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The analysis of mental health awareness constructs in college students during the Covid-19 pandemic based on Rasch Model application

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Abstract
Mental health awareness is a condition when individuals are aware of the importance of mental health in maintaining their positive psychological well-being. Awareness involves prevention of mental problems, identifying mental problems, and self-managing in any possibilities of mental distuption. A way to maintain mental health awareness is to obtain knowledge or information related to disorders, management, and prevention of mental health problems through literacy. Meanwhile, Lack of mental health literacy have been identified as major obstacles for the promotion of mental health and early intervention during this pandemic era. This study aims to develop a measuring instrument by testing the validity and reliability of mental health awareness through literacy during the COVID-19 pandemic towards college students using the Rasch Model approach. The subjects of this study were male and female, college students aged 18 – 25 years and Indonesian citizens. This research was conducted on 307 subjects. The results of the research showed that the mental health awareness scale using Mental Health Literacy Questionnaire is a reliable and valid measuring instrument (α = 0.844) during the COVID-19 pandemic by using the Rasch Model approach and compared to the classical theory of mental health awareness. There are 21 valid items and 8 removed items with no any dimensions are eliminated.

Keywords: college students in COVID-19 pandemic, mental health awareness

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Introduction

Governments around the world have taken decisive action to suppress the spread of Coronavirus Disease 2019, known as COVID-19, was done after World Health Organization announced that the COVID-19 disease outbreak as a global pandemic (Hermans, Broucke, Gisle, Demarest, & Charafeddine, 2021). The COVID-19 pandemic is accompanied by a storm of complex information "infodemic", there is a lot of misinformation and hoaxes (WHO, 2020). Challenges found by Patil et al (2021) is that many sources of health information are inconsistent and tend to be misleading during this pandemic. This situation makes the community tend to be disobedient in implementing the health protocols. Public disobedience can also be caused by inadequate communication strategies and inability to obtain related information. Hance, the public have to realize the importance of health literacy in this issue (Hermans, Broucke, Gisle, Demarest, & Charafeddine, 2021). Health literacy during this period needs special attention throughout the scope of information, from planning to evaluating communication. Low comprehension about health-related information makes professionals responsible for helping the public to access correct information (Damian & Gallo, 2020). Currently, guidelines for the format of news distribution related to COVID-19 are needed. The development of guidelines is essential because information related to the pandemic is still changing frequently. That makes the cycle of rumors or fake news continue to spread and may cause distress, anxiety, and bring up other psychological factors (Sharma et al, 2020). If these conditions persist in the individual in the long-term period, there may be

an significant impact on the quality of the individual's mental health quality (Setyaningrum & Yanuarita, 2020).

Regarding the scope of mental health, relevant information sources can influence a person's attitudes, beliefs, and behavior are leading to low mental health awareness in the community (Devendorf, Bender, & Rottenberg, 2020). Mental health awareness is a form in which individuals are aware of the importance of mental health that has a significant role in maintaining the positive psychological well-being of individuals. Awareness of this involves preventing mental problems, identifying, handling, and managing yourself if there is mental illness unashamedly (Ravichandran et al., 2017). Mental health awareness in this study is applied in mental health literacy's aspect. Mental health literacy can be defined as knowledge and beliefs regarding mental disorders related to recognition, management, and prevention. Therefore, the awareness about mental health is not only about understanding, but also having the beliefs to build positive attitudes about the importance of healthy mental qualities. Individuals who have a good level of mental health literacy include having knowledge about mental problems, avoiding misconceptions and stereotypes, having first aid skills or seeking help behavior, and having self-help strategies in dealing with mental problems so that the current state becomes healthier (Dias et al., 2018).

In this pandemic era, many demands disrupt people's mental health and impact their emotional burdens (Fitri, 2019). That is not in accordance with the national-scale prevention plans that have been focused on prevention, detection, repression, and treatment (Dadaczynski et al., 2021). Mental health requires a special attention because the prevalence of mental disorders in Indonesia is quite large, it is about 2 out of 1,000 populations. The vulnerable age range for young adults ranges from (15-24 years) in which there is a college students age range (Fitri, 2019). Previous research estimates that 39% of college students have mental health-related problems (Beasley, Kiser, & Hoffman, 2020). A survey conducted by Indonesian Psychiatric Association explained that 63% of respondents have experienced anxiety, meanwhile 66% have experienced depression due to the COVID-19 pandemic (Ridlo, 2020).

Mental Health Literacy (MHL) is an essential factor in pandemic health control (Broucke, 2020). Individuals with low MHL are found difficult in defining a mental disorder, unable to identify risk factors, and unable to recognize symptoms (Lee et al., 2020). Therefore, MHL is a concept related to knowledge about the effective management strategies, against mental health stigmas, as well as awareness and ability to practice psychological first aid in order to help others (Gorczynski et al., 2020). One of the ways to improve mental health is increasing literacy activities related to mental health. This method can increase self-efficacy (Beasley, Kiser, & Hoffman, 2020). Having sufficient information on mental health will also improve more positive mental health (Lee et al., 2020). Therefore, this research focuses mainly on the construction of a measuring tool to assess the quality of mental health awareness in students during the covid-19 pandemic using a mental health literacy measurement tool. This research is considered by the phenomenon based on literature review which shows that mental health awareness has not become a major concern among the public. Therefore, there is no yet valid Indonesian version of the measuring instrument that can be used in general communities.

This research is also expected to be functional for policymakers, health professionals, university administrations, and libraries to promote the prevention of various impacts caused by COVID-19 (Shaukat, Asghar, & Naveed, 2021). College staffs also need sufficient literacy related to mental health since students need facilitators who can understand their mental health condition (Gulliver, Farrer, Bennett, & Griffiths, 2017). Another benefit is to plan literacy programs that promote preventive and protective information (Shaukat, Asghar, & Naveed, 2021). This research can be used as the basis for planning MHL interventions. Research related to MHL has been done quite a lot in various populations and should have a practical benefit. Further research is suggested to focus on changing behavior and improving mental health (Jorm, 2020).

Method

Participants

The population for this study were active bachelor degree students in all of the universities in Indonesia and stated as Indonesia citizens. The research subjects consisted of 307 college students (90 are male and 217 are female). The random sampling process was carried out by distributing questionnaires via a Google Form.

Measurement

Mental health awareness is measured by using a mental health literacy measuring tool through a modification and adaptation of Mental Health Literacy Questionnaire for Young Adult (MHLq-YA), formulated by Dias et al. (2018). MHLq young adult is composed of 29 items organized in a 5-point Likert response scale: 1 = "strongly disagree"; 2 = "disagree"; 3 = "neither agree nor disagree"; 4 = "agree"; and 5 = "strongly

agree". This measuring instrument is tested for the Alpha coefficient to college students with an alpha coefficient of 0.844. Four aspects are revealed in revealing mental health literacy such as knowledge of mental health problems, Erroneous beliefs/stereotypes, First aid skills/help-seeking behavior, and Self - help strategies. Each indicator has a different distribution of the number of items so that the total number is 29 items.

Data Analysis

Aitem analysis in this research based on Rasch model. One of the requirements in the Rasch model analysis is that the scale is unidimensional (Vindbjerg, Carlsson, Mortensen, Makransky, & Nielsen, 2020), and this study has four dimensions, that is knowledge of mental health problems, the erroneous beliefs/stereotypes, first aid skills/help-seeking behavior, Self-help strategies. The analytical technique also used in this study is Confirmatory Factor Analysis (CFA) using the Structural Equation Modeling (SEM) technique. The software used for data analysis is AMOS.

Results and Discussion

First, data cleaning has been carried out to ensure that each participant who takes part in the study has complied with the criteria required in this study. Of the 321 questionnaires entered, this research can only use 277 data. The remaining 44 could not be used because 42 students had not returned the informed consent of their parents/guardians, one person was a student of SMK, and one person was an 11th-grade of SMA. Based on 277 data that could be used, the age range of the participants ranged from 15 to 20 years (M=17.05, SD= 0.606). Most of the participants were female, reaching 78.3% of the participants in this study. Most participants came from the island of Java, which was 66.79%. From the type of school, most of the participants are from public high schools (68.6%). Science majors dominated participants as much as 67.9%.

Table 1. Matrix Block 1 Design

	Design Matrix Block 1:				
	Location	Threshold 1	Threshold 2	Threshold 3	Threshold 4
i1	**-0.262**	**-0.741**	**-0.614**	**0.568**	**NA**
i2	0.022	-0.311	0.425	-0.609	0.582
i3	0.084	0.518	-1.575	0.013	1.382
i4	0.667	0.176	0.300	1.087	1.107
i5	-0.303	0.095	-1.979	-0.105	0.779
i6	1.865	1.326	2.588	1.909	1.635
i7	**-0.498**	**-1.331**	**-0.752**	**0.589**	**NA**
i8	0.198	0.519	-0.864	0.274	0.862
i9	-0.084	1.869	-1.533	-1.275	0.604
i10	0.405	1.101	-0.188	0.317	0.389
i11	**-0.498**	**-1.331**	**-0.752**	**0.589**	**NA**
i12	0.532	-0.840	-0.118	1.630	1.455
i13	0.482	0.614	0.750	-0.360	0.925
i14	-0.419	0.068	-0.941	-0.791	-0.012
i15	0.319	0.890	0.039	-0.182	0.527
i16	0.035	-0.433	-1.304	0.364	1.513
i17	**-0.117**	**-1.115**	**-0.045**	**0.809**	**NA**
i18	0.803	0.087	0.072	0.726	2.327
i19	-0.151	-1.383	-1.140	0.550	1.369
i20	-0.232	-0.996	-1.045	-0.064	1.177
i21	0.632	0.301	0.249	0.201	1.777
i22	-0.161	-1.138	-1.127	0.117	1.505
i23	0.679	0.121	0.161	1.074	1.360
i24	0.287	0.126	-0.421	-0.001	1.444
i25	-0.140	-1.004	0.595	-0.907	0.757
i26	-0.373	0.075	-0.393	-1.715	0.540
i27	0.291	0.494	-1.534	0.755	1.451
i28	0.429	-0.135	-0.724	0.733	1.840
i29	0.274	0.199	-0.486	0.400	0.984

The table above is the item location and item threshold for each answer choice, where item location is the level of difficulty of an item, while the threshold is the location of the deviation between answer choices. The

choice answer items that not chosen by the respondents are items 1, 7, 11, and 17. That is because in items no. 1, 7, 11, and 17 in answer choice 1 (strongly disagree), there are no respondents who choose, so the choice does not work. Therefore, it is recommended to use four range answer choices instead of five options those items.

Table 2. Item fit statistic

Item fit Statistics:								
	Chisq	df	p-value	Outfit MSQ	Infit MSQ	Outfit t	Infit t	Discrim
i1	280.201	305	0.843	0.916	0.957	-0.784	-0.402	0.319
i2	390.336	305	0.001	1.276	0.996	2.035	0.002	0.265
i3	249.216	305	0.991	0.814	0.821	-2.049	-1.879	0.535
i4	396.182	305	0.000	1.295	1.132	3.450	1.799	0.288
i5	244.714	305	0.995	0.800	0.804	-2.181	-2.151	0.601
i6	644.163	305	0.000	2.105	1.833	7.575	7.152	-0.150
i7	259.068	305	0.973	0.847	0.897	-1.590	-1.087	0.429
i8	255.559	305	0.982	0.835	0.850	-1.657	-1.575	0.520
i9	277.076	305	0.873	0.905	0.851	-0.651	-0.960	0.449
i10	650.751	305	0.000	2.127	1.295	7.015	2.868	0.018
i11	255.541	305	0.982	0.835	0.860	-1.720	-1.518	0.488
i12	321.828	305	0.243	1.052	1.037	0.722	0.531	0.335
i13	465.703	305	0.000	1.522	1.088	4.053	0.979	0.255
i14	228.255	305	1.000	0.746	0.813	-1.788	-1.267	0.497
i15	477.089	305	0.000	1.559	1.070	3.763	0.677	0.218
i16	256.561	305	0.980	0.838	0.848	-2.022	-1.863	0.508
i17	227.690	305	1.000	0.744	0.778	-3.122	-2.894	0.643
i18	342.395	305	0.069	1.119	1.008	1.439	0.127	0.347
i19	277.520	305	0.869	0.907	0.910	-1.226	-1.197	0.436
i20	258.937	305	0.974	0.846	0.863	-1.777	-1.566	0.489
i21	453.299	305	0.000	1.481	1.221	4.742	2.518	0.108
i22	265.683	305	0.949	0.868	0.829	-1.626	-2.125	0.539
i23	397.405	305	0.000	1.299	1.192	3.569	2.517	0.198
i24	321.889	305	0.242	1.052	0.940	0.555	-0.600	0.387
i25	272.988	305	0.906	0.892	0.878	-0.889	-1.076	0.428
i26	235.376	305	0.999	0.769	0.836	-1.885	-1.161	0.486
i27	290.128	305	0.721	0.948	0.901	-0.599	-1.157	0.440
i28	309.856	305	0.412	1.013	0.959	0.179	-0.460	0.377
i29	240.216	305	0.998	0.785	0.790	-2.373	-2.468	0.593

The table above is the result item fit analysis using the Partial Credit Model (PCM) approach. The criteria used are chi-square with a p-value > 0.05. If the p-value is not significant, then the item fits the model. The results show several items that do not fit the model, i.e. items number 2, 4, 6, 10, 13, 15, 21, and 23.

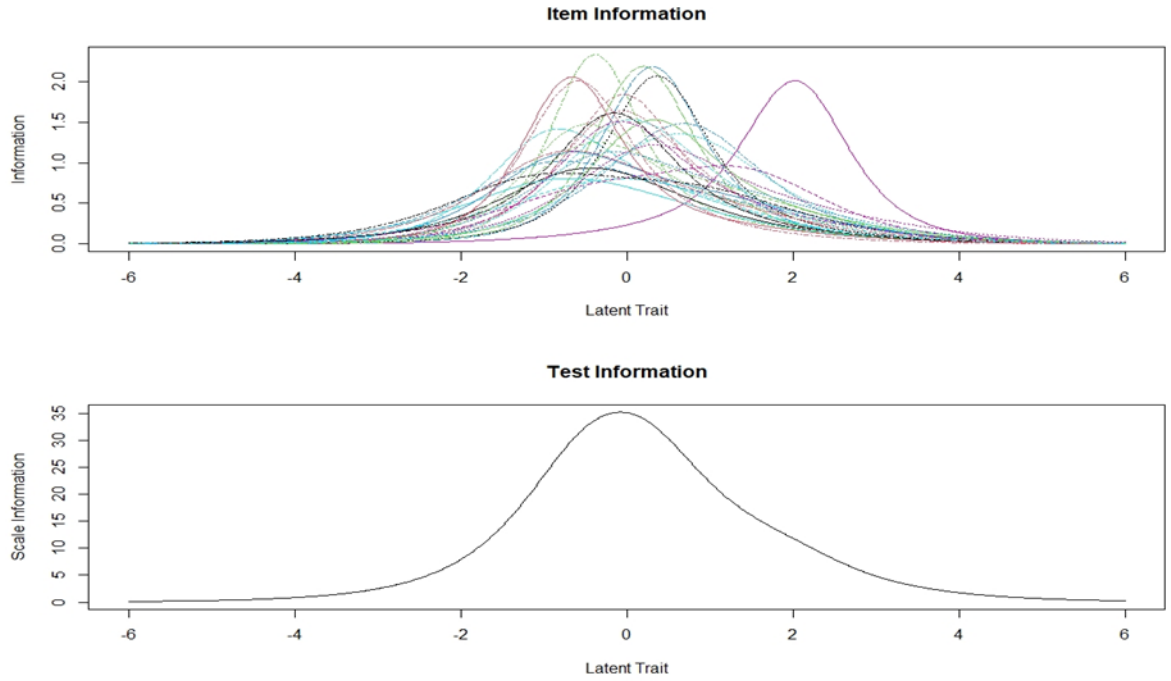
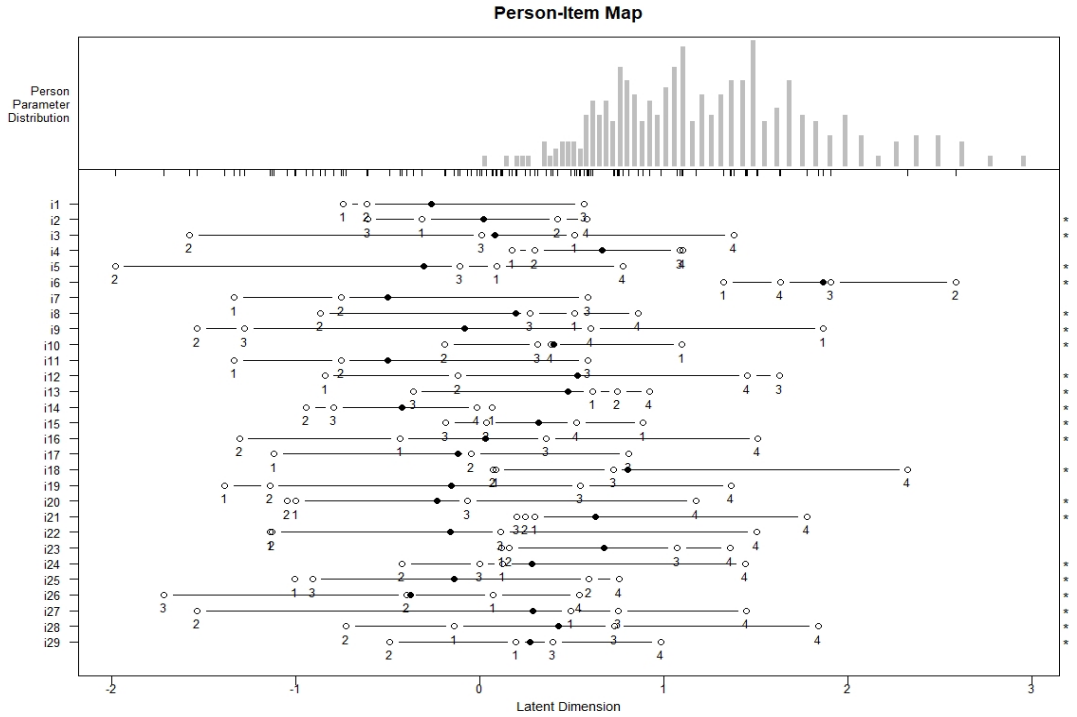


Figure 1. Test Information

Overall, the higher and steeper the curve, the greater information obtained from the item, while the lower and sloping curve is less. The item measures a wide range of abilities. Next is the test information plot that describes the overall item information. The test tool is more suitable for measuring ability or latent trait zero ($\theta = 0$). Thus, the measuring instrument is more likely to measure people with intermediate abilities.



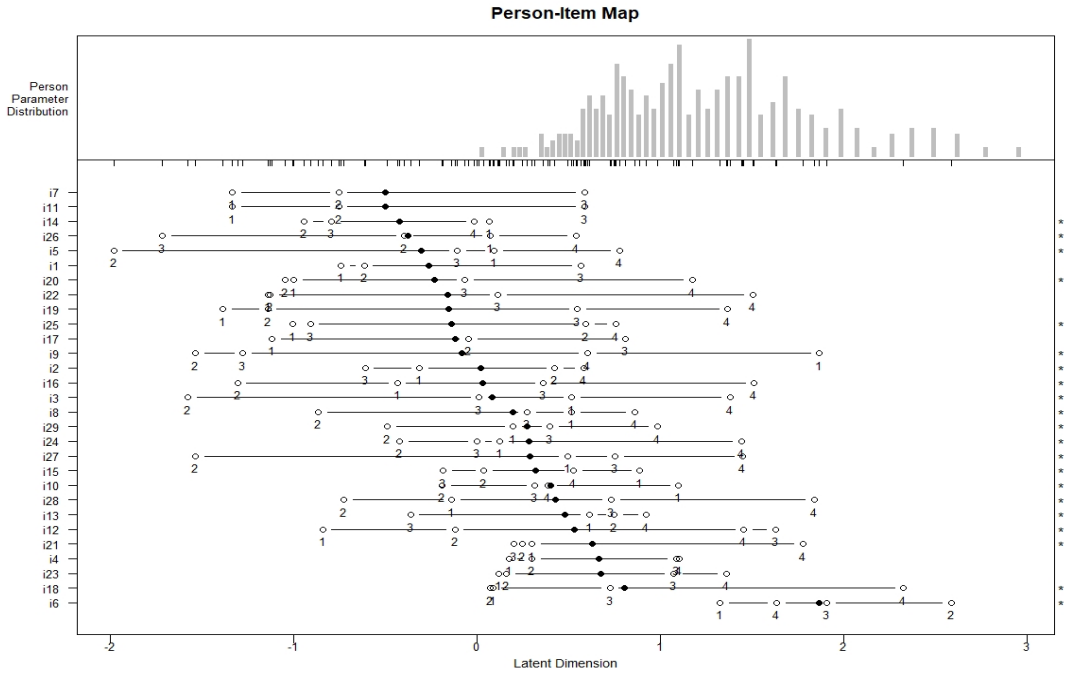


Figure 2. Wright Map

The Wright Map is usually used to describe the results of either dichotomous or polytomic responses based on the Rasch or IRT models. Wright's map image is used to see item difficulty or the level of problem difficulty with the distribution of the estimated ability (person's ability). From the picture above, the distribution of items is between -0.5 to 1.8, while the distribution of respondents' abilities is 0 to 3. That means that respondents have high abilities, while the items on the measuring instrument measure people with moderate abilities. In simple terms, the tendency of respondents to choose the "strongly agrees" choice over the other answer choices.

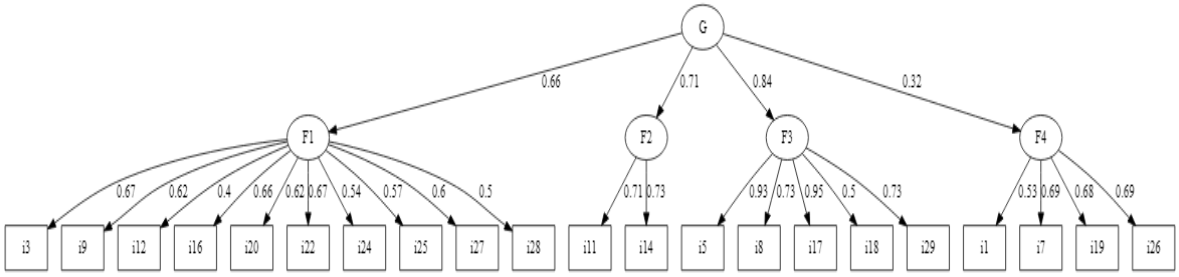


Figure 3. Distribution Model and Item Contribution

Based on the model picture above, the results of the Rasch model analysis used items that fit with the Partial Credit Model (PCM). The aim is to produce a statistical fit analysis that provides information to researchers whether the data obtained are ideal, depicting that people who have high abilities provide patterns of answers to items according to their level of difficulty. From the analysis result, the third factor or dimension has the highest contribution than the other three factors or dimensions. These factors are First aid skills and Help-seeking behavior with a factor load of 0.842. Among other items, item no. 17 has the highest load factor value. It shows that item no. 17 has a high validity value compared to other items.

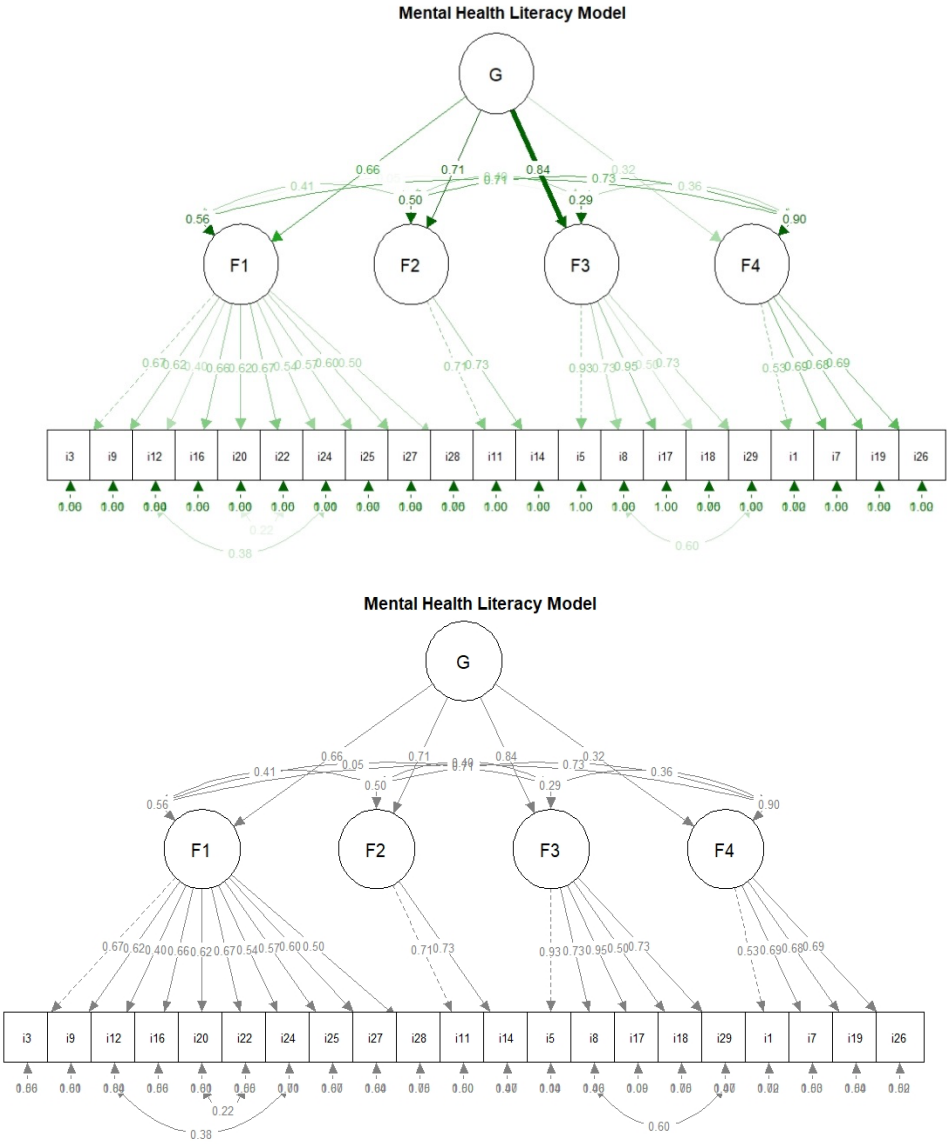


Figure 4. Mental Health Literacy

Based on results of the correlation between factors, the highest correlation is between the second factor and the fourth factor of 0.734 with a significance of <0.001. Then, the third factor is not correlated with other factors, it connotes that the factor meets the discriminant validity criteria where it can be said that the third factor measures different things. While the first, second, and fourth factors are correlated with each other, the three factors meet the convergent validity criteria that will produce the same results. For example, the higher the first factor, the higher the score on the second and fourth factors.

A mentally healthy person can realize their abilities independently, cope with life pressures, work productively and functionally, and contribute to their community (Granlund et al., 2021). A good mental health indicates a positive emotional state that includes two ideas, hedonic (happiness or pleasure) and eudemonic (trying to achieve something better), so they can thrive as a high directed personality and have desire try to find the meaning of life (Keyes et al., 2002). The existence of mental health does not stand independently since mental health is also an essential element of overall health, which is defined as a condition when a person is not in a state of illness and competent show an absolute performance in all their capabilities, and as a state of balance in oneself to other people or the environment (Bhugra et al., 2013).

Based on the theoretical explanation above, it can be concluded that a mentally healthy person can adapt to their environment, it stimulates a desire to grow positively as a better self. Mental health also includes emotional, personality, and physical abilities that are performed optimally, so they can adapt to face all the pressures that can occur in their environment. That individuals can maintain well-being and happiness in their lives positive individuals seek to raise awareness to maintain adequate mental health, identify possible

mental health problems and how to treat them, efforts to remove the stigma about mental health and seek to seek help if psychological help is needed (Kutcher et al., 2016).

Mental health awareness, or a condition in which individuals are aware of the importance of mental health, has a significant role in maintaining positive psychological well-being in individuals. The awareness involves prevention, if there are mental problems, identifying mental problems, handling and managing independently if there is mental illness unashamedly (Ravichandran et al., 2017). One of the ways in implementing mental health awareness is to obtain knowledge or information related to disorders, management, and prevention of mental health problems with media literacy. Thus, individuals who have the awareness to carry out mental health literacy can maintain their mental health status adequately (Fitri, 2019)

Mental health awareness through literacy is a concept introduced by Jorm that can be defined as an act to seek for knowledge and beliefs about mental disorders that help to identify, manage, and prevent possible mental health problems. The concept is developed that includes the ability to provide support to others who need support related to mental health, as well as psychological first aid skills (PFA). Thus, awareness about mental health is not only limited to understanding the concepts, but also having the beliefs to build positive attitudes about the importance of healthy mental qualities (Dias et al., 2018). Dimensions that indicate the quality of mental health awareness with literacy activities include the following: (a) Knowledge of mental health problems; includes understanding a mental problem, identifying, how to handle, and managing the problems, (b) The erroneous beliefs/stereotypes, include the presence or absence of negative views that involve distortion of knowledge and understanding, (c) First aid skills / help-seeking behavior, is when a person knows when and where to seek help, thereby improving the individual's mental health care and self-management. This first aid ability also aims to help and provide psychological facilities to others who are struggling with mental problems or any other uncomfortable conditions, and (d) Self-help strategies, is when a person is being able to create strategies to deal with their mental problems without any help from others, especially professionals, to change some aspects of themself. Based on the quality of each aspects above, it can be mentioned that the higher the quality of a person's awareness in the importance of mental health, then the higher a quality of their psychological well-being. Meanwhile, adequate mental health conditions are associated with high intensity and quality of physical activity undertaken by individuals (Bjørnsen et al., 2019).

Conclusion

The conclusion in this study is that the alpha coefficient on the MHL measuring instrument (Dias et al, 2018) which has been adapted and modified is 0.844. There are 21 valid items and 8 removed items. The dimension that has the biggest contribution to mental health literacy is the third dimension (i.e. First aid skills / help-seeking behavior) compared to other dimensions. In addition, the third dimension is not correlated with others. Therefore, this dimension meets the criteria of discriminant validity so the third dimension measures different aspects. While the first, second, and fourth are correlated with each other, so those three factors meet the convergent validity criteria that will produce the same results.

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