

# VALIDATION OF MALAY LANGUAGE OF DECISION BALANCE SCALE FOR SMOKING AMONG SCHOOL-GOING ADOLESCENTS IN MALAYSIA- A PROTOCOL

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## ABSTRACT

**Background:** The decision balance inventory (DBI) is a tool to assess motivation to change including smoking behavior. The aim of this study is to translate, cultural adaptation and validation in Malaysia of this tool originally designed and drafted in English.

**Materials and Methods:** The questionnaire will be translated into Malay and back-translated into English by different groups of content and language experts, and the final version of Malay language will be administered to thirty school-going adolescents to establish the face validity. Confirmatory factor analysis (CFA) will be used to establish the construct validity of DBI-Malay among 622 school-going adolescents, in which the sample size is determined based on population Root Mean Square Error of Approximation (RMSEA) of 0.075, and non-response rate of 20%. Reliability of the tool will be determined using internal consistency and test-re-test analysis.

**Expected Outcome:** The study will enable the psychometric properties of DBI can be established in Malay language. Consequently, the instrument can be used in planning cigarette smoking initiation and cessation interventions among Malaysian school-going adolescents.

**Keywords:** validation, Decision Balance inventory, Malay language, school going adolescents

## 1.0 Introduction

Smoking-related disease is one of the major causes of premature death globally (Beaglehole et al., 2011). A similar pattern was reported in Malaysia (Institute of Public Health, 2015), in which 20,000 death reported annually was due to smoking-related diseases. The mortality rate will increase if there are no changes in smoking prevalence among Malaysian adults (Ministry of Health, 2015). According to the National Health and Morbidity Survey 2015, the prevalence rate of current smokers in Malaysia is 22.8% (Institute of Public Health, 2015; Lim et al., 2018). The survey also revealed that almost 70% of smokers initiated their smoking behaviour before the age of 18. Therefore, by reducing the incidence of smoking initiation among youth and increasing the smoking rate among youth, it will significantly reduce the prevalence of adults smokers in the future (Institute of Public Health, 2015).

However, nearly 15% of school-going adolescents in Malaysia still smoked (Institute of Public Health, 2017). Those adolescents who smoked currently will most probably to continue as smokers in the future and have a higher risk to exposure to smoking-related diseases such as cancer and cardiovascular diseases (U.S. Department of Health and Human Services, 2004; National Cancer Institute, 2015; Centers for Disease Control and Prevention 2019). Similarly, those smokers who quit smoking will enjoy the similar health effects (Jha et al., 2013). However, addicted to nicotine, relapse after stopping the social benefits of smoking that prevent smokers from quitting, like enhanced feelings of relaxation (McChargue et al., 2004). Usually, Persons who smoke for a long time will not be influenced by the benefits of quitting cigarette smoking, especially when the diseases related to smoking have not developed obviously (Ellickson et al., 2001; Aveyard et al., 2005).

Successful approaches to prevent the initiation of smoking and enhance the cessation of cigarette smoking among adolescents are often based on behavioural change models. The Transtheoretical Model (TTM) (Prochaska et al., 1994; Prochaska et al., 1997) evaluates an individual's readiness to act on a new and healthier behaviour. It also provides approaches for change to guide the individual. The TTM consists of four constructs: stages of change, namely, processes of change, self-efficacy, decisional balance and temptations (Glantz et al., 2008). Decisional balance as the focus of the out study, refers to the concept that pros and cons are essential in the decision-making process for behavioural change.

The brief Decision Balance Inventory (DBI) was developed by Pallonen et al. (1998) and consisted of 12 items, which consists of three factors, including cons of smoking (six items), social pros (three items) and coping pros (three items). Each of these items is rated on a five-point Likert-type scale (1 = *not important* to 5 = *extremely important*). There is a need for a questionnaire on health behaviour changes that are applicable in various cultural settings. Culturally and linguistically competent scales such as the DBI consider cultural values, beliefs, and practices that could differ among diverse people. So, it is essential to re-assess the validity and reliability of this scale in a specific culture: an example would be the Malaysia setting in which the prevalence of smoking among male adult and adolescents is still high. Therefore, the aim of this research is to establish the Malay version of the DBI among Malaysian adolescents and young adults.

## 2.0 Materials and Methods

### 2.1 Translation

The forward-backwards method will be used to translate the DBI from English into Malay language. For the forward translation, one content expert and language expert will translate the scale into the Malay language. Then, the Malay versions of DBI will be translated into the English language. The final version will be evaluated by the research team members, both content experts and the translators.

The final Malay version of DBI will be sent to five content experts, who will measure each item in DBI using the Likert type scale of 1-4 ( 1 = *not relevant, not simple and not clear* to 4 = *very relevant, very simple and very clear*). The content validity index (CVI) and the content validity ratio (CVR) will be calculated, in which the CVI will be assessed as the proportion of items on a scale that attained a rating of 3 or 4 by the experts. Whereas the CVR will be tested to determine the essentiality of each item in a scale. The result obtained will be compared with Lawshe Table (Lawshe, 1975).

### 2.2 Face Validity

Face validity will be established through the pilot test among 30 school-going adolescents, and all respondents will be asked to evaluate all the items in the DBI, from the aspect of difficulty or ambiguity in replying to the Malay version of the DBI. The impact score (frequency × importance) will be used to measure the percentage of school-going adolescents to evaluate each item as important or quite important on a five-point Likert scale. Items would be considered to be appropriate if they had an impact score equal to or more than 1.5 the adolescents (Lacasse et al., 2020).

### 2.3 Construct Validity

Construct Validity will be established through a cross-sectional validation study in selected secondary schools in Sungai Buloh, Selangor, two proportionate to size sampling will be employed to select the secondary school-going adolescents, the first stage will be a random selection of the school followed by the selection of classroom from the selected school. All students from the selected class will be invited to participate in the study.

The sample size is determined by using the Structural Equation Modelling methods available in Statistical software.

Based on the 12 items in DBI, and three domain available in DBI questionnaire, so The Degree of Freedom is

$$\begin{aligned} Df &= [(\text{number of items} - \text{number of domains})^2 - (\text{number of items} + \text{number of domains})] / 2 \\ &= [(12-3)^2 - (12+3)] / 2 \\ &= [81-15] / 2 \\ &= 33 \end{aligned}$$

Based on population Root Mean Square Error of Approximation (RMSEA) of 0.075,

Null hypothesized  $RMSEA \leq 0.05$

Alpha (Type 1 error) = 0.05

Power of study = 0.80

Required sample size is = 518.

Expected non response rate of 20% : Required sample size are  $518 \times 1.2 = 622$  students.

## 2.4 Protocol

### *Ethical Considerations*

The approval from the study will be obtained from the Ministry of Education Malaysia, Selangor State education department, while ethical approval will be obtained from the Medical Research and Ethical Committee, Ministry of Health Malaysia. Only the selected respondents with written consent from their parent/guardian will be allowed to participate in the study.

The self-administered paper-and-pencil questionnaire will be conducted during schooling time in the presence of a research team members, who will explain the purpose and procedure of the study. Participants will be assured their feedback is anonymous and confidential, and that they can quit the study at any given time that they wish to. Informed consent will be obtained for all participants. The questionnaire will take approximately 20-30 minutes to complete.

## 2.5 Statistical Analysis

Confirmatory factor analysis (CFA) will be applied in order to assess the coherence between the data and the structure. The model fit will be evaluated using multiple fit indices, namely relative Chi-square, Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), Non-Normed Fit Index (NNFI), Normed Fit Index (NFI) and Standardized Root Mean Square Residual (SRMR) will be taken into account. The GFI, CFI, NFI, and NNFI value range between 0 and 1, but values equal to .80 or above are commonly indicated as acceptable model fits]. An RMSEA value between .08 and .10 shows an average fit while a value below .08 shows a good fit. Values below .05 would indicate a good fit for SRMR, but those values ranged between .05 and .08, and between .08 and .10 may indicate a close fit or are acceptable, respectively (Schumacker & Lomax, 2010).

## 2.6 Reliability

Internal consistency (Cronbach's alpha coefficient) and test-retest analysis (intraclass correlation coefficient- ICC) will be used to assess the reliability of the DBI. The scale will re-administered to 40 school-going adolescents one week after the first completion. Cronbach Alpha value of 0.7 will be used as cut off point for the internal consistency (Nunnally and Bernstein, 1994), whilst ICC values of .40 or above are considered acceptable (r's between .81 and 1.0 are excellent, between 0.61 and .80 are very good, between .41 and .60 are good, between .21 and .40 are fair, and between .0 and .20 are poor) (Plichta et al., 2010)].

All analyses will be performed using the statistical program SPSS for Windows version 23.0 and Amos version 24.0.

## 3.0 Discussion

The validation of DBI in Malay language will enable the tool of motivation of change can be established for usage among Malaysian school-going adolescents. The tool with assist the researchers to enrich their study and the outcomes of the studies will assist in the formulation of suitable policies and measures to address the smoking problem among youth in Malaysia. In which the prevalence of smoking especially among males school-going adolescents have not reduced to the "satisfactory" level compared to the smoking rate among youth in the region.

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## Declaration

No conflict of interest is declared

## Author Contribution

Author 1: Literature review and written the final version of manuscript.

Author 2: contributed to the idea for the study, and revised the manuscript.

Author 3: Design the study and revised the manuscript.

Author 4: Literature review, and revised the manuscript.

Author 5: Study design, statistical analysis and revised the manuscript.

## References

- Aveyard, P., Markham, W. A., Lancashire, E., Almond, J., Griffiths, R., & Cheng, K. K. (2005). Is inter-school variation in smoking uptake and cessation due to differences in pupil composition? A cohort study. *Health Place, 11*(1), 55-65.
- Beaglehole, R., Bonita, R., Horton, R., Adams, C., Alleyne, G., Asaria, P., Baugh, V., Bekedam, H., Billo, N., Casswell, S., & Cecchini, M. (2011). Priority actions for the non communicable disease crisis. *The Lancet, 377*(9775),1438-1447.
- Centers for Disease Control and Prevention. (2019). How to Prevent Cancer or Find It Early. Retrieved from <https://www.cdc.gov/cancer/dcpc/prevention/index.htm>
- Ellickson, P. L., McGuigan, K. A., & Klein, D. J. (2001). Predictors of late-onset smoking and cessation over 10 years. *Journal of Adolescent Health, 29*(2), 101-108.
- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: theory, research, and practice*. Jossey-Bass: Wiley.
- Institute of Public Health. (2015). *National Health & Morbidity Survey 2015. Smoking among Malaysian adults*. Malaysia: Ministry of Health.
- Institute of Public Health. (2017). *National Health & Morbidity Survey 2017. Malaysia Global School Health Survey*. Malaysia: Ministry of Health.
- Jha, P., Ramasundarahettige, C., Landsman, V., Rostrom, B., Thun, M., Anderson, R. N., McAfee, T., & Peto, R. (2013). [21st Century Hazards of Smoking and Benefits of Cessation in the United States](#). *New England Journal of Medicine, 368*(4), 341-350.
- Lacasse, Y., Godbout, C., & Series, F. (2002). Health-related quality of life in obstructive sleep apnoea. *European Respiratory Journal, 19*(3), 499-503.
- Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology, 28*(4), 563-575.

- Lim, K. H., Teh, C. H., Sayan, P., Jane Lim, M. Y., Fadhli, M. Y., Sumarni, M. G., Kee, C. C., Lim, K. K., & Lim, H. L. (2018). Prevalence and factor/s associated with smoking among Malaysian adults- Findings from the National Health and Morbidity Survey (NHMS) 2015. *Tobacco Induced Disease*, 16, 1-12.
- McChargue, D. E., Spring, B., Cook, J. W., & Neumann, C. A. (2009). Reinforcement expectations explain the relationship between depressive history and smoking status in college students. *Addictive Behaviours*, 29(5), 991-994.
- Ministry of Health. (2015). *National Strategic Plan for Tobacco Control*. Malaysia, Putrajaya: Ministry of Health.
- National Cancer Institute. (2015). What Is Cancer? Retrieved from <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
- Nunnally, J., & Bernstein, L. (1994). *Psychometric theory*. New York: McGraw-Hill Higher, INC.
- Pallonen, U. E., Prochaska, J. O., Velicer, W. F., Prokhorov, A. V., & Smith, N. F. (1998). Stages of acquisition and cessation for adolescent smoking: an empirical integration. *Addictive Behaviors*, 23(3), 303-324.
- Plichta, S. B., Kelvin, E. A., & Munro, B. H. (2012). *Statistical methods for health care research*. Wolters Kluwer Health/Lippincott Williams & Wilkins Publisher.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., Fiore, C., Harlow, L. L., Redding, C. A., Rosenbloom, D., & Rossi, S. R. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*, 13(1), 39-46.
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion*, 12(1), 38-48.
- Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling*. New York: Routledge.
- U.S. Department of Health and Human Services. (2004). *The health consequences of smoking: A report of the surgeon general. The Health Consequences of Smoking*. Atlanta (GA): Centers for Disease Control and Prevention (US).