

Development of Borderline Personality Checks Using Chatbots in the Instant Messaging Application

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Abstract - Individuals with borderline personality (BP) often show risky behaviours that endanger themselves and others. Meanwhile, individuals with BP are often difficult to treat because of their unstable attitude. Therefore, a program for individuals with BP to check their own BP value is necessary. Then, at the same time they can learn to use proactive coping (PC) which can prevent BP. This study is aimed to create a program with Information Technology to find out the existence of BP in individuals and help individuals learn to solve problems with PCs. The number of participants in this study was 247 people to test the validity and reliability of the scale. The results show that both BP and PC scales are valid and reliable. Then, 11 participants did the quiz on the BP and PC and said that it was very pleasant to know their own BP value, without anyone else knowing. They also enjoy using proactive coping (PC) using information technology. Thus, the Borderline Personality Check Up quiz is useful for individual prevention and therapy. The development of the quiz on chatbots in the Instant Messaging Application will spread benefits for the people.

Keywords - Borderline Personality, Instant Messaging, Proactive Coping, Self-Assessment, Self-Learning

I. INTRODUCTION

In Diagnostic and Statistical Manual for Mental Disorder / DSM-5, it is stated that Borderline personality (BP) is a sedentary pattern that shows unstable behaviour in interpersonal relationships, poor self-image and emotions for a year starting at adulthood [1]. Some examples of sedentary behaviours shown by BP are excessive shopping, unsafe sexual activity, overeating, and actions that often lead to crime, such as stealing and breaking traffic regulation which are considered as moral or legal violations. However, according to Distel [2], it is better not to overlook the violence, emotion, frequent job loss, substance abuse, and easy marriage-divorce behaviours shown by individuals because the behaviour can be the symptom of BP.

There are around 6% of patients with BP prevalence in primary care settings, about 10% of outpatients in mental health clinics and around 20% in psychiatric inpatients [1]. The term BP is not so popular in society today compared to other disorders, such as depression,

bipolar, narcissistic, and / or bulimia. It is likely that there are still assumptions that people with BP can still live normally so there is no need to watch out for. The position of BP between psychosis and neurosis also makes some experts find it difficult to diagnose someone with BP so that they will classify her/him as neurosis or psychosis [3].

However, as BP may show risky behaviour, it is necessary to take precautionary so that the individuals will not experience BP, and they can do the therapy by themselves daily. A person can be diagnosed with BP if he is over 18 years. Therefore, prevention of the occurrence of BP can be done starting from adolescents at the age of 12-18 years [4]. Therapy can be done on individuals with BP over the age of 18.

BP prevention and therapy can be done after finding the factors that affect BP. In a study with 247 participants conducted by Wibhowo (2018), it can be concluded that proactive coping (PC) played a negative and significant impact on BP because the estimated value is -0.846 with a probability of 0.005. This shows that the higher the PC is, the lower the BPis.

Proactive Coping (PC) is an individual effort that involves cognitive and behavioural attitudes to achieve a good quality of life with an independent attitude, self-regulation, motivation, and commitment [6]. When having a problem, someone who has a PC can actively seek solutions, make reflection, plan strategies, make prevention, seek for help from those considered capable, and may look for parties who can understand, and avoid problems to be able to think clearly [6].

Individuals who have a PC will have the initiative in finding problem solving. They will try to make every obstacle a chance to progress. Thus, they are not easily distressed (one of the criteria of BP), but instead they are eager to find a way out. Individuals with a PC will try to think about the steps taken before doing something. They can also learn from their own experience when successfully

solving problems. A person who reflects on his actions will avoid impulsive and risky behaviour.

Individuals with a PC are able to break down big problems into smaller ones. Thus, they will not have BP as they will be more determined in carrying out plans in their lives.

When having problems, individuals using PC are able to manage the resources to solve their problems completely. They can manage both social and non-social resources. They can get input from others as their social resources to solve their problems. They also can manage non-social resources such as money or other things for their future lives. It can be assumed that someone who is able to manage the resources will be able to avoid being impulsive, feeling empty because of a gloomy future, and feeling less cared for.

As PC is essential to prevent and reduce BP, Information Technology (IT) is needed to help individuals learn to solve problems with PC as individuals with BP do not meet psychologists because they feel they can still live normally. Ideally, the system needed as seen in SimSensei automatically runs an interview based on the response of the interviewee [7]. SimSensei is developed by Dr. Albert "Skip" Rizzo's and Dr. Louis-Philippe Morency at the University of Southern California Institute Of Creative Technologies in Los Angeles [8]. However, self-assessment simple system such as questionnaires can be used to examine their own BP values. When the BP value is high, they can proceed to the training program to be able to solve problems with the PC. This PC training can be done repeatedly based on the individual needs.

In this research, an Information Technology-based program is made to identify the signs of BP in individuals and help them learn to solve the problems with PC. Some suggestions will be given to assist each individual. The concept will be explained in the following method and analysis.

II. METHODS

To know the existence of borderline personality (BP and the ability of proactive coping (PC) in individuals, scale is used. In this study, the term ‘quiz’ is used to substitute the term ‘scale’ to make the participants more familiar. There are four options in the quiz, namely Strongly Agree, Agree, Disagree and Strongly Disagree.

The BP scale is prepared based on the nine criteria according to DSM-5 [1], namely, feelings of fear (to panic) if abandoned, unstable and intensive interpersonal relationship patterns, and identity disturbances that are characterized by self-image instability. Other criteria are impulsivity, repeated suicidal attempts, affective instability due to the reactions to mood swings, chronic empty feelings, difficulty in controlling anger and stress associated with paranoid thinking or dissociation symptoms.

The data got from 247 participants prove that all indicators on the borderline personality (BP) scale are valid. This is indicated by the loading factor value obtained by each indicator which is more than 0.5 (Table I).

**TABLE I
BP VALIDITY TEST RESULTS**

Variable	Indicator	Estimate
BP	BP1	0,5
BP	BP2	0,6
BP	BP3	0,6
BP	BP4	0,6
BP	BP5	0,6
BP	BP6	0,6
BP	BP7	0,6
BP	BP8	0,5
BP	BP9	0,6

To get data about a PC that is owned by an individual, then use a PC scale with aspects that are active, reflective, planning strategies, prevention, seeking help from those who are considered capable, looking for parties who can understand, and avoidance.

From the results of data processing (with 247 participants) it can be seen that all indicators on the proactive coping (BP) scale are valid. This is indicated by the loading factor value obtained by each indicator which is more than 0.5 (Table II).

**TABLE II
PC VALIDITY TEST RESULTS**

Variable	Indicator	Estimate
PC	PC7	0,5
PC	PC6	0,5
PC	PC5	0,5
PC	PC4	0,7
PC	PC3	0,7
PC	PC2	0,8
PC	PC1	0,8

After the construct validity is gotten, the next is finding the reliability of the construct. In general, the limit value used to assess an acceptable level of reliability, namely if the value of construct reliability is greater than 0.7 or the extracted variance value is greater than 0.5. Table III, presents the estimated reliability.

**TABLE III
ESTIMATION OF RELIABILITY**

Variable	Indicator	Standardized Factor Loading	SFL square (Perception)	Error [ε]	Construct Reliability	Variance Extrated
BP Scale	BP1	0,5	0,3	0,7	0,8	0,3
	BP2	0,6	0,3	0,7		
	BP3	0,6	0,4	0,6		
	BP4	0,6	0,3	0,7		
	BP5	0,5	0,3	0,7		
	BP6	0,6	0,3	0,7		
	BP7	0,6	0,4	0,6		
	BP8	0,5	0,2	0,8		
	BP9	0,6	0,4	0,6		
Total		5,1	3,0	6,0		
PC scale	PC7	0,5	0,3	0,7	0,8	0,4
	PC6	0,5	0,3	0,7		
	PC5	0,5	0,2	0,8		
	PC4	0,7	0,5	0,5		
	PC3	0,7	0,5	0,5		
	PC2	0,8	0,7	0,3		
PC1	0,8	0,6	0,4			
Total		4,5	3,0	4,0		
Total		2,1	1,6	1,4		
Acceptable Borderline					≥ 0,7	≥ 0,5

Note: Thus, both the BP and PC scales are reliable.

III. PRELIMINARY STUDY

In this preliminary study there were 11 participants, aged 12-39 years. They answered the BP quiz which was presented one by one. After they completed the quiz, they would get the total of BP value. The Categories of BP values can be seen in table IV.

**TABLE IV
VALUE CATEGORY OF
BORDERLINE PERSONALITY (BP)**

Total score	Category
Less than 70	Low
71-105	Medium
105 and above	High

Participants who get a BP score of less than 70 (low) will be given two options, whether they want to continue or not to fill out the PC quiz (proactive coping). When participants whose BP scores are in the medium and high category, they are automatically advised to continue working on the PC quiz.

Three out of 11 participants, who filled out the BP quiz, received high scores, one got a moderate score, and seven people got a low score. Although not all participants were advised to work on PC quizzes, all participants were interested in continuing to work on the PC quiz.

On a PC quiz, participants are asked to imagine the situation in each item. When they are finished, participants will get scores from the PC quiz. If the value obtained is not in the high category, then the participant is given an explanation about the incorrect answer on each item and the correct way to answer, accompanied by a description of the problem. It is expected that participants can understand the problem so that they can choose the right PC.

**TABLE V
PROACTIVE COPING
VALUE CATEGORIES (PC)**

Total	Category
Less than 56	Low
57-71	Medium
72 and above	High

Furthermore, participants who have not received a high score, it is recommended to repeat answering the PC quiz so that the value can be in the medium or high category. Thus, participants will learn how to solve problems without feeling patronized.

IV. IMPLEMENTATION

Based on the concept that has been tested for several respondents, further development can use the bot chat feature available in instant messaging applications such as Line, Telegram, and Facebook Messenger [9]. The use of Artificial Intelligent Markup Language (AIML) allows questions to be displayed based on previous responses. Quizzes supported by AIML can be more interactive and have the same results as the concept.

The <template> tag in AIML is used for chat bots to understand answers from individuals by recognizing common patterns in individual answers [10]. The following questions can be designed to be displayed based on individual responses using the <that> tag. BP Quiz which is integrated into every instant messenger can benefit the younger generation. Wider impacts can increase because more people can access the BP Quiz through various media.

Application Programming Interface (API) provided by Line, Telegram, Facebook Messenger, and many instant messengers can use the same AIML to serve BP quizzes in multiple instant messengers. To make things easier, AIML can be handled by Program-O that provide an interface to store and test AIML. People who do not have education in programming can use the Program-O to manage AIML [11].

V. CONCLUSION

According to Adolf Stern, someone with borderline personality (BP) is often difficult to get therapy because of his changing attitude. In front of the therapist, he can just accordingly, understand and be able to do the therapist, but outside the therapist's room, he will be easily confused and forget the therapist's advice [12]. Therefore, this BP quiz with the help of IT is very useful for prevention and for therapy for individuals with BP.

BP Quiz can be done repeatedly so that participants can check the value of BP and the PC, in addition to learning from the items they answer. Thus, this quiz can be called Borderline Personality Check Up.

This quiz can be further developed by adjusting the development of information technology today, which integrates with chat bot available on instant messengers such as Line, Telegram, and Facebook Messenger. The benefits of this program can be felt by more people.

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