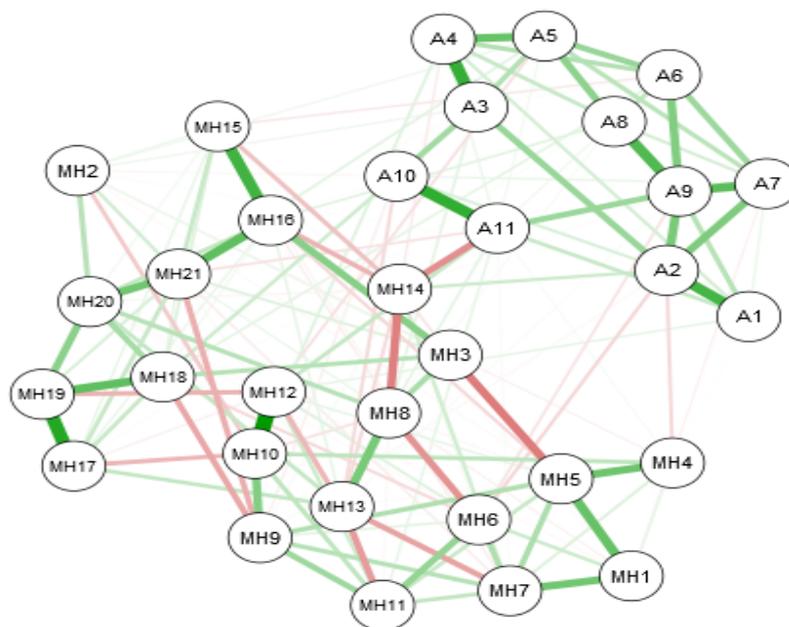


Figure 1. The network model structure of interaction between the mental health condition and acceptability intervention using internet-based mobile-app



The green line in Figure 1 shows that there is a positive partial correlation, and the red line shows the average negative partial correlation (Epskamp, Cramer, Waldorp, Schmittmann, & Borsboom, 2012; Epskamp, Maris, Waldorp, & Borsboom, 2016). Items that have a strong positive correlation are items MH10 with MH12, MH17 with MH19, MH15 with MH16, A10 with A11, A4 with A3, A2 with A1, A8 with A9. While items that have a partial negative correlation are items MH8 with MH14, MH3 with MH5, MH14 with A11.

Conclusion

Based on the result from the study, we affirm that (1) Duration smartphone usage experienced by women more than men, while based on age range, is mostly dominated by ages 18-24 years, based on marital status is dominated by single, and based on domicile is dominated mainly by urban society. (2) Generally, mental health condition is at a moderate level. (3) Respondents usually have a positive response to mobile-app presence as a mental health service medium. (4) The network model has also seen a strong interaction between the mental health condition and the acceptability of this media as an intermediary.

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