

Road Traffic Safety Culture of E-Hailing Drivers: A Scoping Review

Nurul Muhayuni Mahayuddin, Sharifah Norkhadijah Syed Ismail

Department of Environmental & Occupational Health, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.

Email: nrl.muhayuni@gmail.com

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Abstract

Traffic safety culture is an essential aspect of the entire traffic system as it is an intricate internal determinant that can affect the behaviour of road users. Therefore, driving behaviour and perceived crash risk in public transportation have been extensively explored, especially in taxis and buses. E-hailing vehicle services have been introduced as an alternative public transportation. The aim of this scoping review is to investigate work published on the driving behaviour of e-hailing drivers and perceived crash risk. A scoping review was conducted using the methodological framework of Arksey and O'Malley to identify a broad range of relevant literature, regardless of study design. A comprehensive and systematic search was performed using Science Direct, Taylor & Francis, Sage Publications, and Emerald Publishing. Each database was searched for literature published between 1st January 2008 and 11th September 2023. Authors independently assessed literature eligibility and extracted data to answer the research question 'What is known from existing literature between traffic safety culture and its relationship towards e-hailing driving behaviour and perceived crash risk?'. Three articles were included in the review. There appears to be a paucity of research or results-oriented evidence regarding traffic safety culture towards driving behaviour of e-hailing drivers and perceived crash risk. Driving behaviour of other work related to the road was reported. Owing to the lack of research and the inadequate descriptions of design and method in the driving behaviour of e-hailing drivers and perceived crash risk in most of the articles included, there is little evidence in the existing literature to drivers and policymakers in the field of work related road safety. This indicates a need for further research in this area.

Keywords: Traffic Safety Culture, Driver Behaviour, Crash Risk, Work Related Road Safety, E-Hailing

Introduction

The road transport sector is the backbone that supports the prosperity and the socio-economic development of the country. An efficient public road transportation system will contribute towards the creation of a conducive ecosystem that will facilitate the movement of people in the country.

Malaysians are mostly diverted towards cars as public transportation is progressing. One of the booming modern public transport systems in Malaysia is e-hailing services. E-hailing vehicle is a private vehicle used to provide public transport services to passengers who book through electronic applications (APAD, 2023). This service penetrated the Malaysian market in 2017 and proved to spur its growth with the passing of the 2017 amendments to the Land Public Transport (Amendment) Act 2020 and the Commercial Vehicles Licensing Board Act 1987 (Act 334) (Government of Malaysia, 2020).

However, with the increasing trends of the e-hailing services in Malaysia, there is an uncertain situation as over the past decade, road fatalities are one of the main cause of deaths in the country. According to the Department of Statistics Malaysia in 2020, an average of 6,540 people died due to road crashes every year. Any road crash that results in death or injury is unacceptable in the traffic system (Ministry of Transport, 2022).

A search of the literature revealed that traffic safety culture is an important part of the entire traffic system as it is a complex internal factor that can affect the behavior of road users (Akinori Morimoto et al., 2022). The traffic safety culture of drivers is reflected by the beliefs and attitudes within their own community towards traffic safety-related matters. It is defined as “the socially constructed abstract system of meaning, norms, beliefs, and values held by a group of people” (Myers et al. 2014).

Furthermore, human behavior, such as non-compliance with road laws, fatigue, and driving over the speed limit are among the main contributors of road crashes. According to NHTSA (2015), 90% of road crashes are caused by human error.

Research conducted on the traffic safety culture and the driving behaviour of e-hailing drivers and perceived crash risk is limited. A scoping review was performed to systematically map the knowledge of traffic safety culture and driving behaviour of e-hailing services.

The aim of this scoping review was to investigate work published on the traffic safety culture and its relationship to driving behaviors of e-hailing drivers and perceived crash risk.

Method

Design

For this literature review, the scoping review reported in this paper followed a model proposed by Arksey and O'Malley (2005). The framework comprises five stages: 1) identifying the research question, 2) identifying relevant literature, 3) selecting literature, 4) charting data, and 5) collating, summarising, and reporting results.

Identifying the Research Question

The research question used within this scoping review was as follows: What is known from existing literature between the driving behaviour of e-hailing drivers and perceived crash risk?

Identifying the Research Literature

A systematic search was performed in the electronic databases. Within this process, relevant articles were sought from search engines including Science Direct, Taylor & Francis, Sage Publications, and Emerald Publishing. Each database was searched for literature published between 1st January 2008 and 11th September 2023. A number of keywords were used in varying formations such as truncation symbols: traffic safety culture; "traffic safety culture*". Keywords, such as 'traffic safety culture', 'driver behaviour', 'crash risk', 'work related road safety' and 'e-hailing' is used. The selection process is made using the search phrase Boolean with a combination of "OR" and "AND" Boolean operator to fulfil the identification purpose. The advanced search string is (road traffic safety culture) AND (driving behaviour AND crash risk) AND (e-hailing OR ride hailing) AND (work related road safety).

Selecting literature

Initially, a total of 196 articles were identified. This initial search revealed the following results: Science Direct-N = 66 results, Taylor & Francis-N = 69 results, Sage Publications-N = 44, and Scopus-N = 17 results, for a total of N = 196 results. These articles abstracts were reviewed. Duplicates were excluded (N-183), as were articles that did not report e-hailing driver's risky behaviour and/or were not conducted within e-hailing services. After duplicates were removed, titles and abstracts of 184 articles were screened based on the inclusion and exclusion criteria in Table 1 and 13 articles were read in full text. Finally, only three articles were selected. These articles were then examined to determine if they could be included in the scoping review based on their relevance to the research question. The selection process is shown in Fig. 1.

Table 1

Inclusion and Exclusion Criteria

| Criterion | Inclusion | Exclusion |
|-------------------------------|--|--|
| Types of literature / studies | All relevant quantitative and qualitative studies/literature on the phenomenon | Editorial, short communication and letters |
| Time period | 1st January 2008 until 11th September 2023 | Before 1st January 2008 and after 11th September 2023 |
| Types of drivers | E-hailing driver | All other professional drivers |
| Phenomenon of interest | Traffic safety culture and its relationship towards e-hailing driving behaviour and perceived crash risk | All other traffic safety culture and its relationship towards e-hailing driving behaviour and perceived crash risk |

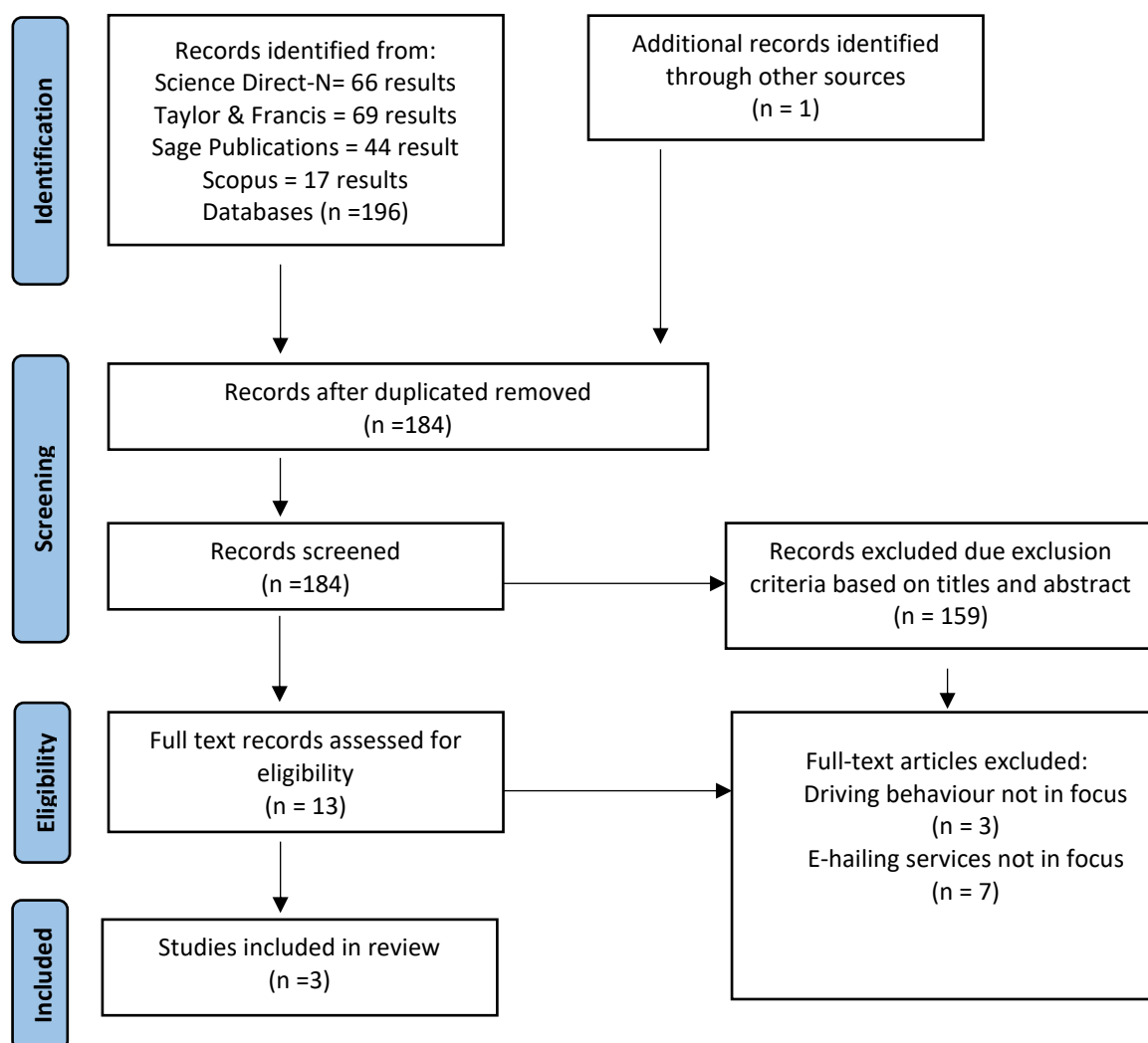


Figure 1. Summary of the Selection of Publications

Charting Data

Arksey and O'Malley (2005) describe data charting as a process where both a narrative and an analytic approach are used to extract data from articles that best address the research aim. This is a technique for synthesising and interpreting data by sifting, charting, and sorting material according to key issues and themes (Arksey and O'Malley, 2005). Summaries of each article and were categorised into authors, publication year, country, aim, design/methods, participants/sample size, and outcomes, into a scoping table. Table 2 provides an overview of the included material. The literature was organised thematically according to important issues related to driving behaviour of e-hailing drivers and perceived crash risk.

Table 2

The Overview of Included Literature

| Authors and countries | Aim | Design / method | Participants/ Sample size | Outcomes |
|--|---|------------------------|--|---|
| Mahudin & Sakiman (2020) Malaysia | To conduct systematic investigation into the differences in the perception, attitude, behaviour, and working hours among the drivers. | Questionnaire survey | 80 drivers (Taxi: n= 40; E-hailing: n= 40) | The e-hailing drivers reported a significantly higher safety climate perception than taxi drivers but no significant difference was obtained for unsafe driving behaviour. |
| Jing Shi et al. 2023 China | To analyse the factors of aberrant driving behaviors and road accidents among Chinese ride-hailing drivers. | Questionnaire survey | 420 ride-hailing drivers | Among ride-hailing drivers, the traditional taxi drivers were found to be more involved in aberrant driving behaviors than private car drivers. The ride-hailing drivers were involved in risky violations. |
| Jing Shi et al. 2022 China | To estimate the direct and indirect effects of personal attribute and work-condition factors on aberrant driving behaviours of ride-hailing drivers in China. | Questionnaire survey | 420 ride-hailing drivers | The results of the model demonstrate that driving style is an important factor negatively effecting other aberrant driving behaviours. |

Collating, Summarising and Reporting Result

Among the three articles there were two articles conducted in the China and one in Malaysia. Design and methods were described as using questionnaire such as Manchester Driver Behaviour Questionnaire (MDBQ) and the Safety Climate Questionnaire (SCQ) in the first article and adopted Driver Behavior Questionnaire (DBQ) in the second and third article. The first article described the questionnaire were translated into the Malay language using the forward-only translation by a certified professional translator. This technique was used because it could ensure that the meaning of the translated text would be maintained and have a cross-cultural and conceptual focus, rather than a focus on linguistic or literal equivalence.

Findings and Argument

This scoping review investigated literature published on driving behaviour e-hailing drivers and perceived crash risk.

The results suggest a paucity of research into the driving behaviour e-hailing drivers and perceived crash risk. With the expansion of e-hailing market combine with e-hailing act implementation, it was surprising to find so few published studies on its use in this field.

In three of the articles investigated, the reports on e-hailing drivers do not emphasize on traffic safety culture, but rather focus on safety climate perception for unsafe driving behaviour besides the factors of aberrant driving behaviors contributes to road accidents. Therefore, it is difficult to assess whether these findings are relevant for traffic safety culture and its relationship to driving behaviors of e-hailing drivers and perceived crash risk.

The use of a methodological framework and a documented method for the literature search adds strength to this study. However, there are limitations, as different terms are used to describe electronic ride sharing, as certain countries use definition of e-hailing, ride hailing and ride sharing. To identify relevant literature, different terms used to describe e-hailing service drivers were included in the search strategy. It is possible that we may have excluded literature where traffic safety culture and its relationship to driving behaviors of e-hailing drivers and perceived crash risk. Furthermore, our literature search of publications was performed within language restrictions. Therefore, we may not have been able to identify all of the existing literature.

This scoping review accessed four databases. For a wider scoping review, it could possibly be advantageous to utilize other data bases with respect to the scoping review research question in order to identify a greater number of relevant studies.

Conclusions

The combination of a lack of evidence and literature with insufficient design and method indicate the need for more research regarding road traffic safety culture specifically driving behaviour and perceived crash risk among e-hailing drivers. Knowledge gaps on matters such as awareness on effective driving behaviour in long hours driving need to be investigated further.

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