

## Indonesian version of the motorcycle rider behaviour questionnaire: cross-cultural adaptation and validation

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### ABSTRACT

The study revealed that safety behaviour played a significant role in traffic accidents. One of the primary concerns pertains to the implementation of driving safety practices and the associated risks they pose on the roadways. Numerous studies have been conducted in various countries to investigate the negative consequences of safety behaviour on both victims and nations. These studies have employed the motorcycle rider behaviour questionnaire (MRBQ), a widely utilized instrument to evaluate and mitigate the prevalence of hazardous behavior in road driving scenarios. Nevertheless, the validity of this method has not been established in the Indonesian setting. The present study aimed to assess the reliability and construct validity of the Indonesian adaptation of the MRBQ. The study recruited a cohort of 37 students representing a diverse range of academic disciplines from 12 distinct universities. The study's findings revealed that the validity values obtained varied between a minimum of <0.001 and a maximum of 0.987. Additionally, the reliability of the 27 items was assessed using Cronbach's alpha coefficient, which yielded a value of 0.742. The present study confirms the reliability of the Indonesian version of the MRBQ, as well as the acceptability of its construct validity, which exceeds the threshold of 0.70. Therefore, this tool can be valuable for evaluating driving safety behaviour.

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## 1. INTRODUCTION

According to the World Health Organisation, the number of road traffic deaths has fallen slightly to 1.19 million per year. There were an estimated 1.19 million road traffic deaths in 2021 – a 5% drop when compared to the 1.25 million deaths in 2010 [1], [2]. Two-wheel motor vehicles face the most remarkable fatality rate among adults aged 15-29 [1], [3].

As one of the developing countries, Indonesia has 120 deaths each day due to traffic accidents [4]. Data of National General Plan for Safety (*Rencana Umum Nasional Keselamatan (RUNK)*), in 2022 in Indonesia, it is known that the number of deaths due to Road Traffic and Transportation (*Lalu Lintas dan Angkutan Jalan (LLAJ)*) accidents that occurred in 2020 has reached 23,529 people, or equivalent to three deaths per hour and based on age groups in 2016-2020 the age group of 15-34 years is the highest [5]. Data from the National Police Traffic Corps revealed that in the period January 2022 to 13 September 2022, 94,617 cases of traffic accidents were recorded in the territory of the Republic of Indonesia. This number has increased by around 34.6% compared to 2021, namely 70,000 accident cases. The death toll from traffic accidents in 2021 reached 25,266 people, and in 2022 there will be

26,100 deaths. This data does not include victims of serious injuries and minor injuries. Then, the type of vehicle involved in the accident was a motorbike, 73% [6]. Meanwhile, for Central Java Province, based on data from the National Police Traffic Corps in 2023, 41,300,000 traffic accidents were recorded [7].

Driving safety behavior is an essential factor in a traffic accident. The main reasons for road accidents include human behavior, vehicular factors, and environmental conditions. Human factors significantly contribute to the incidence of accidents. The human factor is a factor causing 70% of accidents, this is because there are many differences between people, both physically, mentally, and so on [8], [9]. Driving behavior plays a critical role in the event of traffic accidents [10]. Research shows that driving behavior causes traffic accidents by 74% [11]. According to data from the World Health Organisation, it is evident that motorcyclists constitute a significant proportion, precisely 43%, of the total fatalities in the Southeast Asian region [12]. Driving behavior, especially motorcyclists, is riskier than other modes of transportation [11], [13].

Cite statements Evans [14] and Shinar [9] the influence of human factors on accidents surpasses that of environmental variables (28%) and motor vehicle factors (8%), accounting for over 95% of incidents. Several studies have shown that driver behavior is an important factor contributing to the incidence of traffic accidents [15], [16]. For this reason, several countries have conducted surveys to find out the riding behavior of drivers. In their study, Stephen *et al.* [17] observed that riders generally exhibited safe behaviours, as evidenced by their consistent utilization of safety gear and infrequent engagement in deviant behaviours. Nevertheless, instances of exceeding speed limits and mistakes in motorcycle handling contribute to a higher probability of being involved in near-collisions. Additionally, engaging in stunt behaviour is linked to an elevated possibility of being involved in crashes [17]. There is a strong relationship between the motorcycle rider behaviour questionnaire (MRBQ) factor and accident risk in Vietnam [18].

According to several research, errors and traffic violations have been identified as the primary factors contributing to motorbike [19]–[22]. Therefore, improving safety behavior for two-wheeled riders is urgent. One of the most widely used instruments is the MRBQ. The MRBQ was developed to measure motorcycle-related riding behaviours [23]. The MRBQ documents a rider's reactions in several traffic scenarios, including overtaking, and navigating bends. This tool is employed to ascertain behaviours that increase the probability of road accidents [24]. The initial validation of the motorcycle rider behaviour questionnaire was conducted in high-income countries such as the United Kingdom [23]. MRBQ studies are conducted in developed countries such as Iran [25], Turkey [26], Australia [17], [27], Nigeria [28], and Slovenia [19]. The motorcycle rider behaviour questionnaire has also been translated into several languages, such as Vietnamese [18] and Persian [25]. The latest study was conducted in developing countries such as Malaysia [29], Thailand [30] and Vietnam [18]. Nevertheless, the variability in findings among various research projects underscores the necessity of revising and validating the MRBQ to ensure its conformity and applicability in diverse cultural contexts. Additionally, it is necessary to examine the driving behaviour in low- and middle-income communities and countries that heavily rely on motorcycles.

Regrettably, the availability of statistical data and studies of motorcycle driver behaviour in Indonesia remains restricted. Previous research efforts have focused only on specific driving behaviors, such as wearing a helmet [31], [32]. Using a phone while driving [33]–[36], drowsy driving [37]–[39] and a driver's license [20], [40]. Therefore, this research is motivated by the urgent need for a more comprehensive understanding of driving behavior using MRBQ and addressing motorcycle safety issues in the Indonesian context. Furthermore, the existing literature on the translation, validity tests, and reliability of the MRBQ in the Indonesian language is still scarce. Given the significant prevalence of traffic accidents, it is imperative to investigate driving behavior comprehensively to address the prevailing safety concerns within the Indonesian context. To this end, it is essential to translate and adapt the MRBQ to align with the specific nuances of the Indonesian context. Subsequently, reliability tests and the establishment of the validity of the Indonesian version of the MRBQ must be conducted to ensure the instruments yield accurate and consistent results. This will enable the identification of the MRBQ factors and their association with accident involvement and traffic violations in Indonesia.

## 2. METHOD

### 2.1. Design study and participants

The design of this study is a cross-sectional survey study or data collection at one time to test the validity and reliability of the MRBQ. The validity-reliability study was conducted on university students from several faculties in Central Java, Indonesia, conducted in June 2023 in the same age group (18 to 25 years old) and characteristics (Minimum semester three and maximum semester 4). Letters of permission and proposals containing information about this research were sent to the university and the 12 targeted faculties. Informed consent forms are also shared with participants to ensure no individual names will be reported or mentioned during data analysis and reporting.

The respondents express high confidence in the assurance that the data they furnish will be handled with strict confidentiality. Informed consent was sought from all participants in the study, and written

documentation was collected to confirm their agreement to participate. The study gained ethical approval from the Faculty of Medicine Ethics Commission at Mulawarman University in Samarinda, Indonesia, with certificate number 111/KEPK-FK/VI/2023.

## 2.2. Instrument

The MRBQ, developed by Elliott and colleagues, was served as the primary instrument in this study. This comprehensive questionnaire contained several demographic items such as age, gender, possession of a driving license, as well as the respondents' history concerning involvement in road traffic accidents and violations. The MRBQ's core objective is to evaluate motorcycle-related driving behaviors, encompassing five aspects of risky motorcycle rider behaviour, i.e., violations, control errors, traffic errors, stunts, and protective equipment. These factors include traffic errors, which refer to unintentional mistakes committed by the motorcycle rider. Thirteen control mistakes, specifically related to lapses in motorbike handling, were observed during the study. The dataset consists of seven instances, each representing a case of speed infringement. The study examines twelve items about the execution of stunts, which are actions undertaken to gain thrill. The number of items is reduced to seven, with four items designated for the use of safety equipment [23], [24].

The initial MRBQ consists of a total of 43 items. Each topic prompts respondents to assess the frequency of their riding behavior over the last year by selecting a single choice from a 6-point scale 6-point: 1=never, 2=hardly ever, 3=occasionally, 4=quite often, 5=frequently, and 6=nearly all the time. The results obtained from this study are in line with most previous studies [17], [23], [25]–[27], [41], which found that MRBQ responses were typically between "never" and "almost never". The utilization of this scale demonstrated satisfactory reliability, as evidenced by the Cronbach alpha coefficients for the five factors, which ranged from 0.70 to 0.84 [23]. Next Table 1 the original MRBQ which was adapted to this study.

Table 1. The original motorcycle rider behaviour questionnaire (MRBQ)

Item	Content
1	Fail to notice that pedestrians are crossing when turning into a side street from a main road
2	Not notice someone stepping out from behind a parked vehicle until it is nearly too late
3	Not notice a pedestrian waiting at a crossing where the lights have just turned red
4	Pull onto a main road in front of a vehicle you have not noticed or whose speed you misjudged
5	Miss "Give Way" signs and narrowly avoid colliding with traffic having right of way
6	Fail to notice or anticipate another vehicle pulling out in front of you and had difficulty stopping
7	Queuing to turn left (in England; turn right in other countries) on a main road, you pay such close attention to the mainstream of traffic that you nearly hit the car in front
8	Distracted or pre-occupied, you suddenly realize that the vehicle in front has slowed, and you have to brake hard to avoid a collision
9	Attempt to overtake someone that you had not noticed to be signaling a right turn (in England; left turn in other countries)
10	When riding at the same speed as other traffic, you find it difficult to stop in time when a traffic light has turned against you
11	Ride so close to the vehicle in front that it would be difficult to stop in an emergency
12	Run wide when going around a corner
13	Ride so fast into a corner that you feel like you might lose control
14	Exceed the speed limit on a country/rural road
15	Disregard the speed limit late at night or in the early hours of the morning
16	Disregard the speed limit on a motorway
17	Disregard the speed limit on a residential road
18	Race away from traffic lights with the intention of beating the driver next to you
19	Open up the throttle and just go for it on a country road
20	Ride between two lanes of fast-moving traffic
21	Got involved in racing other riders or drivers
22	Ride so fast into a corner that you scare yourself
23	Attempt or done a wheelie
24	Pull away too quickly and your front wheel lifted off the road
25	Intentionally do a wheel spin
26	Unintentionally do a wheel spin
27	Wear motorcycle riding boots
28	Wear protective trousers leather or non-leather
29	Wear a protective jacket leather or non-leather
30	Wear body armour/impact protection for the elbows and shoulders
31	Wear no protecting clothing
32	Wear motorcycle gloves
33	Wear bright fluorescent strips/patches on your clothing
34	Use daytime headlights on your bike
35	Brake or throttle back (slow down) when going around a bend
36	Change gears when going round a corner or bend
37	Find that you have difficulty controlling the bike when riding at speed (e.g. steering wobble)
38	Skid on a wet road or manhole cover, road making
39	Have trouble with your visor or goggles fogging up
40	Another driver deliberately annoys you or puts you at risk
41	Ride when you suspect you might be over the legal limit for alcohol
42	Wear a full leather-suit
43	Wear bright/fluorescent clothing

### 2.3. Forward translation

The cross-cultural adaptation process uses Beaton guidelines, which consist of several stages: translation, cultural adaptation, and validation of an instrument [42]. The first stage in adaptation is the forward translation. Two translators (T1 and T2) who understood driving safety and were familiar with the terminology were asked to translate a questionnaire from English to Indonesian. Translation by two people is done to avoid choosing one's language style. A translator is a person who understands the culture of speaking English but in the mother tongue of Indonesia. The translation is not done word for word but instead involves understanding the concepts and context of the language and then translating them relevantly. The translation is in short and explicit language. In addition, it also pays attention to the language of questionnaire users, namely lay language, to avoid using jargon or technical terms that are difficult to understand and not used in everyday language. In addition, translators are also required to have an English IELTS test score above 7.5 or TOEFL IBT above 100. The next stage is completed with this T-12 version of the questionnaire.

### 2.4. Backward-translation

The next step involves translating the revised MRBQ questionnaire into English. This translation must be conducted by a translator who has demonstrated English language proficiency with an IELTS test score of at least 7.5 or a TOEFL IBT score of 100 or above. This procedural step is pivotal to the research methodology, aiming to ensure the fidelity of the translation process. The goal of this translation, followed by a retranslation into the questionnaire's original language, is to ensure that the original meaning of the items is fully preserved without any modifications due to linguistic translation.

### 2.5. Content validity by multi-SME (subject matter experts)

The content validity index (CVI) was employed to meticulously evaluate the prioritization, relevance, and linguistic clarity pertaining to the content validity of the questionnaire. Content validity is critically assessed to ascertain the extent to which an item faithfully represents the attribute it purports to measure [43]. In the context of the MRBQ questionnaire, its content validity was rigorously appraised by a panel of three subject matter experts (SMEs), utilizing the content-validity coefficient as proposed by Aiken. This evaluation process involved a detailed examination of the congruence between the questionnaire items and the underlying theoretical framework. The calculation of CVI is based on Aiken's V (1985) theory of content validity, where a minimum CVI value of 0-1 is required for questionnaire items to be considered essential [44]. In this study, the CVI value ranged from 0.58 to 1.00, indicative of substantial content validity, as delineated in Table 2. This quantitative measure serves as a testament to the questionnaire's robust alignment with the theoretical framework, further validating the instrument's relevance and efficacy in measuring the intended constructs.

### 2.6. Pre-testing: validity and reliability test

The data were collected via an online questionnaire. Approximately 60 questionnaires were disseminated, and 40 students (66.6%) participated in the study. After reviewing all the data, three items were excluded due to incomplete data, and a final analysis was performed with 37 participants. The weakness of this study is that the number of samples is small, namely 37 participants, but according by [44], [45] the number of samples should be at least 30 elements or between 30 to 500 elements, therefore this sample is qualified and this amount is ideal for testing questionnaires [42].

The process involves inputting data into a database and employing computer software to analyze continuous and qualitative variables. The data is characterized by descriptive statistics such as mean, standard deviation (SD), and frequency percentage. The Pearson product-moment correlation coefficient will be utilized to assess the construct validity of the total score derived from the MRBQ. According to existing literature, the Indonesian iteration of the MRBQ is considered to have a high level of reliability when the correlation coefficient ( $r$ ) is equal to or greater than 0.75. It is deemed to possess a satisfactory level of reliability when the correlation coefficient falls within the range of 0.5 to 0.7.

Furthermore, the questionnaire is regarded as having a moderate level of reliability when the correlation coefficient ranges from 0.25 to 0.50. Conversely, if the correlation coefficient is less than 0.25, the questionnaire is deemed to have a weak or negligible association. The Cronbach's alpha intraclass coefficient and its corresponding 95% confidence interval (CI) were computed for the complete questionnaire. A Cronbach's alpha value greater than 0.70 is generally considered adequate [46]. A univariate analysis was performed to investigate the variations in the demographic features of the participants in this study. The previous characteristics encompassed age, gender, possession of a driving license, and prior involvement in accidents and road traffic offenses. Furthermore, internal consistency dependability is evaluated using the Cronbach alpha coefficient, as shown in Table 2.

Table 2. This study examines the descriptive characteristics, Cronbach's alpha reliability, and pearson correlation, the content validity index of each data to assess the internal consistency of the Indonesian version of the MRBQ (n=37)

Item	Mean	SD	Variance	r	p-value	Corrected Item/Total Correlation	Cronbach's Alpha if Item Deleted	The content validity index						Σs	V
								Examiner 1		Examiner 2		Examiner 3			
								R	S=R-Lo	R	S=R-Lo	R	S=R-Lo		
Item 1	5.30	0.996	0.992	0.078	0.645*	0.044	0.709	3	2	5	4	2	1	7	0.583
Item 2	4.89	1.022	1.044	0.512	0.001	0.486	0.699	5	4	5	4	4	3	11	0.916
Item 3	4.65	1.495	2.234	0.400	0.014	0.355	0.700	5	4	5	4	4	3	11	0.916
Item 4	4.76	1.065	1.134	0.228	0.174*	0.193	0.706	2	1	4	3	4	3	7	0.583
Item 5	5.14	1.084	1.176	0.564	<0.001	0.538	0.698	2	1	4	3	4	3	7	0.583
Item 6	4.62	0.861	0.742	0.354	0.031	0.328	0.704	5	4	4	3	5	4	11	0.916
Item 7	4.35	1.418	2.012	0.265	0.113*	0.219	0.704	5	4	3	2	5	4	10	0.833
Item 8	3.59	0.985	0.970	-0.224	0.182*	-0.256	0.716	5	4	4	3	5	4	11	0.916
Item 9	4.57	1.144	1.308	0.338	0.041	0.302	0.703	4	3	5	4	4	3	10	0.833
Item 10	4.54	1.304	1.700	0.472	0.003	0.436	0.698	5	4	3	2	4	3	9	0.75
Item 11	4.54	0.931	0.866	0.582	<0.001	0.560	0.699	4	3	5	4	5	4	11	0.916
Item 12	4.49	0.901	0.812	0.580	<0.001	0.559	0.699	4	3	5	4	4	3	10	0.833
Item 13	5.19	0.739	0.547	0.687	<0.001	0.673	0.699	5	4	5	4	5	4	12	1
Item 14	4.41	0.896	0.803	0.620	<0.001	0.601	0.698	5	4	5	4	4	3	11	0.916
Item 15	4.30	1.151	1.326	0.714	<0.001	0.694	0.693	5	4	5	4	5	4	12	1
Item 16	4.46	0.989	0.977	0.600	<0.001	0.578	0.698	5	4	5	4	4	3	11	0.916
Item 17	4.73	0.902	0.814	0.584	<0.001	0.563	0.699	5	4	5	4	5	4	12	1
Item 18	5.11	1.220	1.488	0.597	<0.001	0.569	0.695	4	3	5	4	4	3	10	0.833
Item 19	5	0.972	0.944	0.475	0.003	0.448	0.701	4	3	5	4	4	3	10	0.833
Item 20	4.81	1.101	1.213	0.563	<0.001	0.536	0.697	3	2	5	4	5	4	10	0.833
Item 21	5.54	0.730	0.533	0.445	0.006	0.425	0.703	4	3	5	4	3	2	9	0.75
Item 22	5.27	0.769	0.592	0.644	<0.001	0.628	0.699	4	3	5	4	5	4	11	0.916
Item 23	5.68	0.580	0.336	0.463	0.004	0.447	0.704	4	3	5	4	5	4	11	0.916
Item 24	5.81	0.462	0.213	0.496	0.002	0.484	0.705	4	3	5	4	5	4	11	0.916
Item 25	5.81	0.397	0.158	0.245	0.144*	0.232	0.708	5	4	5	4	5	4	12	1
Item 26	5.65	0.633	0.401	0.358	0.030	0.339	0.705	5	4	5	4	5	4	12	1
Item 27	1.51	0.768	0.590	-0.072	0.670*	-0.99	0.712	5	4	5	4	5	4	12	1
Item 28	2.92	1.341	1.799	-0.155	0.359*	-0.200	0.717	5	4	5	4	5	4	12	1
Item 29	3.11	1.430	2.044	0.160	0.344*	0.112	0.708	5	4	5	4	5	4	12	1
Item 30	1.62	0.721	0.520	-0.044	0.797*	-0.069	0.711	5	4	5	4	5	4	12	1
Item 31	4.08	1.460	2.132	0.165	0.330*	0.115	0.708	5	4	5	4	5	4	12	1
Item 32	3.78	1.109	1.230	0.255	0.127*	0.219	0.705	5	4	5	4	5	4	12	1
Item 33	1.57	0.689	0.474	-0.023	0.893*	-0.047	0.710	5	4	5	4	5	4	12	1
Item 34	4.22	1.766	3.119	0.051	0.764*	-0.010	0.712	5	4	4	3	5	4	11	0.916
Item 35	5.16	1.014	1.029	0.597	<0.001	0.574	0.697	5	4	5	4	5	4	12	1
Item 36	5.27	1.097	1.203	0.459	0.004	0.428	0.700	4	3	5	4	4	3	10	0.833
Item 37	4.59	1.013	1.026	0.515	0.001	0.489	0.699	5	4	5	4	5	4	12	1
Item 38	4.95	0.998	0.997	0.466	0.004	0.439	0.701	5	4	5	4	4	3	11	0.916
Item 39	3.97	1.590	2.527	0.343	0.038	0.294	0.701	5	4	5	4	5	4	12	1
Item 40	4.30	1.266	1.604	0.226	0.178*	0.184	0.706	5	4	5	4	5	4	12	1
Item 41	5.84	0.442	0.195	0.349	0.034	0.336	0.706	4	3	5	4	4	3	10	0.833
Item 42	1.97	0.928	0.860	-0.152	0.368*	-0.183	0.714	4	3	5	4	5	4	11	0.916
Item 43	3.05	1.201	1.441	0.003	0.987*	-0.038	0.712	5	4	5	4	5	4	12	1
Total Score	189.11	14.514	210.655	1	-	1.000	0.790								

### 3. RESULTS AND DISCUSSION

There were 11 males and 26 females with an average age of  $19.86 \pm 1.273$  and a range of 18 to 25 years. Most students (29.7%) said they did not have a driver's license, and (70.3%) students did have one. The results showed that some respondents stated that they did not have a driving license; therefore, researchers will conduct further research related to institutional policies and regulations that require students to have a driving license in the campus area and educate them about the importance of having a driving license and its consequences, traffic rules and responsibilities, to help increase student awareness. In addition to other inquiries, participants were queried about their prior involvement in traffic accidents. It was found that 8.1% of university students acknowledged being engaged in such incidents. According to the survey findings, most pupils, precisely 91.9%, reported no prior involvement in vehicle accidents. Students stated that they had traffic violations in the last twelve months, as much as 21.6%.

The findings of the validity test may be found in Table 2, which displays the overall mean value of MRBQ as 189.11. All items in the study exhibit satisfactory levels of dependability, as indicated by Cronbach's

alpha coefficients ranging from 0.693 to 0.72. While the overall reliability is 0.742, Cronbach's alpha value  $>0.70$  is categorized as good/satisfactory. The validity of items obtained ranges  $<0.001$  (min) to 0.987 (max). There are 16 invalid items (1, 4, 7, 8, 25, 27, 28, 29, 30, 31, 32, 33, 34, 40, 42, and 43), and are 27 items left in the Indonesian version of MRBQ. The Indonesian version of MRBQ can be seen in Table 3.

The conclusive outcomes The Indonesian version of the MRBQ has undergone translation into Indonesian. After being adapted and cross-cultural into Indonesian, the Indonesian version of the MRBQ was then validated and tested for reliability, with a 6-point scale: 1=never, 2=hardly ever, 3=occasionally, 4=quite often, 5=frequently, and 6=nearly all the time. The results of the adaptation, cross-cultural and validity and reliability tests of the MRBQ as shown in Table 3.

Table 3. The Indonesia version of the motorcycle rider behaviour questionnaire (MRBQ)

Item	Indonesian version question	Original version question
1	<i>Tidak melihat seseorang melangkah keluar dari belakang kendaraan yang diparkir sampai hampir terlambat berhenti</i>	Fail to notice that pedestrians are crossing when turning into a side street from a main road
2	<i>Tidak memperhatikan ada pejalan kaki menunggu di penyeberangan saat lampunya baru saja berubah menjadi merah</i>	Not notice a pedestrian waiting at a crossing where the lights have just turned red
3	<i>Tidak memperhatikan rambu "STOP" saat akan melintasi jalur utama dan nyaris bertabrakan dengan kendaraan lain yang berada di jalur yang benar</i>	Miss "Give Way" signs and narrowly avoid colliding with traffic having right of way
4	<i>Gagal menyadari atau mengantisipasi kendaraan lain yang berhenti mendadak di depan Anda dan mengalami kesulitan berhenti</i>	Fail to notice or anticipate another vehicle pulling out in front of you and had difficulty stopping
5	<i>Anda Mencoba menyalip kendaraan lain yang Anda tidak sadari memberi isyarat belok kiri.</i>	Attempt to overtake someone that you had not noticed to be signaling a right turn (in England; left turn in other countries)
6	<i>Saat berkendara dengan kecepatan yang sama dengan lalu lintas lainnya, Anda merasa sulit untuk berhenti pada saat lampu lalu lintas telah berubah menjadi merah</i>	When riding at the same speed as other traffic, you find it difficult to stop in time when a traffic light has turned against you
7	<i>Jarak berkendara begitu dekat dengan kendaraan di depan sehingga akan sulit untuk berhenti dalam keadaan Darurat</i>	Ride so close to the vehicle in front that it would be difficult to stop in an emergency
8	<i>Mengambil putaran terlalu lebar saat berbelok di tikungan</i>	Run wide when going around a corner
9	<i>Berkendara begitu cepat ditikungan sehingga Anda merasa seperti kehilangan kendali</i>	Ride so fast into a corner that you feel like you might lose control
10	<i>Melebihi batas kecepatan di jalanan</i>	Exceed the speed limit on a country/rural road
11	<i>Mengabaikan batas kecepatan saat larut malam atau dini hari</i>	Disregard the speed limit late at night or in the early hours of the morning
12	<i>Mengabaikan batas kecepatan di jalan raya</i>	Disregard the speed limit on a motorway
13	<i>Mengabaikan batas kecepatan di jalan pemukiman</i>	Disregard the speed limit on a residential road
14	<i>Balapan dimulai saat lampu lalu lintas menunjukkan warna hijau dengan tujuan mengalahkan pengemudi berikutnya.</i>	Race away from traffic lights with the intention of beating the driver next to you
15	<i>Di jalanan kecil, Anda berkendara dengan kecepatan lebih dari 60 km/jam</i>	Open up the throttle and just go for it on a country road
16	<i>Berkendara di dua jalur lalulintas dengan kecepatan tinggi</i>	Ride between two lanes of fast-moving traffic
17	<i>Terlibat dalam balapan dengan pengendara atau pengendara lain</i>	Got involved in racing other riders or drivers
18	<i>Berbelok dengan kecepatan tinggi sehingga Anda merasa takut</i>	Ride so fast into a corner that you scare yourself
19	<i>Mencoba mengangkat roda depan kendaraan Anda</i>	Attempt or done a wheelie
20	<i>Tarik gas terlalu cepat dan roda depan Anda terangkat dari jalan</i>	Pull away too quickly and your front wheel lifted off the road
21	<i>Secara tidak sengaja melakukan putaran roda</i>	Unintentionally do a wheel spin
22	<i>Rem pelan-pelan saat mengitari tikungan</i>	Brake or throttle back (slow down) when going around a bend
23	<i>Ganti persneling/menurunkan kecepatan saat berbelok di tikungan atau tikungan</i>	Change gears when going round a corner or bend
24	<i>Anda mengalami kesulitan mengendalikan sepeda motor saat berkendara dengan kecepatan tinggi</i>	Find that you have difficulty controlling the bike when riding at speed (e.g. steering wobble)
25	<i>Tergelincir di jalan basah atau penutup lubang got, pembuatan jalan</i>	Skid on a wet road or manhole cover, road making
26	<i>Mengalami masalah dengan pelindung atau kaca mata Anda yang berkabut</i>	Have trouble with your visor or goggles fogging up
27	<i>Berkendara dalam kondisi dibawah pengaruh alkohol</i>	Ride when you suspect you might be over the legal limit for alcohol

As one of the measuring instrument items, the questionnaire must be valid and reliable. Validity measures what is supposed to be measured, which describes the extent to which the data collected covers that area of actual research and its expression to what extent the measurement measures something it should measure. Reliability is measuring a phenomenon and ensuring stable and consistent results, and the achievement of the results obtained and measurement measures can be replicated [47]–[49].

Several studies use MRBQ to identify factors that influence motorcyclist behavior. Principal component analysis (PCA) was employed to categorize factor models encompassing several aspects such as traffic errors, control errors, speed violations, stunt performance, and utilization of safety equipment. In total, the factor models

consisted of 43 question items. Research by Özkan *et al.* [26] The implementation of the MRBQ system for Turkish residents encompasses various factors, including traffic faults, control errors, speed violations, stunt appearance, and adherence to safety equipment usage. The research revealed a significant positive link between annual miles and rider accidents in active and passive accidents and violations.

In contrast, rider age exhibited a comparatively weaker correlation with these incidents. Reckless behavior primarily contributes to accidents and violations, with speeding offenses prominent in traffic-related infractions. Sakashita *et al.* [27] the MBRQ was administered to a novel cohort of drivers in Australia. Confirmatory factor analysis (CFA) ensures the sample group's suitability. Control errors, speeding offenses, stunts, and protective equipment are factors subject to factor adjustment. Other studies by Stephens *et al.* [17] investigated the association between the MRBQ and vehicular accidents in Australia. The research revealed that drivers actively employ safety devices and avoid engaging in hazardous activities. While speeding offenses and control errors are infrequent, a correlation exists between these factors and the probability of accidents. Moreover, behaviors associated with doing stunts contribute to the heightened likelihood of accidents.

The reliability of the indicator was assessed using Cronbach's alpha, with a minimum threshold of 0.7, indicating acceptable accuracy [50]. The test score above the threshold of 0.7 indicates that the MRBQ Indonesia version has favorable psychometric qualities characterized by sufficient levels of validity and reliability. This tool can assess the MRBQ among university students. Similar to this study, Bui *et al.* MRBQ adapted into Vietnamese can be applied and helps assess the relationship between age, sex, and MRBQ factors and the risk of accidents and traffic violations easily [18]; the MRBQ adopted in Persian is also a suitable measure for studying motorcyclists' behavior [25], the MRBQ questionnaire, a widely recognized assessment tool, was employed to evaluate the behavioral attributes of motorcyclists to their susceptibility to accidents [41], the risk of motorcyclist accidents in Australia can be known using MRBQ [17], the MRBQ demonstrates a distinct factor structure, with robust item loadings and satisfactory internal consistency observed in a different cultural context [26]. Nevertheless, the research of Sakashita *et al.* demonstrates that the internal consistency, stability, content, and predictive validity of the MRBQ exhibit inadequacies or inconsistencies across the three MRBQ studies. This implies that further development and refinement of MRBQ items are imperative before extensively utilizing MRBQ instruments, particularly among inexperienced riders [27].

#### 4. CONCLUSION

The motorcycle rider behaviour questionnaire (MRBQ) Indonesian is an established tool for assessing Motorcycle Rider Behaviour. It has been validated and can be effectively utilized within the national program to identify driving safety behavior in Indonesia. We advocate for the implementation of this instrument within the Indonesian context. Modifying and incorporating indigenous terminology is advisable, considering the diverse range of cultures.

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