The Development of Driver's Evaluation in Malaysia: A concept paper

Mohamad Ghazali Masuri[1], Akehsan Dahlan[1],
Ajau Danis[2], Khairil Anuar Md Isa[2]

[1] Occupational Therapy Department, Faculty of Health Sciences,
[2] Basic Sciences Department, Faculty of Health Sciences,
Universiti Teknologi MARA, Malaysia.

zalie222@gmail.com

Abstract

Road traffic accident (RTA) frequently involves multi-level society and this has become a demanding community issue where more serious participation is needed to improve driver's attitude in the future. RTA has a significant impact on quality of life and financial burden to the government and Malaysian society. Currently, there is limited local evidence supporting the elements of driver's attitudes. This concept paper will discuss a potential method to be used in developing valid and sensitive driver's evaluation. This evaluation may help the government of Malaysia to produce better road users in the future)

Keywords:road society,driver's attitude assessment

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1.0 Introduction

Accident involving road transport has a momentous impact on person, government and our society. According to Malaysian Institute of Road Safety (MIROS), a model has been predicted the fatalities for the year 2015 are 8,760, while for the year of 2020 will be increased to 10,716 (Sarani, Rahim, Jamilah Mohd Marjan, & Wong Shaw Voon, 2012). The number of RTA is increasing and addresses significant demands for better action. Many studies had proven that, drivers factor was identified as a significant contribution to RTA. Driving is an intricate daily activity that involves active eye, hand and foot coordination. Drivers who fail to organize and interact with the machine and environment may lead to road traffic injury (RTI) (Masuri, Isa, & Tahir, 2012). According to (Alert Driving Megazine, 2011), 90% of road traffic accidents were caused by human error. This made the human error as an important ergosystem component that need to be further investigate. Road users who use the road either for leisure or work purposes usually exposed to the risk of accident/injury. With regards to driving assessment, there are many drivers related assessment available worldwide and these they were varies from one and another.

2.0 Literature Review

Valid and reliable assessment is vital. It will help to determine appropriate intervention and rehabilitation plan. Unfortunately, there is no local assessment available to assess Malaysian driver's attitude towards safe driving behavior. It is impossible to create single attitude assessment related to driving that fits to all due to the complexity of human behavior including driving activity (Masuri, Isa, & Tahir, 2012) itself, yet 'local norm' related to high/low risk drivers should be establish as fundamental references for further research. Many studies has proven that, attitudes rarely present the synchronize behavior. Attitudes can be presented either in positive or negative form. Even though attitude and behavior were not usually straightforward and they are sensitive according to social situation, but, attitude assessment can be used to predict future behavior (Iversen, 2004). Attitude also has significant relationship with our beliefs (Eagly, Mladinic, & Otto, 1994). According to (Eagly & Chaiken, 1993), attitudes can be defined as

"…tendency to evaluate an entity with some degree of favor or disfavor, ordinarily expressed in cognitive, affective and behavioral responses".

With regards to risky driving behavior, there were lacks of investigation conducted on safe attitudes (Iversen, 2004). Currently, many literatures claim that accident caused by human error yet, limited evidence available to justify which human components are needed to be address. Previous study shows that, different factors such as sociodemographic issues (Al-Naggar, Bobryshev, & Mohd Noor, 2013; Hatfield & Fernandes, 2004), socioeconomic status (Goldzweig et al., 2013; Kim, Depue, Spence, & Reine, 2007; Masuri et al., 2012), rural/urban location (Eiksund, 2009; Kim, et al., 2007; Rakauskas, Ward, & Gerberich, 2009), age/gender (Kim, et al., 2007; Lapparent, 2008; Mohamed et al., 2009; Mohammadi, 2011; Scott-Parker, Watson, King, & Hyde, 2012), education level (Demirer, Durat, & Has, 2012; Masuri, Isa,

Tahir, et al., 2012; Vakili, Danaei, Askarian, C.J., & Abdollahifard, 2012), body anthropometry (Pheasant, 1990), living status (Al-Naggar, et al., 2013) and personality (Chen, 2009) brought significant effects on driving behavior. However, those assessments were not environmental and culturally sensitive to Malaysian population. To date, there is no specific attitude assessment developed locally. This require for more valid and reliable attitude scale which should address the uniqueness and sensitivity of Malaysian drivers. This proposal is critical in developing valid and culturally sensitive attitude assessment for young Malaysian drivers. Standardized assessment should be able to help the government to refer to the identical and valid information. With regards to professional perspective, the use of standardized assessments is essential in helping to improve the quality and quantity of information for making accurate decision.

3.0 Methodology

The process of literature search involves literature searching from an online journal, hard copy, books, newspaper and other internet based resources. Few search engines were used during the online searching. The most common online database used were Googlescholar.com, Medline database, Cochrane review, Royal Malaysia Police, MIROS Malaysia, JKJR.com, thesis online, WHO website, local newspaper, onthescene.com and sciencedirect.com. The scope of this proposal will focus on driving attitudes that contribute to either high or low risk driving behavior. This proposal will limit the investigation based on five major risk factors as stated in the global status report on road safety 2013 by WHO; speed, drink-driving, helmet, seat belt, child restraint (Jabatan Keselamatan Jalan Raya Malaysia, 2013) and other six offences that lead to maximum penalties (Road Transport Act 1987): exceeding the speed limit, involved with a traffic accident, disobey stop signal – red light, overtaking at double line, overtaking others in the queue and using an emergency lane/left lane (Royal Malaysian Police, 2007). Since some factors such as drink-driving, wearing helmet and child restrain neither were nor meet with inclusion criteria, these factors will be excluded from this study. Another three factors such as, mobile phone usage, signaling and respect to others were added based on researcher previous study (Isa et al., 2012). Figure 1 shows the overview of the conceptual framework.

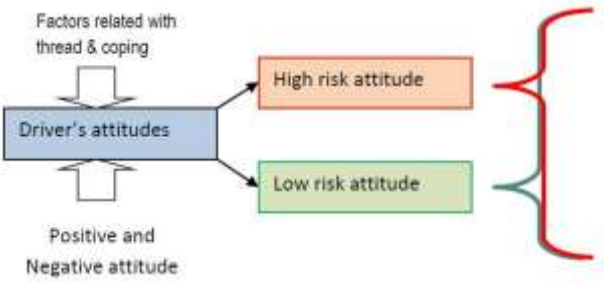

Figure 1: Conceptual framework

4.0 Results and Discussion

The first stage of data analysis (qualitative approach), data analysis will be done simultaneously with ongoing data collection. The data on focus group will be analyzed based on thematic analysis. Based on two process of thematic analysis, theme emerge will be further explore and interview will be discontinued once the theme has saturated (Wimpenny & Gass, 2000). Atlas.ti. software will be used in the process of transcribe interview, segmentation and coding as well as building of conceptual network (Muhr, 1991). The second stage of data analysis, questionnaires validity will be analyze using Rasch model. The Rasch models for measurement are currently the closest generally accessible approximation of these fundamental measurement principle for human sciences (Bond & Fox, 2010). The Rasch model is the simplest model in item respond theory (IRT) and requires all of the item to measure the same latent trait (Chang & Shih, 2012). Ability of the person and difficulty of the item will be analyzed. Two types of formulation will be used to assess the item and person: the rating scale Rasch model (definition of the rating scale is identical for all item) and the partial credit Rasch model (when one item differ from another) (Chang & Shih, 2012). Rasch model will produce items and individual separation index (Ariffin, Omar, Isa, & Sharif, 2010). This index will be further used in analyzing the fit item with individual. In order to identify two category of ASDS result (low or high risk drivers), receiver operating characteristic (ROC) curves will be used to determine a cutoff value. ROC curve is the common analysis used in clinical test in identifying the cut off value (Sigmaplot, 2013). For the final stage of data analysis, this proposal will engage on SPSS version 19 (or above) to correlate the paper based score (ASDS- low or high risk drivers) with participant performance in driving simulation test. Participant driving behavior will only be observed after 3 minutes from the time of simulation begin. This will allow the participant to be settled and to control observed behavior. Cronbach alpha coefficient will be used to evaluate the internal consistency of the driving simulation. Structure Equations Model (SEM) correlation matrix and structural model will be estimated with the maximum likelihood technique. Two steps approach of SEM which involves Confirmatory Factor Analysis (CFA) used to evaluate the measurement model and fit index. The appropriate fit index such as: goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA) (Chen, 2009; Yılmaz & Çelik, 2008) will be used accordingly.

4.1 Stage 1

For the qualitative process, focus group interview will be conducted to explore and generate further question in developing the ASDS. ATLAS.ti software will be used to manage the respondent data. Questions will be developed according to the theme emerges. Some of the interview components will be focus on the factors as stated on PMT (Masuri et al., 2014). Semi structured interview – direction of interview according to components in (Isa, et al., 2012; Jabatan Keselamatan Jalan Raya Malaysia, 2013; Royal Malaysian Police, 2007). Propose model of interview based on (Chen, 2009; Lund & Aarø, 2004; Wu, Stanton, Li, Galbraith, & Cole, 2005)

4.2 Stage 2

Questionnaire development of ASDS will be based on participant respondent according to appropriate theme. This design will involve pilot study and questionnaire validation. Standard protocol suggested by development and validation process as (Midge et al., 2006). The ASDS will be piloted and result will be analyzed. The total number of participant will be identifying once the first stage of questionnaire development has completed. As recommended by (Anderson, 1988), the number of participants should be at least five times of the number of the questions. Purposive sampling yet different participant between EFA and CFA analysis (Costello & Osborne, 2005). Rasch analysis will be conducted to validate the questionnaires.

4.3 Stage 3

The final stage will involve driving simulation experiment (STISIM protocol) to validate the result with ASDS score. Participant who involved on stage 2 will be encouraged to participate on the driving simulation test Purposeful sampling method). Phone call/SMS method will be practice as a follow-up method. In order to correlate the ASDS and driving performance, simulation test will be conducted to the participant who had involved on stage 2. They will be called to sit for the simulation test. Participant driving ability will be tested using a standard driving simulation STISIM M400 – USA, California. All testing will take place between 9.00 a.m. to 12.00 p.m. (real time) only. Each participant in this proposal will go through a standard protocol.

5.0 Conclusion

This proposal is expected to guide future study to develop an assessment which able to measure save attitude among young Malaysian drivers. This evaluation can be used in screening and re-evaluation process of licensing in Malaysia. This evaluation also will be able to help the government in producing a better road society in the future.

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