


Impact of Masculine Identity on Racing Engagement Among Young Motorcyclists in Penang, Malaysia



Zalmizy Hussin^{1*} and Siti Rohana Ahmad² 

¹School of Applied Psychology, Social Work and Policy, College of Arts & Sciences, Universiti Utara Malaysia, Sintok 06010, Kedah Darul Aman, Malaysia

²Kedah State Health Department, Ministry of Health Malaysia, Malaysia

Abstract:

Background: Illegal motorcycle racing has become increasingly prevalent among young individuals as a means of seeking excitement and self-expression. This research aimed to explore the prevalence of self-perceived illegal motorcycle racers and the impact of masculine identity on their participation in racing activities.

Methods: This cross-sectional study was conducted from November 2020 to January 2021. Participants completed self-administered questionnaires, including the Conformity to Masculine Norms Inventory-22 (CMNI-22), to measure masculine identity levels. Multiple logistic regression was used to determine the association between masculine identity and participation in illegal racing.

Results: A total of 400 individuals with a mean age of 18.5 years (SD ± 13.4) participated in the study. The average duration of engagement in street racing was 1.3 years (SD ± 1.13). Among the participants, 57.5% identified themselves as active racers, while the remaining 42.5% either observed the races or took part in convoys exclusively. The mean score for masculine identity was 31, with scores ranging from 21 to 45.2. The results showed that participants with high levels of masculine identity were four times more likely to engage in racing (95% confidence interval (CI) 3.57, 6.12; P = 0.001) compared to those with low levels of masculine identity.

Conclusion: Promoting positive masculinity through education, engagement in safe activities, and highlighting role models with qualities like kindness and responsibility may help foster healthy behaviours and well-being among youth.

Keywords: Masculine identity, Racing engagement, Aggressive behaviour, Illegal racers, Young motorcyclists, Motor cycle racing.

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*Address correspondence to this author at the School of Applied Psychology, Social Work and Policy, College of Arts & Sciences, Universiti Utara Malaysia, 06010 Sintok, Kedah Darul Aman, Malaysia; E-mail: zalmizy@gmail.com

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1. INTRODUCTION

Illegal motorcycle racing has become increasingly prevalent, particularly among young individuals, as a means of seeking excitement and self-expression [1, 2]. This rising trend in motorcycle racing carries significant societal costs. Street racing has been recognized as a threat to civil society for a considerable period, leading to

substantial social and economic consequences [3, 4]. Not only does it jeopardize the safety of other road users, but it also creates unnecessary disturbances for the public. The reckless behaviours exhibited during these races not only endanger the participants but also put innocent bystanders at risk. Additionally, the noise, disruption, and potential for accidents associated with street racing can

severely impact the quality of life in affected communities [5, 6].

In Malaysia, a vibrant subculture of illegal motorcycle racing, commonly referred to as 'Mat Rempit,' has emerged among certain segments of the youth population (ages 13-16). These individuals, who are active racers, often participate in races using small motorcycles that frequently lack essential safety precautions. Many of these motorcycles have been modified to achieve higher speeds or to create louder exhaust noises, deviating from standard specifications. Mat Rempits typically ride in large groups and conduct their races on public roads, posing significant risks to other motorists. Apart from racing, they navigate through traffic by executing perilous motorcycle stunts, including their renowned 'Superman' maneuvers. They are also infamous for their high-speed weaving, known as 'Cilok' between moving vehicles [7]. Additionally, a distinct group of young individuals often joins these events as part of other street gangs, usually serving as bystanders rather than active participants.

Studies consistently demonstrate that involvement in illegal racing is linked to various factors, including youth, gender roles, limited education, low socioeconomic status, thrill-seeking tendencies, peer pressure, cultural and social norms, financial incentives, and religious disconnection [8-10]. Young individuals are more susceptible to participating in illegal racing due to impulsiveness and a lack of consideration for consequences [11, 12]. Pressure from peers and the fear of social exclusion can compel them to join races, even against their better judgment [13]. Individuals with lower educational backgrounds may turn to illegal racing as they have limited access to alternative forms of entertainment, drawing them toward risky activities [14, 15]. Similarly, those from disadvantaged socioeconomic backgrounds, dealing with restricted resources and opportunities, find solace in the excitement of illegal racing [16, 17].

Moreover, residing in areas characterized by high crime rates and gang activities exposes them to this underground sport. Children from troubled family structures or broken families are more likely to engage in risky behaviours like illegal racing due to the absence of parental supervision and guidance. Racing can also serve as an escape from problems at home [18-20]. The use of prohibited substances, such as drugs and alcohol, constitutes a well-documented risk factor associated with reckless behaviour, including participation in dangerous racing activities [21-23]. Substance abuse impairs judgment, lowers inhibitions, and heightens impulsivity, making young motorcyclists more inclined to engage in risky racing behaviours like high-speed racing [24, 25].

Furthermore, peer groups and social circles where substance abuse is prevalent can further increase the likelihood of participating in high-speed racing [26, 27]. Young motorcyclists lacking religious or spiritual affiliations may lack moral constraints, potentially increasing their involvement in perilous racing activities. Religious teachings emphasize ethical conduct, making those strongly affiliated less prone to engaging in

conflicting behaviours. During times of health challenges, individuals often turn to their religious or spiritual beliefs for comfort, hope, and resilience [28, 29].

Cultural and social norms play a significant role in perpetuating illegal racing, particularly in societies where it symbolizes masculinity and toughness. The desire to prove one's masculinity through displays of reckless driving and competition with other male drivers appears to be a central motivating factor for many individuals who participate in illegal street racing [30, 31]. Emerging research has identified masculinity and conformity to traditional male gender norms as a significant risk factor for dangerous driving behaviours, including participation in illegal street racing [32-34]. Studies utilizing validated measures of masculine norms, such as the Conformity to Masculine Norms Inventory (CMNI), have demonstrated a strong link between the endorsement of masculine ideals and the propensity to engage in unlawful high-speed driving [35, 36].

However, the existing studies have primarily focused on car-based illegal racing, and there is less research specifically examining the dynamics of illegal motorcycle racing. Motorcycles may introduce some unique social and cultural considerations that could influence the motivations and behaviors of participants. For example, the thrill-seeking and risk-taking associated with motorcycle riding may attract individuals who are already inclined towards hypermasculine self-expression [37]. The physical skill and bravery required to handle a high-powered motorcycle at high speeds could also serve as a means for some riders to demonstrate their masculinity. Additionally, motorcycle subcultures may have their own distinct social norms and values that could shape the attitudes and behaviors around illegal racing. The motorcycle enthusiast community often places a strong emphasis on ideals like freedom, independence, and the "rebel" image, which could intersect with masculine norms in ways that encourage reckless riding [38, 39].

Limited research exists on the relationship between masculinity and motorcycle racing, creating a gap in the literature. A previous study investigated the factors associated with illegal street racing, known as "Mat Rempit," among young motorcycle riders in Malaysia. The study focused on sociodemographic characteristics and risky behaviors, finding high prevalence rates of cigarette smoking (78.3%), alcohol use (27.8%), and recreational drug use (18.8%) among the participants. Importantly, the study reported that masculinity scores were positively correlated with risky behavior scores and inversely related to health-protective behavior scores [8].

Building on this prior work, the current study aimed to further explore the prevalence of self-reported illegal motorcycle racing and the impact of masculine identity on participation in these racing activities. This study proposes that, in addition to the many other risk factors characterizing individuals involved in illegal racing, a strong masculine identity may be a key explanation for engaging in these dangerous behaviors, even when controlling for other sociodemographic and racing-related factors.

Compared to the LP Wong study, the current research utilized the Conformity to Masculine Norms Inventory (CMNI) to provide a more comprehensive assessment of masculinity among the respondents. By offering empirical insights from a non-Western cultural context, this study has the potential to enhance the current understanding of the intersection between motorcycle racing and masculine identity. The findings hold practical significance for policymakers, practitioners, and educators seeking to improve road safety and prevent motorcycle-related injuries, particularly among young men. Furthermore, the study carries theoretical implications for scholars interested in comprehending the relationship between gender and leisure in contemporary society.

2. METHODS

2.1. Study Design and Location

This research employed a cross-sectional design to examine the impact of masculine identity on the involvement of young motorcyclists in racing activities in Penang. The study was carried out between November 2020 and March 2021 in Penang, a state located on the northwest coast of Peninsular Malaysia. Penang is notorious for its high occurrence of illicit motorcycle racing events, which have contributed to public disturbances and safety issues [40].

2.2. Sample Size and Sampling

The sample was selected through the utilization of the snowball sampling technique, which is a well-established method for sampling populations that are challenging to reach due to the ethical, legal, and social sensitivities associated with the behaviour under investigation. This technique relies on referrals from initial participants to identify additional participants. The sample size was not predetermined because the exact number of illegal motorcycle racers in the country was unknown.

2.3. Sampling Recruitments and Data Collection

In researching illegal motorcycle racing, the study faced challenges in accessing the elusive population of racers. To overcome this, the researchers identified key figures within the illegal motorcycle racing community by attending racing events and collaborating with law enforcement. The goal was to establish connections with these target groups and their environments. The identified leaders were individually contacted and invited to participate in the research. They were informed about the research inclusion criteria, which included:

- 1) Engaging in illegal motorcycle street racing at the time of the interview.
- 2) Being men and Malay.
- 3) Aged between 13 and 30 years (13 years old is considered the age a person can ride a motorcycle)
- 4) Willingness to provide informed consent.

Notably, participants lacking proficiency in reading and writing Malay were excluded. Proficiency in Malay was crucial for understanding study materials, completing

questionnaires, and participating in activities requiring written or spoken communication. This approach enhanced the study's internal validity by ensuring a common language of communication among all participants. Subsequently, appointments were arranged for the leaders and their teams to meet with the researcher. During these sessions, participants were briefed on the study's objectives and asked to sign an informed consent form. They were assured of confidentiality, and their voluntary participation was emphasized. For participants under 18 years old, additional measures secured informed consent from both participants and their legal guardians. The data collection process involved self-administered questionnaires, resulting in an impressive response rate of 96% (418 out of 400 participants). Data collection occurred from November 2020 to January 2021. As a token of gratitude, each leader received monetary compensation of RM 50, while individual participants received RM 20. Importantly, participants retained the prerogative to withdraw from the study without facing penalties or adverse consequences.

To minimize information and recall bias, the interviews were conducted in settings recommended by the leaders. Time was spent building rapport with the respondents to make them feel comfortable and more likely to provide honest responses. It was clearly communicated that their responses would remain confidential and not be linked to their identities.

3. MATERIALS

The study participants were administered a paper survey questionnaire consisting of three parts. The first part gathered socio-demographic information, details about their engagement in illegal motorcycle racing, and violent tendencies. The socio-demographic information included age, educational level, working status, household income, locality, type of residence, living arrangements, problematic family structure (divorced parents), and self-declaration of lack of religious affiliation. The racing information included participation in illegal races, duration involved as a racer, frequency of racing, possession of a valid driving license, motorcycle modifications for speed, appearance, and performance, engagement in performing dangerous stunts or manoeuvres, history of disregarding traffic laws, and history of facing legal consequences. The violent tendencies included their involvement in aggressive behaviours, such as drinking alcohol, intake of prohibited substances, drug addiction, vandalism, bullying, fighting, gambling, and stealing.

The second part contained an inventory that evaluated masculine identity based on the Conformity to Masculine Norms Inventory - 22 (CMNI-22). It is a short-form version of the original 94-item Conformity to Masculine Norms Inventory (CMNI). It is a self-report questionnaire that measures the extent to which individuals conform to traditional masculine norms, such as primacy of work, dominance, risk-taking, heterosexual presentation, emotional control, winning, power over women, pursuit of

status, violence, playboy, and self-reliance. The CMNI-22 consists of 22 items, each of which is rated on a 4-point Likert scale from 0 (strongly disagree) to 3 (strongly agree). The total score is calculated by summing the scores for all 22 items. Higher scores indicate a higher conformity to masculine norms. The internal consistency of the scale is high (Cronbach's alpha = 0.869). Using the short-form version of the CMNI is advantageous because it includes the strongest questions from the full scale and is less time-consuming, taking only about 90 seconds to complete, according to peer-reviewed reports [32].

The CMNI has been employed in diverse research to explore how masculinity is connected to different outcomes, encompassing mental and physical health [41]. Research indicates that elevated CMNI scores are linked to adverse mental and physical health conditions, including depression, anxiety, substance abuse, and cardiovascular disease. Moreover, higher CMNI scores have been correlated with heightened aggression and violence in men. Additionally, studies have found that CMNI scores are inversely related to academic success in boys and young men [42-44].

3.1. Data Analysis

The data obtained were then analysed using Statistical Package for the Social Sciences (SPSS) version 26. The socio-demographic, racing, and aggressive behaviours information were tabulated. Multiple Logistic Regression analysis was used to demonstrate the association between the masculine identity group (low and high) and racing involvement (racer involvement/convoy only). Simple logistic regression (SlogR) was used to screen a selection of variables, and variables with a p-value of less than 0.25 from the univariable analysis were selected for Multiple Logistic Regression (MlogR), where predictors were estimated by determining the Odds Ratio (OR). The variables of less than 0.25 were problematic family structure, lack of religious nature, frequency of racing, history of disregarding the law, history of drinking, and intake of prohibited substances. An OR was considered significant if 95% of the confidence interval (CI) did not cross 1.0 and the p-value was less than 0.05. Variance Inflation Factor (VIF) was also used to check for multicollinearity, where values less than ten were considered acceptable and indicated no multicollinearity. The fitness of the model was assessed using the Receiver Operator Characteristic (ROC) curve and the Hosmer and Lemeshow goodness-of-fit test. A p-value greater than 0.05 and an area under the curve value of 0.7 indicated a good fit. Finally, the enter method was employed to determine the final model, where a 95% confidence interval, Wald statistics, OR, and p-value of less than 0.05 were used.

3.2. Ethical Consideration

This study involved participants under the age of 18 who were involved in illegal racing. Given the sensitive nature of the study, obtaining informed consent from the participants' guardians was a critical ethical consideration. First, we developed comprehensive consent materials, including a detailed consent form that covered

the following aspects: Purpose of the study, study procedures, risks and benefits, confidentiality measures, voluntary participation, and contact information of the investigator. Then, we arranged individual consent meetings with the guardians. These meetings were conducted *via* video call, during which we explained the study in detail, including its purpose, procedures, risks, and benefits. Guardians were given adequate time to review the consent form and discuss it with their child. Once they felt comfortable and fully informed, they were asked to sign the consent form. A copy of the signed consent form was provided to the guardians for their records.

4. RESULTS

This study aimed to examine the prevalence of self-reported illegal motorcycle racing and the impact of masculine identity on participation in these racing activities. This study proposes that in addition to the many other risk factors characterizing individuals involved in illegal racing, a strong masculine identity may be a key explanation for engaging in these dangerous behaviors, even when controlling for other sociodemographic and racing-related factors. As seen in Tables 1 and 2, a significant portion of participants (57.5%) identified themselves as active racers, while the remaining 42.5% were either bystanders or participated in convoys only.

Looking into the socio-demographic background of the 400 participants, Table 1 shows the frequency and percentage of participants for various variables. The age range of the participants was 14 to 29 years, with the highest percentage (65.0%) falling within the 18 to 21 age group. In terms of education level, most participants (62.5%) had completed lower secondary education, followed by 26.5% who had completed higher secondary education. Regarding working status, 50% of the participants were students, followed by 18% who worked as mechanics and 14.5% who worked in factories. The household income of the participants ranged from below RM 1000 to above RM 4000, with 64.5% falling within the range of RM 1000-4000. Regarding locality, 76% of the participants lived in rural areas. The most common type of residence was a rented house (28.25%), followed by a terrace house (30.75%). In terms of living arrangements, many participants (83.8%) lived with their families. The table also provides information on family problems and lack of religious/spiritual nature. A total of 73.75% of participants reported that they came from broken divorced parents, and 78.75% reported a lack of religious/spiritual nature.

The duration of involvement as an illegal racer was 1.3 years. When examining the frequency of racing, 44% reported racing very often or often, while 13.5% indicated they rarely engaged in such activities. The possession of a valid driving license was reported by 27% of the respondents, while a substantial 73% did not possess one. In terms of motorcycle modification, 54% had modified their motorcycles, with the remaining 46% sticking to standard configurations. Notably, 57.5% of the respon-

dents admitted to performing dangerous stunts or manoeuvres, whereas 42.5% claimed not to engage in such activities. Most of the respondents (59.75%) acknowledged a history of disregarding traffic laws, while

40.25% reported abiding by traffic laws. Additionally, 57.5% of the respondents indicated a history of facing legal consequences, with 42.5% reporting no such history.

Table 1. Socio-demographic background of participants (n = 400).

Variables	Frequency (%)
Age (years)	
14-17	50 (12.5)
18-21	260 (65.0)
22-29	90 (22.5)
Education level	
Primary school	44 (11.0)
Lower secondary	250 (62.5)
Higher secondary education	106 (26.5)
Working status	
Mechanics	72 (18.0)
Unemployed	28(7.0)
Students	200 (50.0)
Food Conveyor	58 (14.5)
Factory workers	42 (10.5)
Household income (RM)	
Below 1000	50 (12.5)
1000-4000	258 (64.5)
Above 4000	92 (23.0)
Locality	
Urban	96 (24.0)
Rural	304 (76.0)
Type of Residence	
Rented house	113 (28.25)
Terrace house	123 (30.75)
Apartment house	45 (11.25)
Village house	119 (29.75)
Living with	
Peers	65(16.3)
Family	335(83.8)
Problematic Family Structure	
Yes	295 (73.75)
No	105 (26.25)
Lack of Religious/Spiritual Nature	
Yes	315 (78.75)
No	85 (21.25)

Table 2. Racing activities among participants (n = 400).

Variables	Frequency (%)
Racing involvement	
Racer	230 (57.5)
Convoy only/bystander	170 (42.5)
Duration involved (years) as a racer	Mean (SD) 1.3 (1.13)
Frequency of racing	
Very often/often	176 (44.0)
Rarely	54 (13.5)
Valid driving licence	
Yes	108 (27.0)
No	292 (73.0)
Motorcycle modification	
Modify	216 (54.0)
Standard	184 (46.0)
Performing dangerous stunts or manoeuvres	
Yes	230 (57.5)
No	170 (42.5)
History of disregarding traffic laws	
Yes	239 (59.75)
No	161 (40.25)

(Table 4) contd....

Variables	Frequency (%)
History of facing legal consequences	
Yes	230 (57.5)
No	170 (42.5)

Table 3. Involvement in aggressive behaviour (n = 186).

Variables	Frequency (%)
Drinking	-
Yes	120 (30.0)
No	66(70.0)
Intake prohibited substance	-
Yes	118 (29.5)
No	62(70.5)
Drug addiction	-
Yes	23 (5.75)
No	163(94.25)
Vandalism	-
Yes	139 (74.73)
No	47(25.27)
Bullying	-
Yes	150 (37.5)
No	36 (62.5)
Fighting	-
Yes	130 (69.9)
No	56(30.1)
Gambling	-
Yes	10 (5.4)
No	176(94.6)
Stealing	-
Yes	98 (52.7)
No	88(47.3)

Among the participants surveyed, it is evident that 186 engaged in risky and aggressive behaviors (Table 3). Drinking was reported by 30% of them, while the intake of prohibited substances was close behind at 29.5%. A smaller but still concerning percentage, 5.75%, admitted to drug addiction. The data on acts of vandalism were particularly alarming, with a vast majority of 74.73% reporting involvement in such destructive actions. Additionally, bullying was found to be a pervasive issue among this group, as 37.5% of the respondents acknowledged participation in this harmful behavior. Fighting was reported by a high percentage of 69.9%, indicating that physical altercations are relatively common. Gambling and stealing were reported at lower percentages, 5.4% and 52.7%, respectively, but they still highlight the presence of problematic behaviors within this population. The mean score for masculine identity among the 400 participants was 31, with scores ranging from a low of 21 to a high of 45.2 (Table 4). Participants were categorized into two groups: the "low masculine identity group" (n = 179) with mean scores less than 31, and the "high masculine identity group" (n = 221) with mean scores of 31 or higher.

In simple logistic regression, the factors that had p-value less than 0.25 were high masculine identity score, problematic family structure, lack of religious nature,

frequency of racing (often), history of disregarding the law, history of drinking, and intake of the prohibited substance. However, after adjusting the high masculine identity score with the variables in multiple logistic regression, only the high masculine identity group, having problematic family structure, lack of religious nature, and intake of prohibited substances, were found to be significant in the final model ($p < 0.05$).

Notably, participants in the high masculine identity group were four times more likely to engage in motorcycle racing compared to those in the low masculine identity group, and this association was found to be statistically significant. The other significant factors were lack of religious spirituality, problematic family structure, and intake of prohibited substances. Approximately 84.2% of items were correctly classified, and there was no evidence of multicollinearity. The model was deemed to be a good fit, as indicated by a Hosmer and Lemeshow test p-value of 0.251 and an ROC curve value of 94%.

In the stratified analysis logistic model comparing the age groups, the high masculine identity factor was not significant in the 14 to 17 age group (Table 5) but significant in the 18 to 21 years group. The problematic family structure and the highly masculine group were found to be significant in the 22 to 29 age group ($p < 0.01$).

Table 4. Association between masculine identity group and participation in illegal racing (illegal racing status) among participants (n = 400).

Variable	Crude OR ^a (95%CI)	Adjusted OR ^b (95% CI)	Wald Statistic ^b	p-value ^b
High masculine identity group	3.14 (3.05, 4.41)	4.21(3.57, 6.12)	10.15 [1]	0.001
Lack religious spiritual	1.32 (1.19, 1.62)	2.31(1.27, 3.11)	7.84 [1]	0.002
Problematic family structure	2.24 (1.56, 2.65)	2.39 (1.83, 3.03)	9.01 [1]	0.014
Intake of prohibited substances	4.11(3.11, 5.05)	5.01(4.72, 6.02)	10.12 [1]	0.019

Notes: ^aSimple logistic regression ^bMultiple Logistic Regression.

Table 5. Association between masculine identity group and participation in illegal racing (illegal racing status) among participants age group 14-17 years old (n = 50).

Variable	Adjusted OR ^b (95% CI)	Wald Statistic ^b	p-value ^b
High masculine identity group	2.58 (0.57, 6.12)	0.48 [1]	0.485
Lack religious spiritual	1.42 (0.91, 3.11)	0.18 [1]	0.402
Problematic family structure	2.3 (0.93, 3.21)	0.71 [1]	0.770
Intake of prohibited substances	0.72 (0.32, 2.02)	0.79 [1]	0.765

5. DISCUSSION

The findings of this study provide insights into the socio-demographic backgrounds and racing activities of young motorcyclists engaged in illegal racing in Malaysia. A significant proportion of the participants fell within the 18 to 21 age group, with most having lower secondary education. Participants with lower levels of education exhibited a heightened propensity for engaging in illegal activities, primarily attributed to restricted employment prospects and less social capital. Within this demographic figure, a higher rate of school dropouts amplified the risk of delinquent behaviour. Most of the participants lived with their families, residing in rural areas, with household incomes ranging from less than RM 1000 to over RM 4000. This indicates that, like those involved in car racing, most of the illegal motorcycle racers were also from lower socio-economic backgrounds [45].

Participants hailing from lower socioeconomic backgrounds may turn to illicit activities, such as motorcycle racing, in their pursuit of income or status. Moreover, their increased likelihood of residing in high-crime areas further accentuates the risk of their involvement in such riding behaviours [46, 47].

Additionally, 73.75% of participants had divorced parents, and 78.75% reported a lack of religious or spiritual affiliation. It is also worth noting that children from divorced families are more likely to engage in risky behaviours, such as substance abuse, delinquency, and criminal activity. This may be due to several factors, including the stress and instability associated with divorce, as well as the lack of parental supervision and support. Similarly, people who lack religious or spiritual affiliation are more likely to engage in risky behaviours. This may be because religion and spirituality can provide people with a sense of purpose, meaning, and morality, which can deter them from engaging in harmful activities.

Often, research in this area reveals that family-related problems or unstable family structures can be contributing factors to participation in illegal activities, including motorcycle racing. These problems may include issues, such as broken families, lack of parental supervision, or strained relationships, which can influence a young person's choices and behaviours.

Regarding racing activities, 57.5% of participants identified themselves as active racers, while the remaining 42.5% were either bystanders or participated in convoys only. The duration of involvement as an illegal racer was 1.3 years. About 44% reported racing very often or often, while 13.5% indicated they rarely engaged in such activities. About 27% of the respondents possessed a valid driving license, while a substantial 73% did not possess one. About 54% had modified their motorcycles, with the remaining 46% sticking to standard configurations. In comparison, 57.5% of the respondents admitted to performing dangerous stunts or manoeuvres, whereas 42.5% claimed not to engage in such activities. A majority of the respondents (59.75%) acknowledged a history of disregarding traffic laws, while 40.25% reported abiding by traffic laws. About 57.5% of the respondents indicated a history of facing legal consequences, with 42.5% reporting no such history.

The substantial number of participants involved in active racing and participating in risky stunts is alarming. These activities pose a significant hazard to both the safety of the participants and other individuals using the road. Furthermore, the fact that many participants lack a valid driving license is a cause for concern, indicating that they may not have received proper training or meet the qualifications necessary for the safe operation of a motorcycle. The elevated percentage of participants with a track record of disregarding traffic regulations and facing legal consequences suggests a lack of seriousness toward

the law. This is a major issue as it implies a higher likelihood of engaging in other perilous behaviours, such as substance abuse and criminal activities.

These research findings highlight that individuals who adhere to traditional masculine norms are more likely to engage in illegal racing and display aggressive behaviour. This finding is supported by several studies that suggest that the need to be powerful, dominant, respected, and engage in reckless driving are ways of expressing masculinity [48-50]. Research has shown a correlation between masculinity and driving styles, where men are more likely to engage in aggressive driving and speeding [51-53]. Illegal racers display violence, intimidation, and domineering attitudes, which are signs of high masculine identity. This is supported by previous research, which has shown that men who conform to masculine norms are more likely to justify using any form of aggression to overcome disputes [41, 44].

The findings of this study indicate that young illegal racers often demonstrate their masculinity and aggressive behaviour within the context of a large group or street gang. This behaviour is influenced by the mob mentality, which can cause individuals to behave in a similar manner, lose their sense of self-awareness, and make decisions based on the desire to conform to the group [54, 55].

The prevalence of the mob mentality within the illegal racing community in Malaysia highlights a larger issue of a group of individuals who disregard the law and repeatedly engage in this criminal activity. It is important to note that mob mentality is not unique to illegal racing and can be observed in various contexts, including protests, riots, and sports events. In these situations, individuals are often influenced by the emotions and behaviours of those around them and may act in ways they would not engage in otherwise. The prevalence of the mob mentality within the illegal racing community in Malaysia suggests that there may be deeper social and cultural factors contributing to this phenomenon. Hence, addressing these underlying factors may be critical to effectively reducing the occurrence of illegal racing and its associated risks.

Another potential intervention strategy could involve community-based programs that provide individuals with alternative ways to express their masculinity that do not involve dangerous driving behaviour. This could include initiatives that promote healthy lifestyle choices, physical fitness, and other activities that allow individuals to showcase their physical prowess and strength in a safe and healthy manner. Finally, it may also be useful to implement more stringent enforcement measures to deter individuals from engaging in reckless driving behaviour. This could involve increased fines and penalties for traffic violations, as well as increased police presence and surveillance to discourage individuals from engaging in dangerous driving practices.

The study's primary demographic of interest consisted of individuals between the ages of 13 and 30 who were actively participating in illegal motorcycle racing. This age

bracket was specifically selected since it encompasses the developmental stage during which individuals commonly initiate motorcycle riding, a critical factor for their engagement in illegal racing. This age range was also chosen based on the existing body of research, which indicates that the majority of illegal racers fall within this spectrum. It is worth highlighting that the study intentionally included cases involving individuals below the age of 18, even though they are not legally capable of providing formal consent. This inclusion was driven by the recognition that this younger demographic figure forms a substantial and influential segment of the illegal racing community. Their involvement in the study was deemed essential in order to comprehensively understand the dynamics of illegal motorcycle racing, as excluding them would have resulted in a significant data gap and an incomplete picture of this complex issue. This approach acknowledges the unique challenges and ethical considerations associated with involving minors in research while emphasizing the importance of their contribution to the study's findings.

However, the study has some limitations and caveats that need to be acknowledged. Firstly, the study only focused on young Malay males engaged in illegal racing in Penang, and the findings cannot be generalized to the entire population of Malaysia. Future studies could explore whether the adherence to masculine norms is different among illegal racers from different regions, ethnicities, or genders. Despite these limitations, this study provides valuable insights into the relationship between self-perceived masculine identity and racing engagement among illegal racers. The use of snowball sampling techniques allowed the researchers to recruit more participants, which increased the sample size and strengthened the reliability and validity of the findings. In recruiting the participants, snowball sampling was deemed suitable due to the challenges associated with accessing this population, the potential for identifying subgroups within the illegal motorcycle racer community, and the trust that may exist between members of this community [56]. Additionally, the sampling method was chosen since illegal racing is an activity that is not socially accepted and may be associated with legal consequences, potentially causing participants to be hesitant to come forward and participate in research.

CONCLUSION

This study highlights the significance of masculine identity and group dynamics in illegal racing behaviour, emphasizing the need to address the underlying social and cultural factors that contribute to this behaviour. Prevention programs should target factors, such as the desire for social approval and dominance. Effective interventions could challenge traditional notions of masculinity, promoting alternative forms that prioritize nonviolent conflict resolution and positive relationships. The findings of this study indicate that social approval and respect from peers are significant motivators for engaging in illegal racing. Hence, encouraging healthy relationships

and positive social connections may provide alternative sources of social validation and support, thereby reducing engagement in risky behaviours.

AUTHORS' CONTRIBUTION

It is hereby acknowledged that all authors have accepted responsibility for the manuscript's content and consented to its submission. They have meticulously reviewed all results and unanimously approved the final version of the manuscript.

LIST OF ABBREVIATIONS

CMNI = Conformity to Masculine Norms Inventory

SPSS = Statistical Package for the Social Sciences

OR = Odds Ratio

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Confidentiality was well kept during this study using an anonymous technique, in which only the researcher was able to assess the names of patients. To protect participant confidentiality and privacy, each participant was assigned a unique identification code in place of their name or other identifying information.

Ethical clearance approval was obtained from the Research and Innovation Management Centre (RIMC), Universiti Utara Malaysia on 12th February 2021.

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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REFERENCES

- [1] Luke R. Current and future trends in driver behaviour and traffic safety scholarship: An african research agenda. *Int J Environ Res Public Health* 2023; 20(5): 4290. <http://dx.doi.org/10.3390/ijerph20054290> PMID: 36901299
- [2] Bachoo S, Bhagwanjee A, Govender K. The influence of anger, impulsivity, sensation seeking and driver attitudes on risky driving behaviour among post-graduate university students in Durban, South Africa. *Accid Anal Prev* 2013; 55: 67-76. <http://dx.doi.org/10.1016/j.aap.2013.02.021> PMID: 23523893
- [3] Mann RE, Asbridge M, Stoduto G, *et al.* Psychological distress and collision involvement among adult drivers. *Stress Health* 2010; 26(2): 127-34. <http://dx.doi.org/10.1002/smi.1274>
- [4] Vingilis E, Smart RG. Street racing: A neglected research area? *Traffic Inj Prev* 2009; 10(2): 148-56. <http://dx.doi.org/10.1080/15389580802641753> PMID: 19333827
- [5] Wickens CM, Smart RG, Vingilis E, Ialomiteanu AR, Stoduto G, Mann RE. Street racing among the Ontario adult population: Prevalence and association with collision risk. *Accid Anal Prev* 2017; 103: 85-91. <http://dx.doi.org/10.1016/j.aap.2017.03.021> PMID: 28391091
- [6] Vingilis E, Smart RG, Mann RE, Paglia-Boak A, Stoduto G, Adlaf EM. Prevalence and correlates of street racing among Ontario high school students. *Traffic Inj Prev* 2011; 12(5): 443-50. <http://dx.doi.org/10.1080/15389588.2011.602148> PMID: 21972854
- [7] Wong LP. Factors associated with illegal motorcycle street racing and help-seeking intention. *Behav Med* 2012; 38(2): 54-63. <http://dx.doi.org/10.1080/08964289.2012.661804> PMID: 22676631
- [8] Wong LP. Socio-demographic and behavioural characteristics of illegal motorcycle street racers in Malaysia. *BMC Public Health* 2011; 11(1): 446. <http://dx.doi.org/10.1186/1471-2458-11-446> PMID: 21649937
- [9] Wells LE, Rankin JH. Families and delinquency: A meta-analysis of the impact of broken homes. *Soc Probl* 1991; 38(1): 71-93. <http://dx.doi.org/10.2307/800639>
- [10] Amato PR, Keith B. Parental divorce and the well-being of children: A meta-analysis. *Psychol Bull* 1991; 110(1): 26-46. <http://dx.doi.org/10.1037/0033-2909.110.1.26> PMID: 1832495
- [11] Sankar MG, Abraham A. Teenagers and driving. Reference Module in Biomedical Sciences. (1st ed.), *Encyclopedia of Child and Adolescent Health* 2023. <http://dx.doi.org/10.1016/B978-0-12-818872-9.00181-3>
- [12] Kohler R, Lichenstein SD, Cheng A, *et al.* Identification of a composite latent dimension of reward and impulsivity across clinical, behavioral, and neurobiological domains among youth. *Biol Psychiatry Cogn Neurosci Neuroimaging* 2024; 9(4): 407-16. PMID: 38052266
- [13] Steinberg L. Cognitive and affective development in adolescence. *Trends Cogn Sci* 2005; 9(2): 69-74. <http://dx.doi.org/10.1016/j.tics.2004.12.005> PMID: 15668099
- [14] Romich JL, Roll S, East J, Posey-Maddox L, Haley-Lock A, Newkirk K. Handbook of child maltreatment. *Child Youth Serv Rev* 2017; 16 (3).
- [15] Kuzhiyengal Mambra AJ, Kotian S. Exploring the influence of socioeconomic factors on aggressive behavior among higher secondary students: A literature review. *SSRN EJ* 2023. <http://dx.doi.org/10.2139/ssrn.4591973>
- [16] Kimmel MS. *Manhood in America: A cultural history.* Oxford University Press 2016.
- [17] Watson BTDWKSC. *Psychological and Social Factors Influencing Motorcycle Rider Intentions and Behaviour Australian Capital Territory, Canberra, Australia: Australian Transport Safety Bureau* 2007.
- [18] Ahn KO, Kim J, Shin SD, Park H, Vaca FE, Park JO. The influence of behavioural and socioeconomic factors on the community injury rates of adolescents assessed by the south Korean emergency

- medical services: An ecological approach. *BMC Public Health* 2019; 19(1): 830.
<http://dx.doi.org/10.1186/s12889-019-7190-6> PMID: 31242881
- [19] Svendby R, Lilleaas UB. Change and continuation: Masculinity, driving, and disability in the lives of “young problem drivers” in the aftermath of severe road traffic accidents. *NORA* 2019; 27(3): 194-205.
<http://dx.doi.org/10.1080/08038740.2019.1602563>
- [20] Deniz P, Lajunen T, Özkan T, Gaygısız E. Masculinity, femininity, and angry drivers: Masculinity and femininity as moderators between driver anger and anger expression style among young drivers. *Accid Anal Prev* 2021; 161: 106347.
<http://dx.doi.org/10.1016/j.aap.2021.106347> PMID: 34403907
- [21] Almarhabi Y, Mufti AI, Almaymuni AD, *et al.* Substance abuse at early age as a potential risk factor for driving under the influence of substance in Jeddah, Saudi Arabia: A cross-sectional study. *Traffic Inj Prev* 2018; 19(7): 687-92.
<http://dx.doi.org/10.1080/15389588.2018.1494828> PMID: 30040504
- [22] Faghisolouk F, Sohrabizadeh S, Soori H, Khorasani-Zavareh D. Exploring the factors affecting unsafe antisocial behaviors of drivers in Iran: A qualitative study. *Bull Emerg Trauma* 2021; 9(1): 28-35.
 PMID: 33937423
- [23] Simonsen KW, Hasselstrøm JB, Hermansen SK, *et al.* The incidence of psychoactive substances and alcohol among impaired drivers in Denmark in 2015-2019. *Forensic Sci Int* 2022; 333: 111207.
<http://dx.doi.org/10.1016/j.forsciint.2022.111207> PMID: 35144220
- [24] Ferrari D, Manca M, Banfi G, Locatelli M. Alcohol and illicit drugs in drivers involved in road traffic crashes in the Milan area. A comparison with normal traffic reveals the possible inadequacy of current cut-off limits. *Forensic Sci Int* 2018; 282: 127-32.
<http://dx.doi.org/10.1016/j.forsciint.2017.11.005> PMID: 29197242
- [25] Shults RA, Jones JM, Komatsu KK, Sauber-Schatz EK. Alcohol and marijuana use among young injured drivers in Arizona, 2008-2014. *Traffic Inj Prev* 2019; 20(1): 9-14.
<http://dx.doi.org/10.1080/15389588.2018.1527032> PMID: 30681899
- [26] Abdullah MS, Mohamed Kassim MA, Mansor MF. Risky riding behaviour among Malaysian young motorcyclists. *MATEC WoC* 2018; 150: 05022.
<http://dx.doi.org/10.1051/mateconf/201815005022>
- [27] Cordellieri P, Sdoia S, Ferlazzo F, Sgalla R, Giannini AM. Driving attitudes, behaviours, risk perception and risk concern among young student car-drivers, motorcyclists and pedestrians in various EU countries. *Transp Res, Part F Traffic Psychol Behav* 2019; 65: 56-67.
<http://dx.doi.org/10.1016/j.trf.2019.07.012>
- [28] McKenzie SK, Collings S, Jenkin G, River J. Masculinity, social connectedness, and mental health: Men’s diverse patterns of practice. *Am J Men Health* 2018; 12(5): 1247-61.
<http://dx.doi.org/10.1177/1557988318772732> PMID: 29708008
- [29] Berke DS, Reidy D, Zeichner A. Masculinity, emotion regulation, and psychopathology: A critical review and integrated model. *Clin Psychol Rev* 2018; 66: 106-16.
<http://dx.doi.org/10.1016/j.cpr.2018.01.004> PMID: 29398184
- [30] Courtenay WH. Constructions of masculinity and their influence on men’s well-being: A theory of gender and health. *Soc Sci Med* 2000; 50(10): 1385-401.
[http://dx.doi.org/10.1016/S0277-9536\(99\)00390-1](http://dx.doi.org/10.1016/S0277-9536(99)00390-1) PMID: 10741575
- [31] David DS, Pleck JH. The myth of masculinity. *Contemp Sociol* 1983; 12(1): 102.
<http://dx.doi.org/10.2307/2068233>
- [32] Mahalik JR, Locke BD, Ludlow LH, *et al.* Development of the conformity to masculine norms inventory. *Psychol Men Masc* 2003; 4(1): 3-25.
<http://dx.doi.org/10.1037/1524-9220.4.1.3>
- [33] Rice SM, Aucote HM, Maria Möller-Leimkühler A, Parker AG, Kaplan RA, Seidler ZE. Conformity to masculine norms and the mediating role of internalised shame on men’s depression: Findings from an Australian community sample. *Int J Mens Health* 2016; 15(2): 157-64.
- [34] Braly AM, Parent MC, DeLucia PR. Do threats to masculinity result in more aggressive driving behavior? *Psychol Men Masc* 2018; 19(4): 540-6.
<http://dx.doi.org/10.1037/men0000135>
- [35] Levant R. The male role: An investigation of contemporary norms. *J Ment Health Couns* 1992; 14(3): 325-7.
- [36] Kulis S, Marsiglia FF, Hurdle D. Gender identity, ethnicity, acculturation, and drug use: Exploring differences among adolescents in the Southwest. *J Community Psychol* 2003; 31(2): 167.
- [37] Rowden P, Watson B, Haworth N, Lennon A, Shaw L, Blackman R. Motorcycle riders’ self-reported aggression when riding compared with car driving. *Transp Res, Part F Traffic Psychol Behav* 2016; 36: 92-103.
<http://dx.doi.org/10.1016/j.trf.2015.11.006>
- [38] Lai MK, Aritejo BA. Personal and social factors affecting adolescent motorcycle riders’ intention to customize their vehicles: Evidence from Indonesia. *Transp Res, Part F Traffic Psychol Behav* 2013; 20: 6-16.
<http://dx.doi.org/10.1016/j.trf.2013.04.001>
- [39] Austin DM, Gagné P. Community in a mobile subculture: The world of the touring motorcyclist. *Stud Symbolic Interact* 2008; 30: 411-37.
[http://dx.doi.org/10.1016/S0163-2396\(08\)30021-0](http://dx.doi.org/10.1016/S0163-2396(08)30021-0)
- [40] Trisha N. 200 nabbed over illegal racing, dangerous bike stunts in Penang, Malaysia: *The Star* 2023.
- [41] Gerdes ZT, Levant RF. Complex relationships among masculine norms and health/well-being outcomes: Correlation patterns of the conformity to masculine norms inventory subscales. *Am J Men Health* 2018; 12(2): 229-40.
<http://dx.doi.org/10.1177/1557988317745910> PMID: 29219033
- [42] Siraj R, Najam B, Ghazal S. Sensation seeking, peer influence, and risk-taking behavior in adolescents. *Educ Res Int* 2021; 2021
- [43] Exner-Cortens D, Wright A, Claussen C, Truscott E. A systematic review of adolescent masculinities and associations with internalizing behavior problems and social support. *Am J Community Psychol* 2021; 68(1-2): 215-31.
<http://dx.doi.org/10.1002/ajcp.12492> PMID: 33417737
- [44] Herreen D, Rice S, Currier D, Schlichthorst M, Zajac I. Associations between conformity to masculine norms and depression: Age effects from a population study of Australian men. *BMC Psychol* 2021; 9(1): 32.
<http://dx.doi.org/10.1186/s40359-021-00533-6> PMID: 33608063
- [45] Youth LA, Racing S. Youth and street racing. *Curr Issues Crim Justice* 1996; 7(3): 388-93.
<http://dx.doi.org/10.1080/10345329.1996.12036716>
- [46] Rusli R, Oviedo-Trespalacios O, Abd Salam SA. Risky riding behaviours among motorcyclists in Malaysia: A roadside survey. *Transp Res, Part F Traffic Psychol Behav* 2020; 74: 446-57.
<http://dx.doi.org/10.1016/j.trf.2020.08.031>
- [47] Ali SZNB. Uncovering the risky riding behaviors among young motorcyclist in urban areas. *Proceedings of AWAM International Conference on Civil Engineering 2022*, . Springer, Singapore, 04 January 2024, pp 335-352.
- [48] Ericson M. ‘It is men who die and all that, so what is new?’ Male vulnerability, institutionalised masculinity and the present absence of a problem in Swedish rescue service accident prevention. *Norma (Oslo)* 2021; 16(3): 159-73.
<http://dx.doi.org/10.1080/18902138.2021.1908761>
- [49] Taubman Ben-Ari O. The combined contribution of personality, family traits, and reckless driving intentions to young men’s risky driving: What role does anger play? *Transp Res, Part F Traffic Psychol Behav* 2016; 42(2): 299-306.
- [50] Merdassa AB. Traditional masculinity, peer pressure, and sensation seeking as correlates of risky behaviours. *Int J Adolesc Youth* 2024; 29(1): 2298087.

- <http://dx.doi.org/10.1080/02673843.2023.2298087>
- [51] Zang Y, Wen L, Cai P, *et al.* How drivers perform under different scenarios: Ability-related driving style extraction for large-scale dataset. *Accid Anal Prev* 2024; 196: 107445.
<http://dx.doi.org/10.1016/j.aap.2023.107445> PMID: 38159512
- [52] Noreen M, Noor S. Psycho-social Correlates of Driving Behavior: A Masculinity Perspective. *Pak J Humanit Soc* 2023; 11(2)
<http://dx.doi.org/10.52131/pjhss.2023.1102.0479>
- [53] Hussin Z, Ahmad SR. Masculine Identity: How It Affects Street Racing and Aggressive Behaviour in Young Motorcyclists. *MJSSH* 2022; 7(12): e001976.
<http://dx.doi.org/10.47405/mjssh.v7i12.1976>
- [54] Lama S. Mob psychology and crowd control. *Criminal Psychology and the Criminal Justice System in India and Beyond*. Singapore: Springer 2021; pp. 155-71.
http://dx.doi.org/10.1007/978-981-16-4570-9_10
- [55] Replogle E. Reference groups, mob mentality, and bystander intervention: A sociological analysis of the Lara Logan case. *Sociol Forum* 2011; 26(4): 796-805.
<http://dx.doi.org/10.1111/j.1573-7861.2011.01284.x>
- [56] Negrin KA, Slaughter SE, Dahlke S, Olson J. Successful recruitment to qualitative research: A critical reflection. *Int J Qual Methods* 2022; 21
<http://dx.doi.org/10.1177/16094069221119576>