

## Toricelli-Based Defensive Riding Training for Peer Educators of SMKN 1 Banjarbaru Students

Vina Yulia Anhar<sup>1</sup>, Istiana<sup>2</sup>, Ihya Hazairin Noor<sup>\*3</sup>, Zuhrafa Wanna Yolanda<sup>4,5</sup>, Hafiz Akmal Hidayatullah Al-Ayyudi<sup>5</sup>, M. Naufal Hibatullah<sup>5</sup>

<sup>1</sup>Department of Health Behavior and Behavioral Sciences, Public Health Study Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, South Kalimantan, Indonesia

<sup>2</sup>Medical Education Study Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, South Kalimantan, Indonesia

<sup>3</sup>Department of Industrial Hygiene and Risk Management, Public Health Study Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, South Kalimantan, Indonesia

<sup>4</sup>Public Health Study Program Master's Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, South Kalimantan, Indonesia

<sup>5</sup>Public Health Study Program, Faculty of Medicine and Health Sciences, Lambung Mangkurat University, South Kalimantan, Indonesia

Correspondence Email: [ihyazairin@ulm.ac.id](mailto:ihyazairin@ulm.ac.id)

### ABSTRACT

Defensive riding training is a strategy that helps motorcyclists to always be in control and not be surprised by the actions of others. SMK Negeri 1 Banjarbaru, a school with many students using motorbikes for transportation, is located in an area with high-traffic accidents. This activity aims to provide students with an understanding of how to drive defensively and Toricelli-based. The method of implementing the service is to form peer educators, as many as six people from students aged 17 or this year aged 17, given education and training on Toricelli-based defensive riding training. The organizer evaluates knowledge through a pre-post test. The evaluation results showed increased knowledge about defensive riding training in students of SMKN 1 Banjarbaru. The role of peer educators of SMKN 1 Banjarbaru students can continue to remind their peers of the importance of safe driving culture, so that the role of peer educators does not only stop when this activity ends.

**Keywords:** Defensive riding training, peer educator, toricelli

### INTRODUCTION

Accident traffic is an incident where a vehicle crashes with other objects and causes damage, and is difficult to estimate where and when it happened.<sup>1</sup> According to World Health Organization (WHO), accidents are past events that involve one of the vehicles that cause injury or damage or losses to the owner.<sup>2</sup> The Global Status Report on Road Safety reported by WHO (World Health Organization) in 2018 states that the number of deaths as a result of accidents that cross roads every year reaches around 1.35 million souls. As many as 1.25 million people were victims of accidents, and around 20-50 million people were injured as a result of accident, dominated by motorbikes. Besides that, motorbikes are also the reason for accident. They cross number one every year.<sup>3</sup> WHO (World Health Organization) stated that accident then cross possibility big responsible answer on death children in the world. On average, each day, there were 1000 deaths at a distance ages 10–24 years. Besides that's,

54% of contributors die because of accident then traffic in the world originates from developing countries, one of them is Indonesia.<sup>4</sup>

Based on data from the Central Statistics Agency the Republic of Indonesia, which was gathered from Police Republic of Indonesia in 2019 number accident Then cross reached 116,441 cases, 25,671 experienced died, 12,475 experienced wound severe, and 137,324 experienced wound light. Amount This is up 7% compared to 2018 there were 109,215 cases. According to information from the Directorate Then cross show the group aged 15-24 years is the most experience accident Then traffic in Indonesia. Age is the time when somebody go through education, that is Senior high school (SMA) and lectures.<sup>5</sup>

Various factors influence the rise of teenage motorbike riders, namely internal factors and external factors. Internal factors are personal needs, more economical, more efficient, as well as factors from parents or

families who let their children use motorbikes. External factors that cause the rise of underage motorbike riders are the influence of peers, living environment and lifestyle. Teenage drivers think that they are old enough to ride a motorbike on the road, on the other hand, shallow driving knowledge often leads to fatal accidents. Their knowledge about vehicles still needs to be improved because it is still new to them. This lack of knowledge and experience makes teenage drivers less responsive to dangerous situations, resulting in potential accidents on the road.<sup>6</sup>

Reducing the number of road accidents that can cause disability or death must be a priority as an effort to prevent disability and death due to traffic accidents. Prevention of traffic accidents is of course influenced by their perception of the threat of traffic accidents they will receive.<sup>6</sup> Apart from that, peer support is also related to safety driving behavior because according to Azizah in 2016, peers are a factor that can influence a person's safety riding behavior. If most of their peers are aware of the safety risks of driving, usually other members in the same group will be influenced to become aware of the risks of driving safety.<sup>7</sup> In order to reduce the number of accidents in teenagers in the future, it is necessary to identify safety behavior factors when driving, one of which is defensive riding training for peer educators.

Defensive riding training is a strategy that helps motorcyclists stay in control and not be surprised by the actions of others. Defensive riding focuses on alertness (conscious condition when driving); Observation and awareness (understanding conditions and being alert to the surrounding environment); anticipation and planning (anticipating what will happen and being able to plan the next action) control (being able to control and controlling the situation) and Visibility (visible or easy to see) or what is abbreviated as TORICELLI. The main goal is to educate drivers on the basic driving patterns of two-wheeled vehicles (motorcycles), procedures for basic vehicle functions, safety features, vehicle control procedures, vehicle introduction concepts including the driver's understanding of the concept of maintenance for each vehicle before deciding to take it to workshop.<sup>8</sup> However, this is still an obstacle because defensive riding training still needs to be more familiar in Indonesia, especially in South Kalimantan.

In South Kalimantan alone, from 2018 to 2022 there were 3,513 traffic accidents, with 1,789 deaths, 532 serious injuries and 3,197 minor injuries. The districts and cities with the most traffic accidents in South Kalimantan in the last five years are Banjar Regency with 456

cases, Banjarbaru City with 413 cases and Kotabaru Regency with 376 cases. Banjarbaru City is the second highest area that has experienced traffic accidents in the last 5 years in South Kalimantan and in terms of material losses Banjarbaru also occupies the first position amounting to Rp. 1,276,050,000,- and more than Banjar Regency which occupies the number 1 position in accident cases with material losses amounting to Rp. 1,184,560,000,-.<sup>9</sup>

The Banjarbaru Police Traffic Directorate report shows that in South Banjarbaru District in 2022, the place that most often experiences traffic accidents is Jalan Achmad Yani (A.Yani), namely 7 cases (35%) out of 20 cases, followed by Jalan Trikora with 5 cases (25%), then Jalan Mistar Cokrokusumo with 3 cases (15%), then Jalan Dahlina Raya with 2 cases (10%), then Jalan Puyau, Jalan Chandra, Jalan RO. Ulin each with 1 case (5%). The school located on Jalan Achmad Yani (A.Yani) South Banjarbaru District, which is an accident-prone location with the highest number of traffic accidents, is SMK Negeri 1 Banjarbaru. The main entrance to SMK Negeri 1 Banjarbaru is directly connected to Jalan Achmad Yani.<sup>10</sup>

Based on data collection carried out by one of the schools, the number of students in grades 10 and 11 at SMK Negeri 1 Banjarbaru is 559 people, more than 50% of whom use motorbikes as the main means of getting to school and the school also does not prohibit students under age to take a motorbike to school. This is not in accordance with the minimum age limit permitted to ride a motorbike, namely 17 years and you must have a driving license (SIM). The behavior of teenagers who tend to be aggressive in riding, riding motorbikes at high speed with the excuse of being late or going against the flow to shorten time. It can be concluded that this triggers the risk of unsafe behavior when driving because students are not yet of the legal age to ride a motorbike. This is also supported by the school's statement that students at SMK Negeri 1 Banjarbaru once experienced a traffic accident on their way to school and the Banjarbaru Police Traffic Directorate noted that during 2022 there were 43 cases of which were teenage traffic accidents and 23 cases were students at the SMA/SMK level. /MA became victims of traffic accidents, and 5 people or 22% of them occurred among students at SMK Negeri 1 Banjarbaru.<sup>11</sup>

Defensive riding focuses on alertness (a conscious state when riding); Observation and awareness (understanding conditions and being alert to the surrounding environment); anticipation and planning (anticipating what will

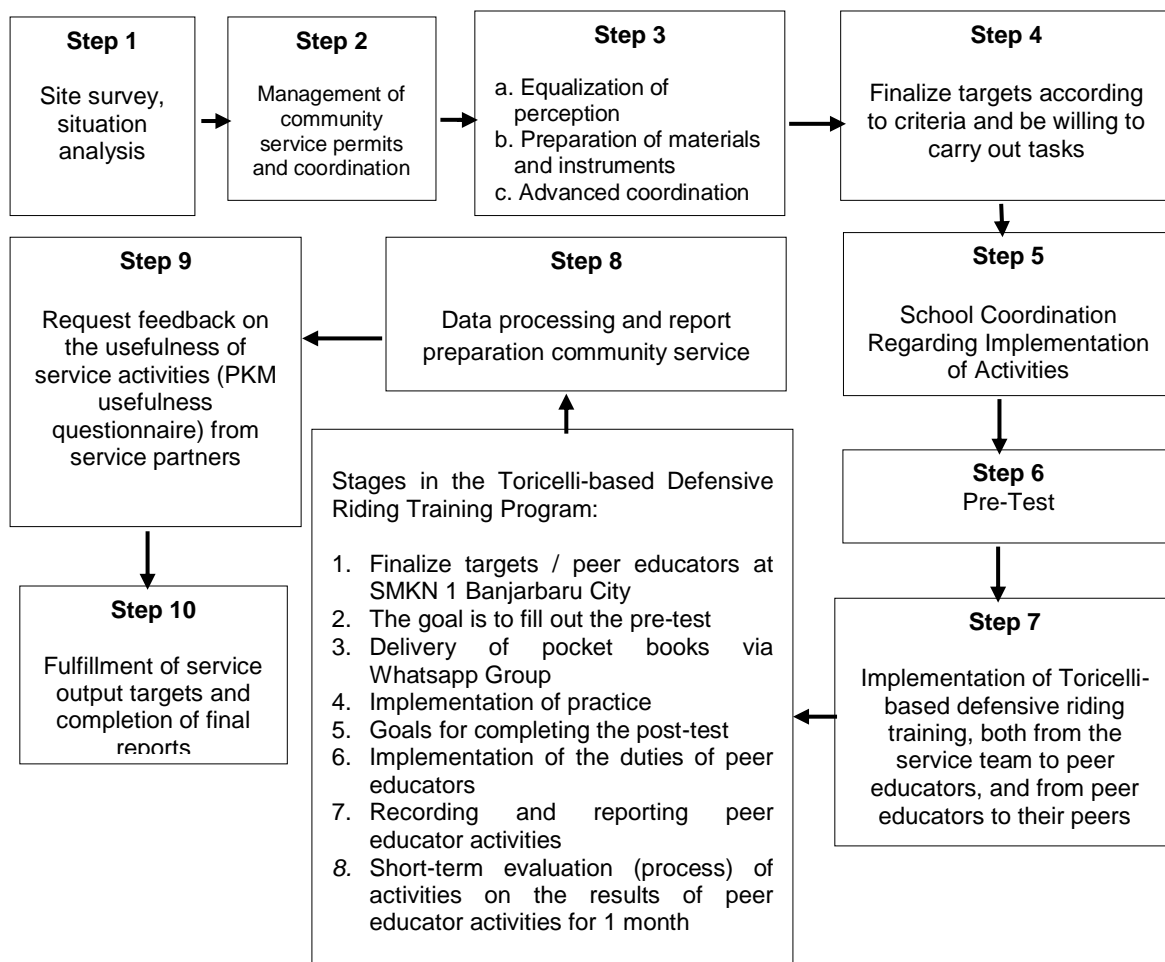
happen and being able to plan the next action) control (being able to control and controlling the situation) and Visibility (visible or easy to see) or what is abbreviated as TORICELLI.

One program that can be carried out in terms of the concept of driving safety is TORICELLI-based defensive riding training for peer educators. The peer educators selected to take part in this activity are students of SMKN 1 Banjarbaru City who are 17 years old or who will be 17 years old this year. This activity will also involve the Banjarbaru Police Traffic Directorate to conduct training for students. It is hoped that this activity can be a basis for reducing the occurrence of driving accidents, especially among school children. Moreover, this program aims to educate teenagers specifically to develop defensive riding behavior, which can ultimately reduce the number of accidents.

**METHOD**

One program that can be effectively implemented to address driving safety concerns is TORICELLI-based defensive riding training for peer educators. This method offers several advantages:

1. Increased Engagement: Students are more likely to be receptive to safety messages delivered by their peers, creating a more relatable learning environment.
2. Improved Knowledge Retention: Peer educators will gain in-depth knowledge through comprehensive training, allowing them to effectively communicate defensive riding techniques to their classmates.
3. Peer-to-Peer Dissemination: Trained peer educators can act as multipliers, spreading defensive riding awareness throughout the student population in a natural and ongoing manner.



**Figure 1.** Activity Scheme

The service team will follow these steps to execute the program:

1. Peer Educator Selection: We will recruit six students aged 17 or turning 17 this year. Selection criteria will include a willingness to participate, ownership of a suitable

electronic device for program materials, active school involvement, strong interpersonal and communication skills, and a friendly, outgoing personality. Additionally, they should be articulate, adaptable, self-motivated, open to learning, and helpful

towards others.

2. Collaborative Recruitment: The service team will collaborate with school officials to identify and recruit suitable peer educators.
3. Comprehensive Training: The organizers and the Banjarbaru City Police will provide peer educators with in-depth training on defensive riding techniques and driver's license test practices. This will equip them with the necessary expertise to educate their peers effectively.
4. Peer-Led Training Sessions: Trained peer educators will conduct defensive riding training sessions for their classmates under the supervision of the organizers and police representatives. This peer-to-peer approach fosters a more engaging learning experience.
5. Knowledge Assessment: The organizers will evaluate the program's effectiveness by administering pre- and post-training knowledge tests to participants. This will measure the impact of the training on students' understanding of defensive riding principles.
6. Feedback and Improvement: Finally, we will solicit feedback from school officials on the program's usefulness and identify areas for improvement in future iterations.

The implementation scheme is as follows:  
TORICELLI - Based Defensive Riding Training Program Steps:

**Step 1: Site Survey and Situation Analysis**

1. Conduct a comprehensive survey of the target area to identify potential hazards and challenges related to defensive riding.
2. Analyze the traffic patterns, road conditions, and common accidents in the area to understand the specific risks faced by riders.
3. Collect data on rider demographics, behavior, and attitudes to gain insights into their needs and preferences.

**Step 2: Management of Community Service Permits and Coordination**

1. Obtain the necessary permits and approvals from local authorities to conduct the community service program.
2. Coordinate with the school administration and relevant stakeholders to ensure smooth implementation of the program.
3. Establish a clear communication plan to keep all parties informed about the program's progress and outcomes.

**Step 3: Equalization of Perception**

1. Conduct a pre-training assessment to gauge the participants' knowledge and understanding of defensive riding principles.
2. Identify any gaps in knowledge or

misconceptions and address them through targeted training modules.

3. Ensure that all participants have a common understanding of the importance of defensive riding and the key techniques involved.

**Step 4: Finalize Targets According to Criteria and Be Willing to Carry Out Tasks**

1. Define clear and measurable objectives for the program based on the identified needs and available resources.
2. Set realistic targets for the number of participants to be trained and the level of knowledge and skill improvement to be achieved.
3. Ensure that the program is aligned with the overall goals of the community service initiative.

**Step 5: Preparation of Materials and Instruments**

1. Develop comprehensive training materials that cover all aspects of defensive riding, including theoretical concepts, practical exercises, and case studies.
2. Prepare visual aids, handouts, and other resources to enhance the learning experience and promote engagement.
3. Ensure that the materials are tailored to the specific needs and learning styles of the target audience.

**Step 6: Advanced Coordination**

1. Conduct a series of coordination meetings with key stakeholders, including school officials, instructors, and volunteers.
2. Finalize the program schedule, logistics, and contingency plans to ensure smooth implementation.
3. Establish clear roles and responsibilities for all parties involved in the program.

**Step 7: Implementation of Toricelli-Based Defensive Riding Training**

1. Deliver the training program using a variety of methods, such as lectures, demonstrations, group discussions, and hands-on exercises.
2. Incorporate the TORICELLI principles into the training to emphasize the importance of anticipation, planning, and risk management.
3. Provide opportunities for participants to practice defensive riding techniques in a safe and controlled environment.

**Step 8: Data Processing and Report Preparation**

1. Collect data on the participants' performance and progress throughout the training program.
2. Analyze the data to assess the effectiveness of the program and identify areas for improvement.

3. Prepare a comprehensive report that summarizes the program's findings, conclusions, and recommendations.

**Step 9:** Request Feedback on the Usefulness of Service Activities (PKM Usefulness Questionnaire) from Service Partners

1. Distribute feedback forms to participants and other stakeholders to gather their opinions on the program's usefulness.
2. Collect feedback on the content, delivery, and overall impact of the program.
3. Use the feedback to improve the program and ensure that it meets the needs of the target audience.

**Step 10:** Fulfillment of Service Output Targets and Completion of Final Reports

1. Ensure that all program objectives have been met and the desired outcomes have been achieved.
2. Complete all required reports and documentation in a timely and accurate manner.

Disseminate the program's findings and recommendations to relevant stakeholders.

## RESULT AND DISCUSSION

Youth service activities involve peers who are 17 years old or who will be 17 years old this year. This activity is divided into 2 stages, namely defensive riding training and driver's license test practice for peer educators, as well as defensive riding training from peer educators to their peers. The first activity began with forming 6 peer educators from SMKN 1 Banjarbaru. After forming peer educators, they were then given education and training about defensive riding as well as driving license test practice which was carried out on Monday, August 21 2023 starting at 08.30 – 11.30 WITA at the Banjarbaru City Police Station. This activity began with an opening and speech from the Banjarbaru Police Representative, then continued with completing a pretest to see the peer educators' driving abilities.



**Figure 2.** Providing Education to Peer Educators by The Banjarbaru City Police



**Figure 3.** Providing Education to Peer Educators by The Team



**Figure 4.** Simulation Practice of SIM Making Tests by Peer Educators

The second activity was carried out in the field of SMKN 1 Banjarbaru which was attended by 77 students of SMKN 1 Banjarbaru. The activity will be held on Thursday, August 24 2023 starting at 08.00 – 12.00 WITA. This activity began with an opening and remarks from the school principal and representatives of the Banjarbaru Police, then continued with completing a pretest to see the knowledge and abilities of SMKN 1 Banjarbaru students related to defensive riding.



**Figure 5.** Providing Defensive Riding Education by Peer Educators to Peers

**Table 1. Frequency Distribution of Respondent Characteristics**

Characteristics	frequency	Percentage
Age		
14	1	1,29
15	21	27,3
16	38	49,4
17	13	16,9
18	4	5,19
Gender		
Female	52	67,5
Male	25	32,4

Source: Primary Data, 2023

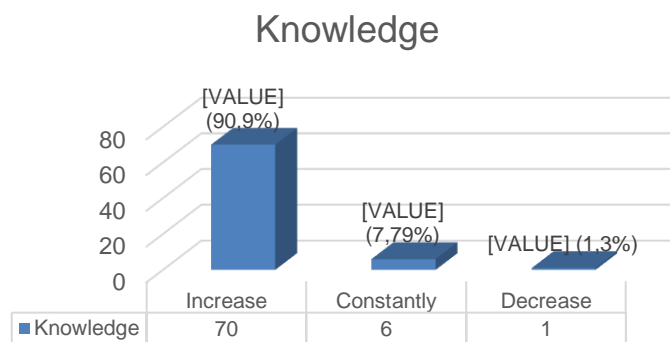
Based on table 1, it can be seen that of the 77 respondents, 14 year old teenagers were 1 person (1.29%), 15 year old teenagers were 21 people (27.3%), 16 year old teenagers were 38 people (49.4%), 13 year old teenagers (16.9%), and 4 18 year old teenagers (5.19%). Age can influence a person's safe driving behavior, students who are  $\geq 17$  years old are expected to show better behavior because they tend to be more experienced in dealing with situations and have a driving license compared to students who are  $< 17$  years old. Riders over 30 years old are more mature and have more experience in motorbike riding behavior than riders under 30 years old.<sup>12</sup>

Young riders think that they are mature enough to ride a motorbike on the road, on the other hand, poor driving knowledge often causes fatal accidents. Young drivers'

knowledge about vehicles is still lacking because it is still something new for them. This lack of knowledge and experience makes young drivers less responsive to threatening situations, resulting in the potential for traffic accidents.<sup>13</sup> This is because age is one of the factors related to a person's behavior. Someone who is mature in age will behave safely when driving.

Regarding gender, the 77 respondents were 52 women (67.5%) and 25 men (32.4%). According to some opinions, women tend to pay more attention to traffic rules and be careful when driving. Women perceive risk better than men, so women do not make as many aggressive maneuvers when driving. Gender differences can influence how a person makes decisions while driving, where it is known that young male drivers tend to have high self-confidence in their driving abilities and result in more dangerous driving behavior than female drivers.<sup>14</sup>

In studies, young drivers, especially men, tend to have more negative evaluations of traffic rules than women. The existence of a positive evaluation of the rules will influence driving behavior. Where when a person is able to see and know the benefits of obeying the rules which can prevent him from having an accident or becoming a victim, this makes a person more disciplined in obeying the rules when driving.<sup>15</sup>



**Figure 6. Frequency Distribution Adolescent Knowledge**

Based on the table above, it can be seen that as many as 70 people (90.9%) had an increase in the participants' scores in the post-test when compared to the pre-test scores, as many as 6 people (7.79%) had the same scores in both tests and a small number as many as 1 person (1.3%) experienced a decrease in the post-test score when compared with the pre-test score.

Based on the analysis, some students

experienced an increase in the post-test, to be precise 22 students experienced an increase, 3 students experienced neither a decrease nor an increase, and 1 student experienced a decrease. The inhibiting factor that causes the decline is that students answer incorrectly or are not careful in answering the questions in the sections 'What is meant by defensive riding' and 'Which is considered a safe driving culture', meaning that students still have difficulty

interpreting the meaning of defensive riding and distinguishing between a safe driving culture? how, so that wrong answers are still found during the post-test. However, these inhibiting factors were not used as significant obstacles in implementation because during the process the extension activities ran smoothly and the majority of students experienced an increase in knowledge.

Motorbikes are the most frequently used mode of transportation today. This is due to the high level of flexibility of its use in transportation in city environments which are always in traffic jams. Relatively affordable prices, low operational costs, ease of use, and the availability of various types and features of motorbikes tailored to consumer needs mean that the motorbike population continues to increase from time to time. As the number of motorized vehicles increases, even though motorbike manufacturers are trying hard to improve the safety features of their products, the number of accidents involving motorbikes continues to increase. Likewise, the number of accident victims has also increased, most of which come from vocational school students.<sup>16</sup>

Through this service activity, the students of SMKN 1 Banjarbaru began to realize and understand that riding is not just about being able to ride a motorbike, but also how to create safe driving conditions (defensive riding) by using a motorbike that is roadworthy (according to the standards set by the Indonesian Government). This awareness must be instilled from an early age in students at SMKN 1 Banjarbaru to prevent and at the same time reduce the number of accidents so that it is hoped that it will become a culture that sticks with students and become a habit of safe and comfortable driving behavior.<sup>16</sup>

As future leaders of the nation, vocational school students must be equipped with the ability to analyze how to act (drive) correctly and safely. So, from the moment they enter school, they are provided with character building education for students which will later become a culture in every action, both in studying and driving. Building a culture of awareness of correct and safe driving is provided on an ongoing basis to ensure that the future of high school students can be achieved, one of which is through building a culture of driving awareness from an early age.<sup>16</sup>

The results of the student post-test showed that a percentage of 90.9% of students experienced an increase in knowledge, 7.79% had a constant score from pre-test to post-test and 1.3% of students experienced a decrease. This shows that the level of students' knowledge has increased because students are

able to absorb the material delivered by peer educators and assistants well and this can be seen from students who already know about driving safety, defensive riding, driving license use, traffic signs, meaning. from clan lines, and driving culture.



**Figure 7.** Community Service Activities at SMKN 1 Banjarbaru

The counseling can run well and students also seem serious about paying attention to the counseling. Indirectly, students' knowledge about defensive riding has increased because counseling has been provided by peer educators who are their peers. Based on the results of the analysis, it was stated that there were differences in the level of knowledge before and after the counseling was given, which means that the counseling influenced students' knowledge in knowing safety behavior factors when driving, one of which was defensive riding.

Therefore, it can be concluded that Toricelli-based counseling and Defensive Riding Training for peer educators at SMKN 1 Banjarbaru students is considered quite effective in educating basic drivers regarding driving patterns of two-wheeled vehicles (motorcycles), procedures for basic vehicle functions, safety features, procedures. vehicle control, the concept of vehicle recognition including the driver's understanding of the concept of maintenance for each vehicle before deciding to take it to a repair shop.

## CONCLUSION

Through socialization activities and Toricelli-based Defensive Riding Training for students at SMKN 1 Banjarbaru, they can increase their understanding of safety behavior factors when driving to reduce the number of accidents among adolescents in the future.

## ACKNOWLEDGMENTS

The author would like to thank the Research and Service Institute of Lambung Mangkurat University for providing funds so that

this service can be carried out smoothly. Don't forget to thank the service partners of SMKN 1 Banjarbaru and also thank the Banjarbaru City Police for being willing to collaborate for the smooth running of this activity.

## REFERENCES

1. Yenimar, et al. Implementasi Aplikasi Amal Korban Kecelakaan Berbasis Android Menggunakan Metode Fundraising. *Journal of Informatics Pelita Nusantara* 2019; 4(1): 8-13.
2. Anisarida, AA., Santosa W. Korban Kecelakaan Lalu Lintas Sepeda Motor di Kota Bandung. *Jurnal HPJI (Himpunan Pengembangan Jalan Indonesia)* 2019; 5(2): 129-36.
3. World Health Organization. *Global Status Report on Road Safety*. 2018. World Health Organization. Geneva: 2018.
4. World Health Organization. *Global Status Report on Road Safety*. World Health Organization. Geneva: 2018.
5. World Health Organization. *Global Status Report on Road Safety*. World Health Organization. Geneva: 2018.
6. Lumba P, Ariyanto A, Alfirahmi A, Rismalinda R. Dampak Peningkatan Pengendara Sepeda Motor Dibawah Umur terhadap Jumlah Kecelakaan di Indonesia. *Aptek* 2022; 14(2): 94-102.
7. Azizah, MHA. Faktor yang Berhubungan dengan Perilaku Keselamatan Berkendara (Safety Riding) pada Mahasiswa (Studi pada Mahasiswa FMIPA UNNES). Semarang: Universitas Negeri Semarang, 2016.
8. Synergy Solusi. *Training Defensiver Riding*, 2020.
9. Direktorat Lalu Lintas Polisi Daerah Kalimantan Selatan. *Data Sekunder Kecelakaan Lalu Lintas Di Kalimantan Selatan tahun 2021 dan 2022 Berdasarkan Beberapa Kriteria*. Banjarmasin: 2023.
10. Direktorat Lalu Lintas Polisi Daerah Kalimantan Selatan. *Data Kecelakaan Lalu Lintas per Kabupaten/Kota Di Kalimantan Selatan tahun 2018-2022*. Banjarmasin: 2023.
11. Direktorat Lalu Lintas Polisi Resor Banjarbaru. *Data Sekunder Kecelakaan Lalu Lintas Di Banjarbaru*. Banjarbaru: 2023.
12. Puteri AD, Nisa AM. Faktor-Faktor yang Berhubungan dengan Perilaku Safety Driving pada Supir Travel di PT. Libra Wisata Transport. *Prepotif: Jurnal Kesehatan Masyarakat* 2020; 4(1):1-10.
13. Fahmi, K. Faktor penyebab kecelakaan lalu lintas dan perilaku berkendara pada Siswa Sekolah Menengah Atas di Pasir Pengaraian Riau. *Jurnal Ilmiah Cano Ekonomos* 2021; 10(1): 1-10.
14. Alfiansyah, TR, Sestiono M. Faktor yang berhubungan dengan perilaku keselamatan berkendara sepeda motor (safety riding) pada siswa SMA di SMA NU 2 Gersik. *Jurnal Ilmiah Wahana Pendidikan* 2023; 9(12): 539-48.
15. Wahyuningsih, I., Syahra R. Pengetahuan dan perilaku safety riding siswa SMA. *Holistik Jurnal Kesehatan* 2020; 14(4): 567-72.
16. Waluyo, B., Prasetyo H, Subakdi, S. Pembangunan Budaya Kesadaran Berkendara Sepeda Motor Yang Aman di Kalangan Pelajar SMAN 66 Jakarta. *SABDAMAS* 2019; 1(1): 315-9.