

## Parents' Perception on the Potential of Cycling as a Transport Mode to School

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**Abstract:** This study focuses on parents' perception on the potential of cycling to school as the means of transportation in Taman Medan, within the Petaling Jaya Municipal area in Selangor, Malaysia. Two hundred and fifty five (n = 255) respondents whom participated in this study. Chi-square test were conducted to explore the influence of socio demographic characteristic and to arrange the ranking of the encouraging factors for cycling, Analytical Hierarchy Process (AHP) was used. The result were found, the majority of parents agree that the physical activity is important for their children health. Most of the parents do not allow their children cycling to school, mainly because of safety issue, i.e. road accidents. The majority of parents suggested on the exclusive bike path facilities for their children cycling to school. Finally, parents will only allow their children to cycle to school if the distance is within 500 meters.

**Keywords:** potential of cycling, cycling to school, physical activity, active transport, encouraging factor for cycling.

### 1. INTRODUCTION

The decline of the active travel to school for the children were well documented, McDonald (2007) reported the decline of the active transport especially for the children to commute to school, he reported that since 1969, active transport decreased 24 %. In the UK, the percentage of the child aged 7 year olds travelling alone to school and by active transport modes decreased to 7% from 72%, in 19 years since 1971(Hillman et al., 1991; Cole et al, 2010).

Regarding their child safety in the neighborhood surroundings, the parents concern on the road safety and 'stranger danger'. Both of them are the major causes concerned by the parents to restrict their children's outdoor play and active transport (Carver et al, 2008).

Parents often preferred to drop and pick up their children to school rather than encouraging their children to walk, cycle or use public transport as the result knowing other families are no longer encouraging to use those active transports (Carver et al, 2008).

Due to the concerned about road safety and the crime, many children are dropped and pick up of their activities at the school in order to protect them. Moreover, ‘chauffeur’ of children to school were the attempted by parent to avoid their children from risk and injury (Timperio et al, 2004). In line with the findings of Timperio et al. (2004); Hillman et al. (1990) and Carver et al, (2008), they stated that the parents give the restriction on their children physical activity due to the concerned of the possibility their child injury. Timperio et al in 2004 stated regarding the issues of safe active transport conditions, the parental perceptions were have the negative correlation with 10 - 12-year-old children’s active transport to their destination.

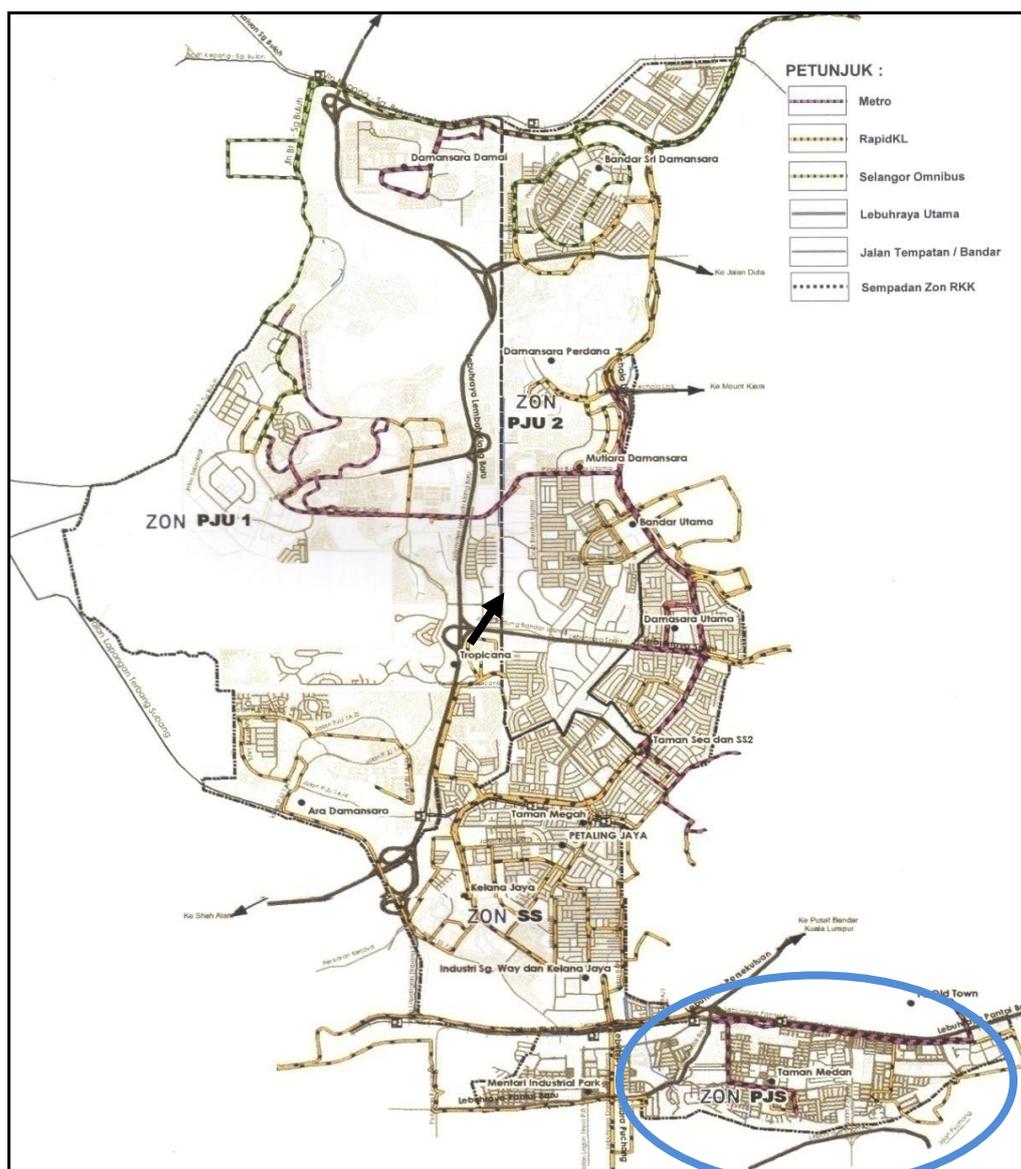


Figure 1. The map of study area

The parents' protections for their children to be safe along the journey to the school are likely had contributing the low level of active commuting. The parents safety concerned were mostly related to dangers from traffic (Isler et al, 2008). The study by Hillman et al. (1990) and Carver et al (2008) suggested that parent’ concerns about road safety result in the restriction of their children in the traveling alone from school to their home. Further research is needed to objectively measure neighborhood road safety by analyzing road characteristics

and traffic calming measures in detail, and to examine its influence on children's physical activity and active transport. Carver et al, 2008

Table 1. Socio-demographic data of respondents

Demographic characteristic	All respondents
<b>Gender</b>	
Female	61.3%
Male	38.7%
	100.0%
<b>Marriage status</b>	
Married	97.3%
Divorced	3.1%
	100.0%
<b>Occupation</b>	
Government employee	27.7%
Trading	23.0%
Private	39.1%
Housewife	7.0%
Retired	3.1%
	100.0%
<b>Age</b>	
< 30 years old	4.7%
30 – 40 years old	43.8%
40 – 50 years old	29.7%
> 50 years old	21.9%
	100.0%
<b>Income</b>	
< 1000	12.9%
1000 - 3000	44.9%
3000 - 5000	22.3%
> 5000	19.9%
	100.0%
<b>The number of children</b>	
1	6.5%
2-4	52.9%
5-6	32.3%
>6	8.4%
	100.0%

This study focuses on the potential of cycling as a means of transportation for the children to go to school within Taman Medan areas based on parents perception. This area is in Petaling Jaya (PJ). Petaling is a satellite township for Kuala Lumpur. The area consist of mostly residential and some industrial areas. The location is in the Petaling district of Selangor with an area of approximately 97.2 km<sup>2</sup>. (Figure 1).

The field surveys were undertaken in this study. A set of questionnaire was prepared and distributed to the respondents in this area. Two hundred and fifty five (n = 255) respondents participated in this study. There is 61.3% males and 38.7% females (Table 1).

Chi-square tests were conducted to explore the influences of the socio economic characteristic, and the Analytical Hierarchy Process was utilized to arrange the ranking the encouraging factors for cycling.

Respondent's ages are placed in 4 groups. As presented in Table 1, the majority age of respondents is between 30 and 40 years old (43.8%), followed by 40-50 years old (29.7%), more than 50 years old (21.9%) and under 30 years old (4.5%). Moreover the majority of respondent is married (90.2%). There are five categories of respondent's occupation in this study, namely under the trading (23.0%), private (31.9%), housewife (7.0%), government employee (27.7%) and retired (3.1%). As shown in **Table 1**, the highest of income level is between 322.06 and 966.18 USD (44.9%), followed by 966.18 – 1610.30 USD (22.3%), less than 322.06 USD (12.9%), and more than 1610.30 USD (19.9%).

The number of children ownership was summarized in Table 1, most respondents have two to four children (52.9%), followed by five to six children (32.3%), more than six (8.4%) and one child ( 6.5%).

## **1. THE IMPORTANCE OF PHYSICAL ACTIVITY**

As one of transportation mode, the bicycle is an active transport. Cycling has the health benefit for the user. But It needs more good of fitness to use that means of transport. Therefore the youth likes cycling more.

Regarding the cycling to school for the children, actually there are many children are willing to do that, unfortunately, most of the parents do not allow their children cycling to school. In their research Gatersleben et al in 2001 stated that almost one-third of the children were willingness to cycle to school, nevertheless, only 1 % of them can do that.

Parents have the big role why the children can not realize the willingness to cycle. Many consideration cause parents do not allow. The accidents and crime concerned along the route to school can be the reason why the parents do not allow their children to school.

Parents are actually aware that cycling as the physical activity is essential for the health of their children. It can be the beginning of the realization of the willingness to cycle to school for their children. But it must be supported with some factor such as the friendly neighborhood to do activities outside the residence, the safe and friendly environment from the accident and the crime for cycling to school.

Doing physical activity regularly for children and youth is very important for their health (Buliung et al, 2009). According Chriqui et al in 2012, ideally, 60 minutes of physical activity should be spent every day.

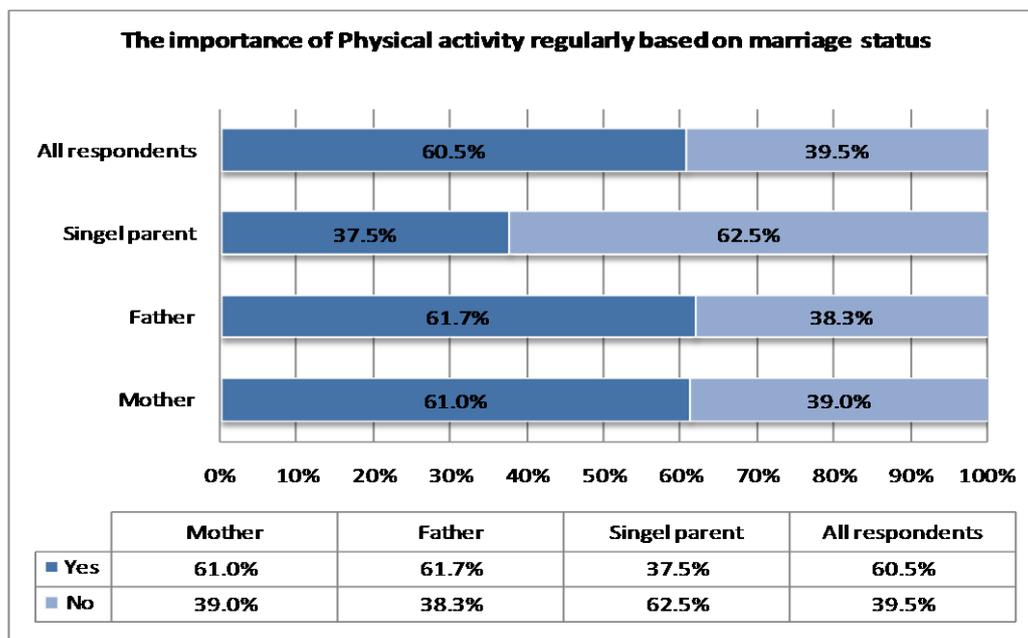


Figure 2. The importance of physical activity based on the position in family

In this research, the parents were asked regarding the importance of physical activity for their children's health. Most of the parents agree that the physical activity regularly is important for their children health. The fathers agree more than mothers, but the difference is slightly. It can be seen in Figure 2, there is 61.7 % of fathers agree that the physical activity regularly is important for health, while 61.0% of mothers agree. Most of single parents disagree that the physical activity is important for their children's health (62.5%). There is no significant influence of the respondents marriage status toward the parents perception on the importance of physical activity for their children health,  $\chi^2_0 = 1.847 < \chi^2_{0.05 (2)} = 5.991$ .

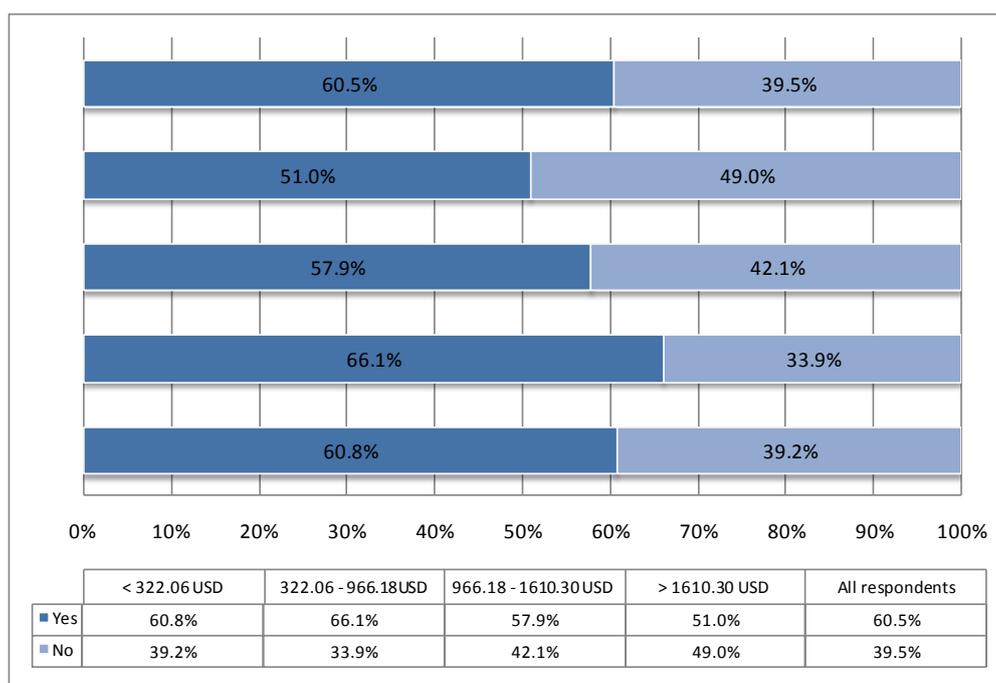


Figure 3. The importance of physical activity based on income level

Figure 3 shows the correlation of parent’s level income towards the perception of the physical activity are importance for their children. Based on income level, most of respondent agree that the physical activity regularly is important for their children health. There is no consistent pattern among the income level towards the importance of physical activity perception.

The interesting result is the consistent pattern occurred for the respondents earned more than 322.06 USD. The parents who agree the physical activity is importance for their children decreased as the increasing of respondent income level. There is no significant influence of the income level towards the parents perception of the importance of physical activity for their children health,  $\chi^2_0 = 3.599 < \chi^2_{0.05 (3)} = 7.815$ .

## 2. NEIGHBORHOOD ENVIRONMENT SAFETY FOR PHYSICAL ACTIVITIES

Figure 4 shows the parents perception regarding their neighborhood surrounding safety for their children doing the physical activity outside. As presented in Figure 4, 48.4% of parents stated that their neighborhood surrounding is safe for their children. Most of father stated that their neighborhood environment is safe ( 60.2%), while the majority of mothers and single parents sated that their neighborhood environment is not safe (58.0% and 56.0%).

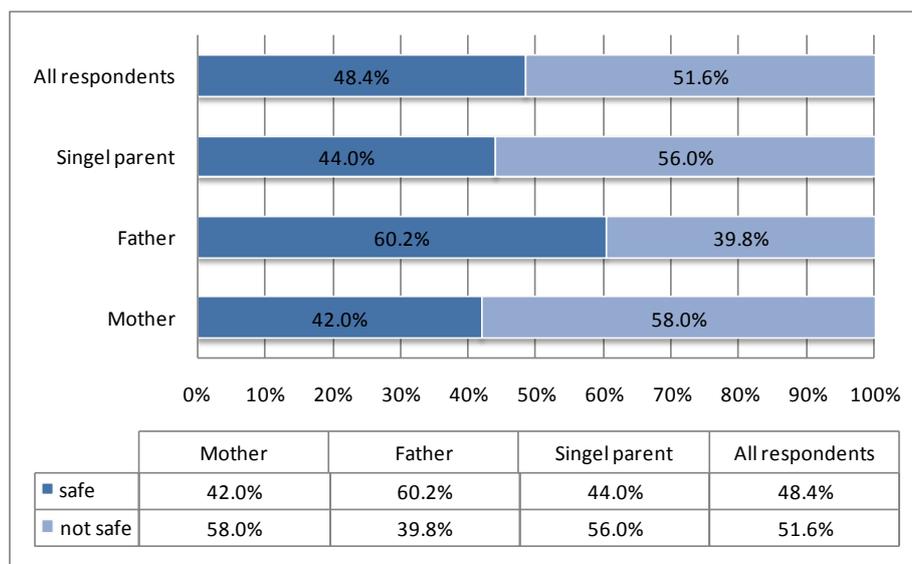


Figure 4. The the perception of neighborhood environment safety

The percentage of father who answered safe is higher than mother said. Based on Chi-square test, there is the significant influence of the position in the family toward the perception of neighborhood environment safety,  $\chi^2_0 = 7.498 > \chi^2_{0.05 (2)} = 5.991$ .

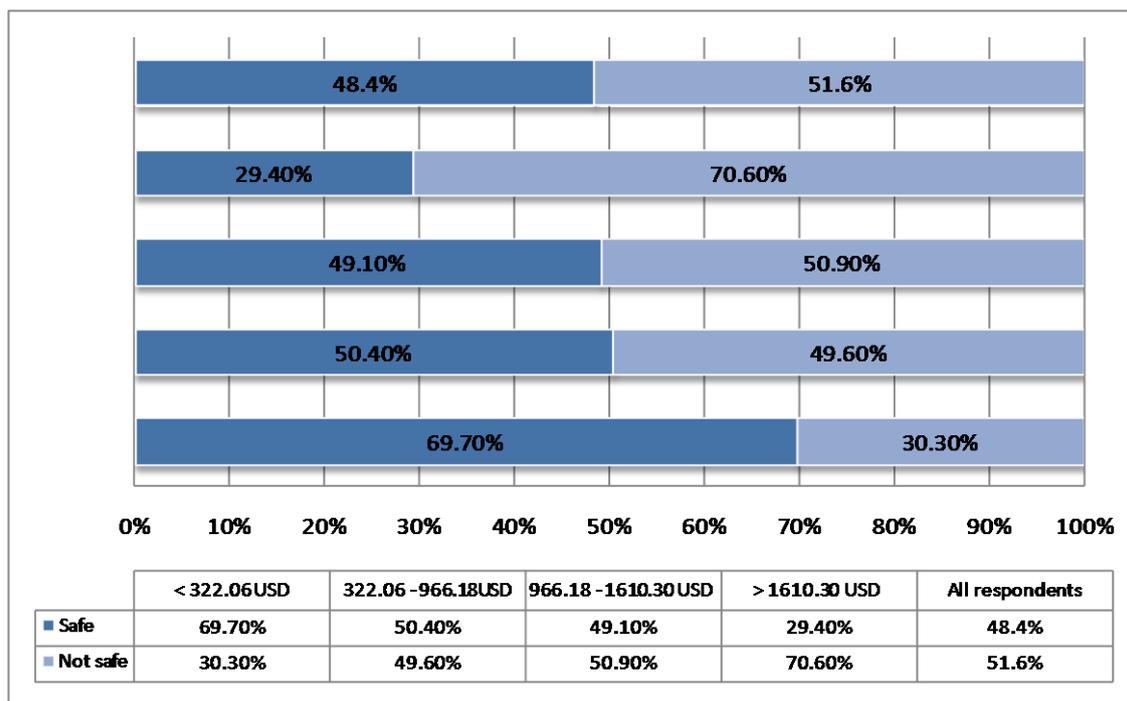


Figure 5. The perception of neighborhood t safety based on income level

Figure 5 presents the correlations of parent’s level income towards the perception of the neighborhood surrounding are safe or not safe for physical activity outside. There is the consistent pattern of the respondents’ income level toward the perception of the surrounding neighborhood safety perception. The parents who stated the neighborhood environment is safe decrease as the income level increased. Based on Chi-square test, there is the significant influence of the income level toward the perception of neighborhood environment safety,  $\chi^2_0 = 13.558 > \chi^2_{0.05 (3)} = 7.815$ .

As can be seen in Figure 5, the percentage of the parents earned income 966.18 USD below who stated the neighborhood surroundings is safe are higher than the percentage of the parents earn income more than 966.18 USD. The difference is significant. Moreover, the percentage of the parents earned income 966.18 USD below who stated the neighborhood surroundings is safe are higher than “not safe”. While the parents earn income more than 966.18 USD who stated the neighborhood surroundings is “safe” are lower than “not safe”

Chi square test is also conducted to explore the difference between the parents earned the income less than 966.18 USD with the income 966.18 USD above, the result is the significant difference occurs between those income regarding the perception of neighborhood environment safety,  $\chi^2_0 = 5.561 > \chi^2_{0.05 (1)} = 3.841$ .

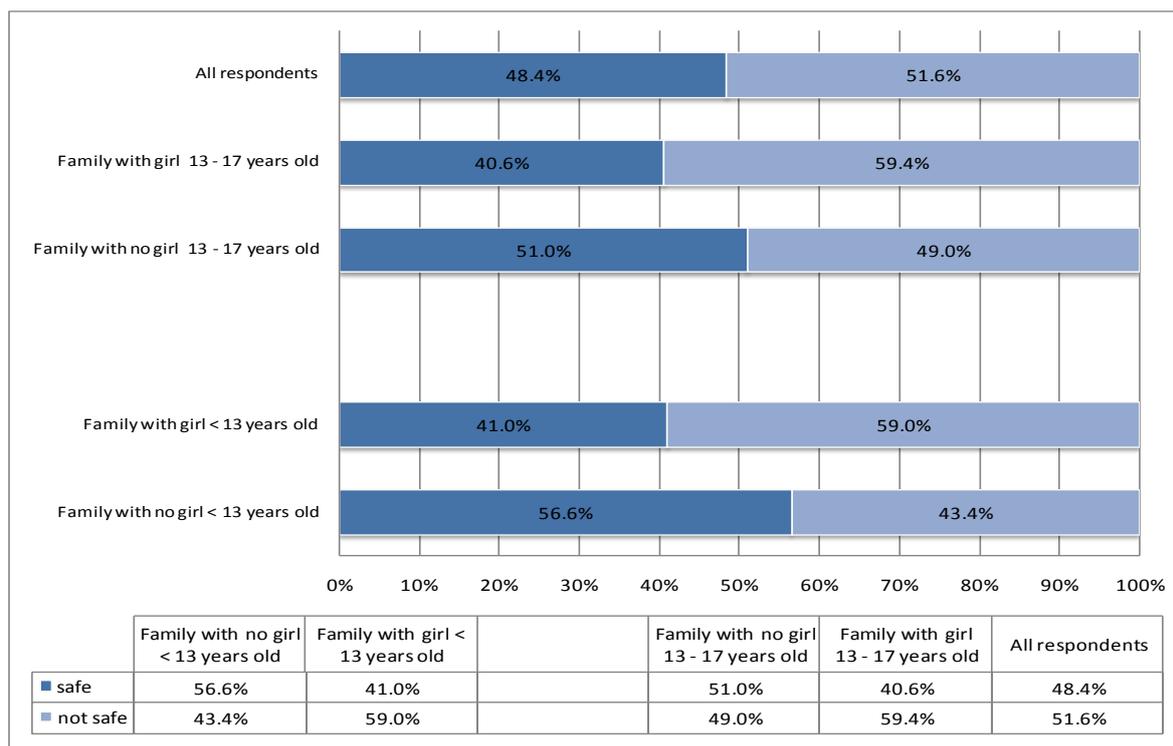


Figure 6. The perception of neighborhood environment safety based on girl ownership

As the result in this research, there is the influence of girl ownership toward the perception of neighborhood environment safety. As presented in Figure 6, most of the family who have the girl aged under 13 years old stated that their neighborhood is not safe (59.0%). While the majority of the families haven't the girl aged more than 13 years argue that their neighborhood surrounding is safe (56.6%). Based on Chi square test the difference is significant,  $\chi^2_0 = 6.153 > \chi^2_{0.05(1)} = 3.841$ .

In Figure 6 can be seen that most of the family who have the girl aged between 13 and 17 years old stated that their neighborhood is not safe (59.4%), while the majority of the family haven't the girl aged between 13 and 17 years argue that their neighborhood surrounding is safe (51.0%). Based on Chi square test the difference is no significant,  $\chi^2_0 = 2.085 < \chi^2_{0.05(1)} = 3.841$ .

### 3. THE TRANSPORTATION MODE TO SCHOOL

As presented in Figure 7, regarding the means of transportation for their children from home to school, most of the parents would let their children taking a bus school (36.9%); followed by they drop and take them up at the school (by motorcycle, 29.2% and by car, 26.6%). Only 4.2% of parents let them take public transport and 3.6% walking. Furthermore most of the mother would let their children taking a bus school (40.4%) while father prefer to use their car to drop and take them up at school by motorcycle (31.0%).

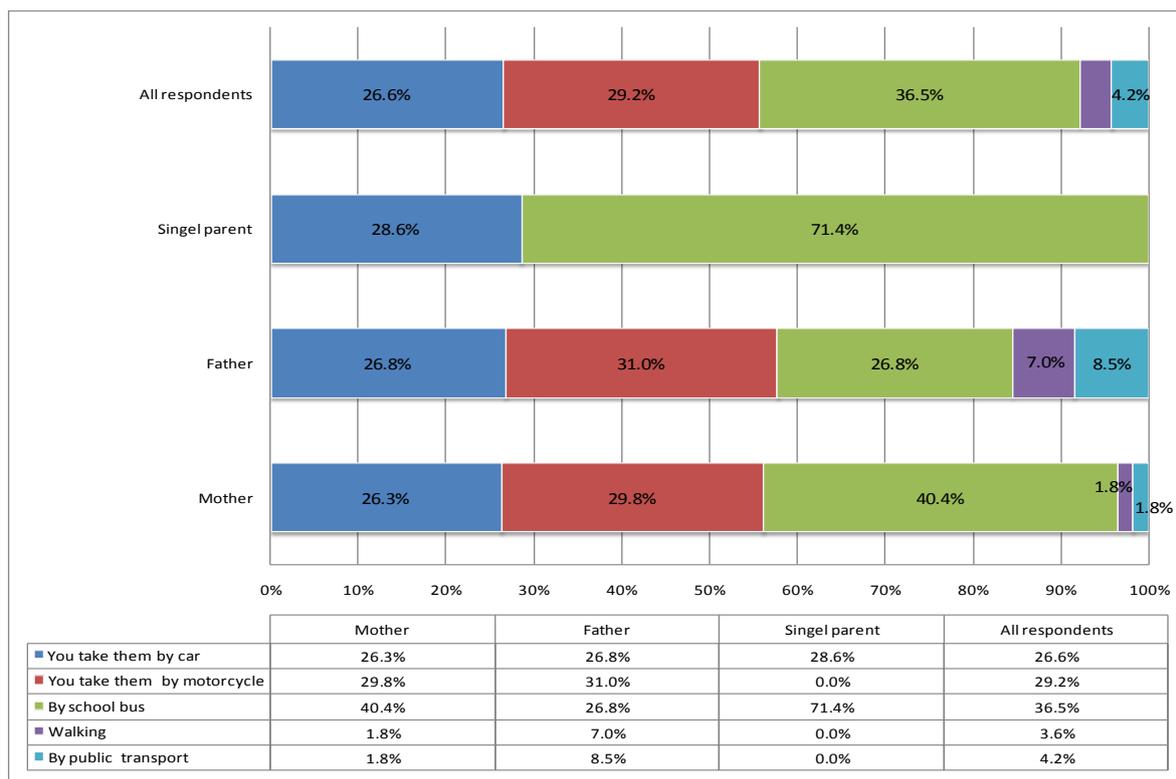


Figure 7. Transportation mode used for the children to go to school based on respondent's position in the household

Based on Chi-square test, there is no significant influence of the position in household towards the Transportation mode for the children to go to school,  $\chi^2_0 = 15.438 < \chi^2_{0.05(8)} = 15.507$ .

As presented in Figure 8, most of the parents earned the income less than 322.06 USD use motorcycle to drop and take their children at school (72.0%), while the parents earned the income RM 1000 – 3000 (41.6%) and 966.18 - 1610.30 USD (45.2%) let their children to take the school bus and the parents earned the income more than 1610.30 USD to drop and take their children at school by car (58.3%).

The consistent pattern occurs among income level toward the car and motorcycle used as transportation mode to the school. The car used increase as the increasing of income level. While as the increasing of income level motorcycle used decrease. There is no parents earned income and 966.18 - 1610.30 USD and more than 1610.30 USD let their children walking to school. Based on Chi-square test, there is the significant influence of the income level toward the Transportation mode for the children to go to school,  $\chi^2_0 = 65.564 < \chi^2_{0.05(12)} = 21.026$ .

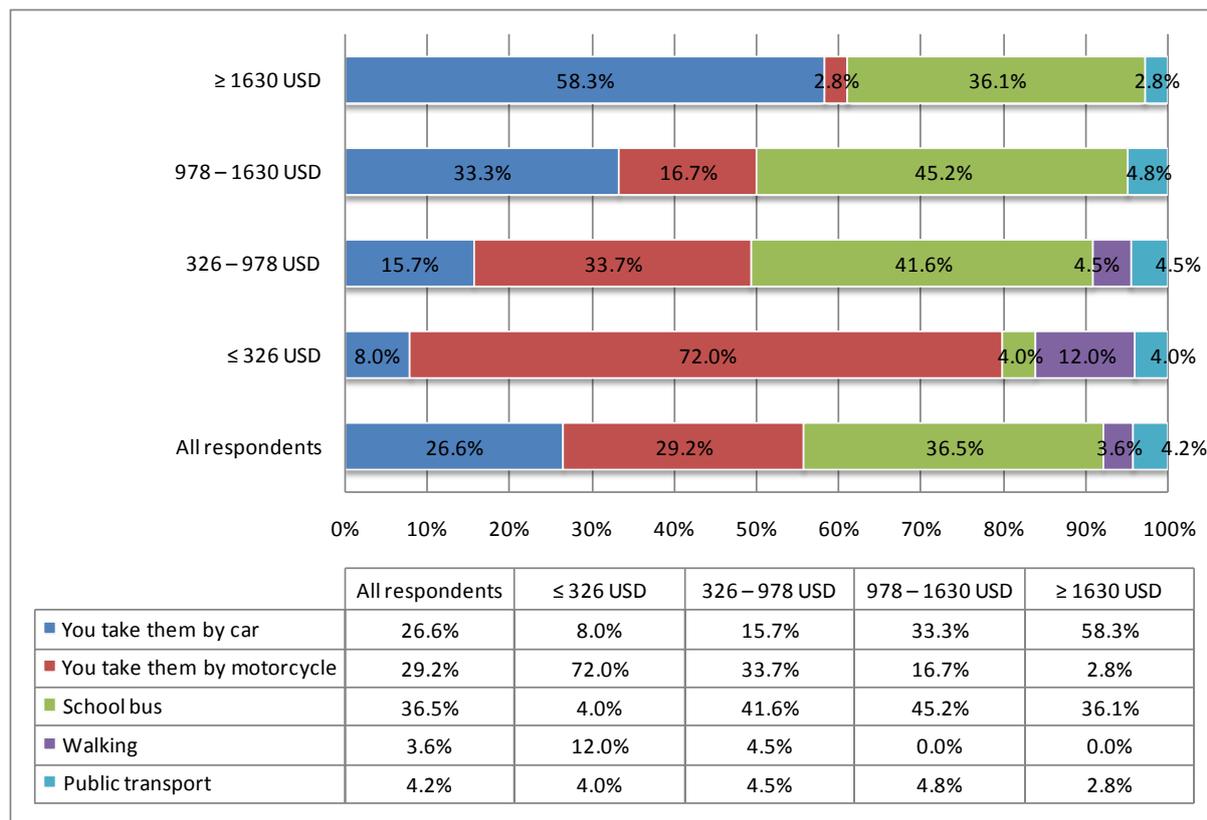


Figure 8. Transportation mode for the children to go to school based on income level

As presented in Figure 9, regarding the means of transportation for their children from home to school, except the family with no girl < 13 years old, most of the parents let their children taking a bus school. Based on Chi-square test, there is no significant influence of the girl aged < 13 years old ownership toward the transportation mode for the children to go to school,  $\chi^2_0 = 9.315 < \chi^2_{0.05(4)} = 9.488$ . There is no significant influence of the girl aged 13 – 17 years old ownership toward the transportation mode for the children to go to school,  $\chi^2_0 = 11.238 > \chi^2_{0.05(4)} = 9.488$ .

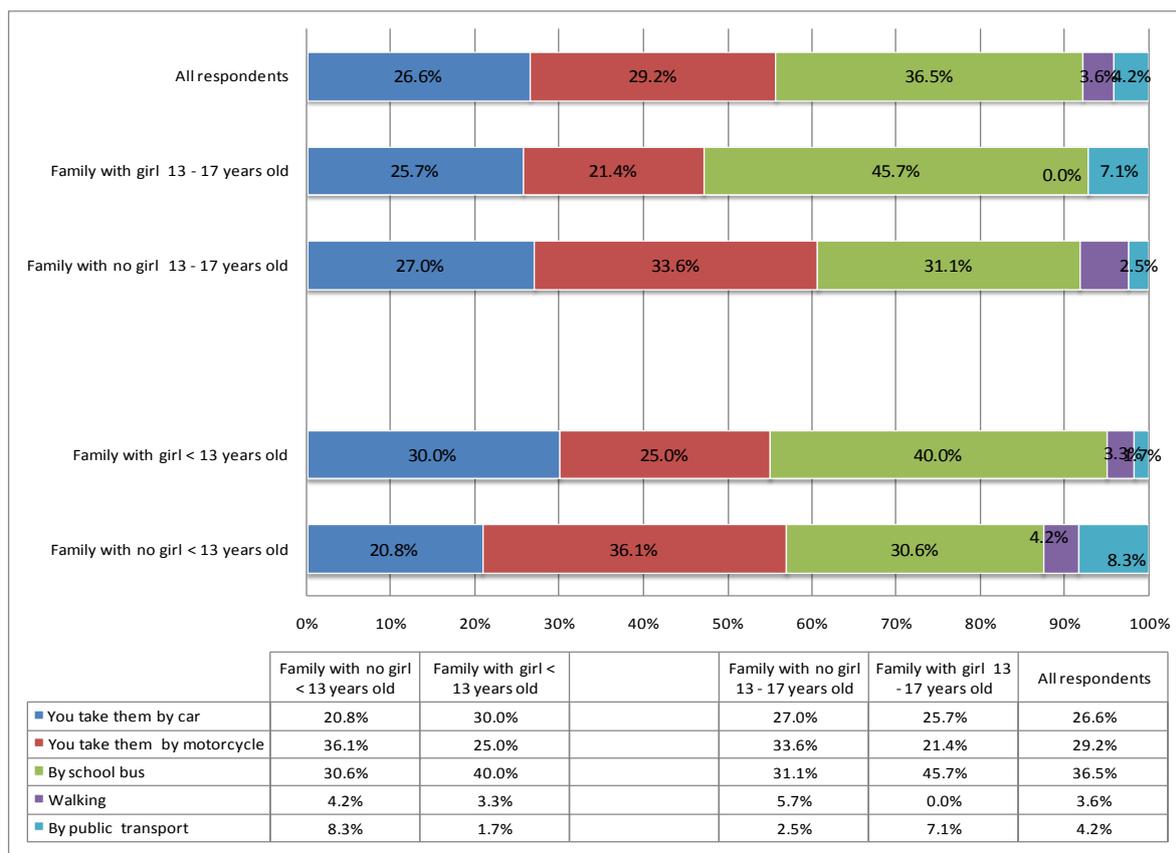


Figure 9. Transportation mode for the children to go to school based based on girl ownership

#### 4. PARENTS' PERMISSION ON CYCLING TO SCHOOL

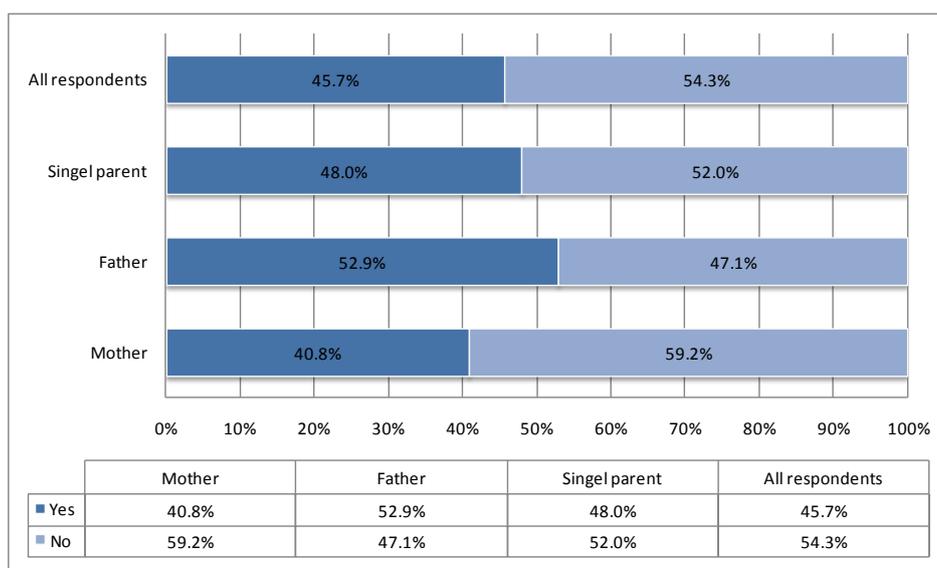


Figure 10. Bicycle ownership

Survey results in Figure 10 reflect the parents slightly more do not allow their children own the bicycle (54.3% compared to 45.7%). Most of mothers do not allow their children

have their own bike (40.8%), while the majority of father allow (52.9%). Based on Chi-square test, there is no significant influence of the position in household towards the permitted having the own bike,  $\chi^2_0 = 3.206 < \chi^2_{0.05 (1)} = 3.841$ .

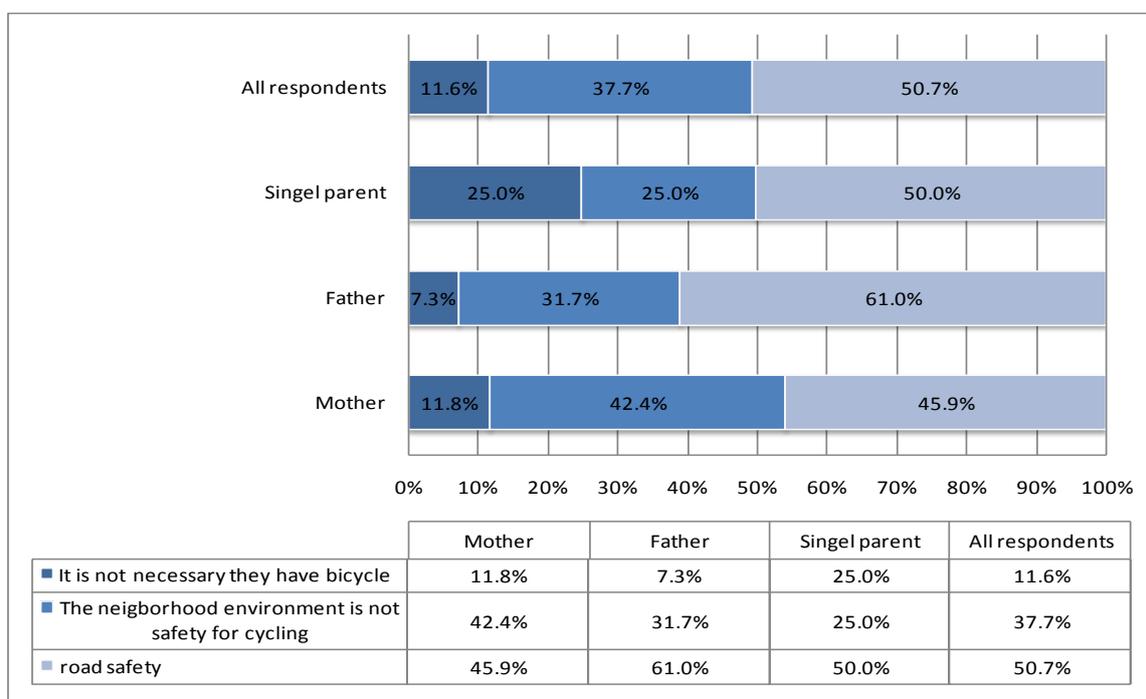


Figure 11. The reasons why parents do not allow their children have their own bicycle

In Figure 11 can be seen that, the main reason why the parents to not allow the children having their own bicycle due to the road safety (50.7%), followed by the neighborhood is not safe for cycling (37.7%) and they argue that is not necessary for children own the bike (11.6%) . Most of father and mother concern about the road safety (61.0%;45.9%). Based on Chi-square test, there is no significant influence of the position in household toward the reason parents do not allow their children having the own bike,  $\chi^2_0 = 5.145 < \chi^2_{0.05 (4)} = 9.488$ .

As presented in Figure 12, Most of the parents do not allow their children cycling to school (76.8%). The percentage of father who allow for cycling is higher than mother (26.7% compare to 19.6%).

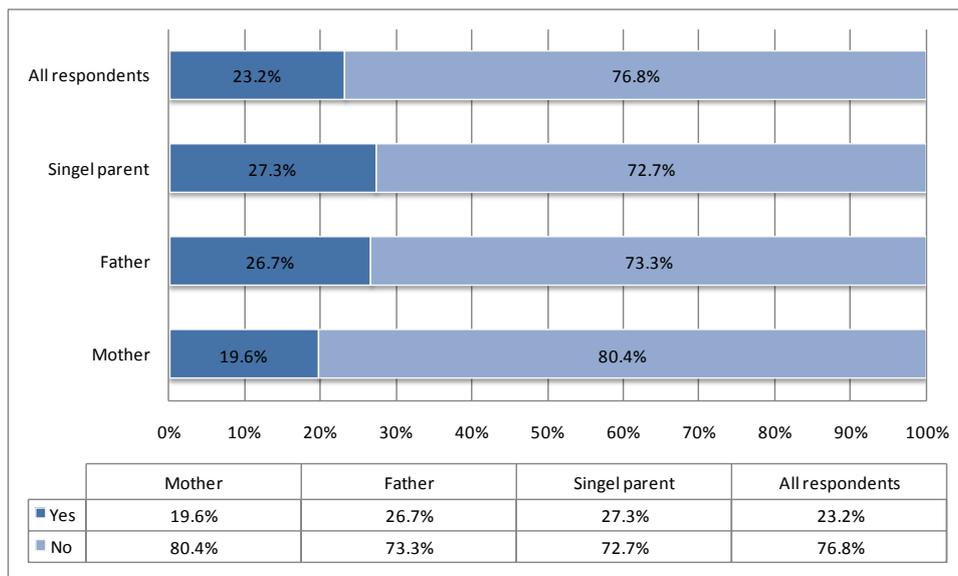


Figure 12. The parents' permission for cycling to school

Based on Chi-square test, there is no significant influence of the position in household towards the permission for cycling to school,  $\chi^2_0 = 0.803 < \chi^2_{0.05 (2)} = 5.991$ .

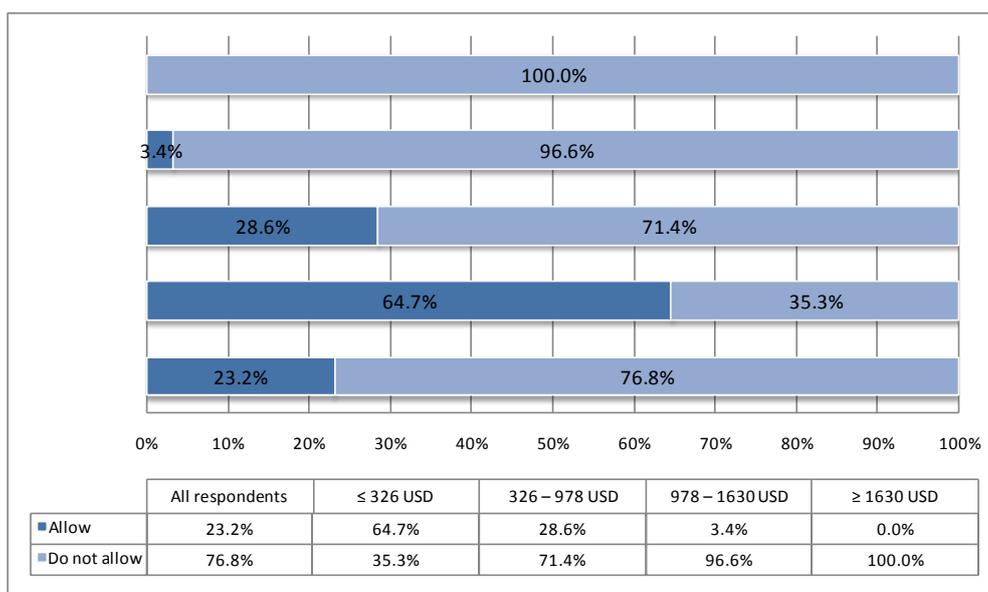


Figure 13. The permission for cycling to school

Figure 13 shows the correlation of parent's level income toward the permission for cycling to school. There is the consistent pattern between the parent's income levels toward the permission for cycling to school. The permitted decreased as the income level increased. Based on Chi-square test, there is the significant influence of the parent income level toward the cycling permission to school,  $\chi^2_0 = 28.703 > \chi^2_{0.05 (3)} = 7.815$ .

As presented in Figure 14, the parents who have the girl < 13 years old do not allow their children for cycling to school more than the parent who don't have. While the parents who have the girls aged 13-17 years old do not allow their children for cycling to school lower the parent who don't have

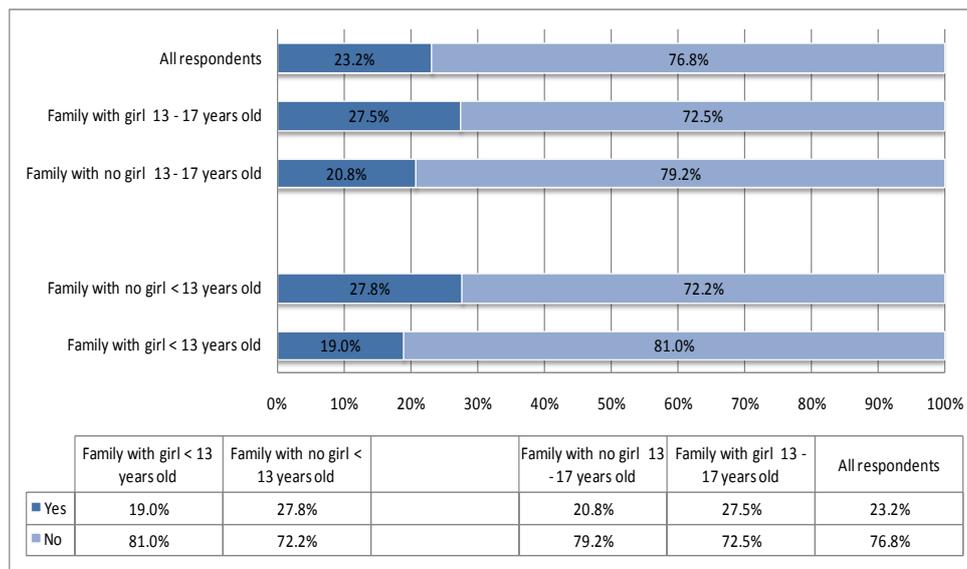


Figure 14. The permitted for cycling to school based on girl ownership

Based on Chi-square test, there is no significant influence of the girl < 13 years old and the girls aged 13-17 years old toward the permission for cycling to school,  $\chi^2_0 = 1.218 < \chi^2_{0.05 (1)} = 3.841$ ,  $\chi^2_0 = 0.641 < \chi^2_{0.05 (1)} = 3.841$ .

### 5. THE ENCOURAGING FACTORS FOR CYCLING TO SCHOOL

In this research the parent were asked regarding the factor that can encourage them to allow their children cycling to school. The data analyses were conducted by using the Analytical Hierarchy Process.

Table 2. Encouraging factors for cycling to school

Rank	The impediment factor	Weight
1	The distance from your house to school is not far	14.87%
2	Adequate and safe cycling facilities along the route to school	14.68%
3	Safety neighborhood environment for children	13.89%
4	Need separate path for cycling	13.86%
5	The crossing guard along the cycling route	11.87%
6	Need helmet for your children	11.38%
7	Need bicycle facilities (bicycle parking area)	9.76%
8	Speed zones along the cycling route	9.69%

The result can be seen in Table.2 and Table 3. In Table 2 can be seen that, the main factor that can encourage the parents to allow for cycling is the distance. The parents ranked the adequacy and safety route in the second place and the safety neighborhood environment in the third place.

Table 3. Encouraging factors for cycling to school based on the position in family

Rank	Father	Weight	Mother	Weight
1	The distance from your house to school is not far	14.80%	The distance from your house to school is not far	14.91%
2	Adequate and safe cycling facilities along the route to school	14.60%	Adequate and safe cycling facilities along the route to school	14.73%
3	Need separate path for cycling	14.22%	Safety neighborhood environment for children	14.08%
4	Safety neighborhood environment for children	13.56%	Need separate path for cycling	13.64%
5	The crossing guard along the cycling route	12.00%	The crossing guard along the cycling route	11.79%
6	Need helmet for your children	11.53%	Need helmet for your children	11.29%
7	Need bicycle facilities (bicycle parking area)	9.92%	Speed zones along the cycling route	9.88%
8	Speed zones along the cycling route	9.37%	Need bicycle facilities (bicycle parking area)	9.67%

Table 3 shows that for father and mother have the equal view point for first rank until sixth rank regarding the encouraging factors for cycling to school. In the seventh rank father more consider the bicycle facilities (bicycle parking area) while mother more consider about speed zones along the cycling route.

## 6. FACILITIES SUGGESTED FOR CYCLING TO SCHOOL

The road safety concerned was shown by parents on the cycling facilities suggested. The concerned about the dangers from other traffic on the road is very high. As the result in Figure 17, regarding the cycling facilities, the majority of parents suggested the exclusive bike path for their children to go to school (64.1%). A few of the parents suggest on the existing road but there is must be provided the cycling lane to separate the cyclist from other traffic. No one would let their children ride their bicycle on the road mix with other traffic, most of them proposed exclusive bike path for their children.

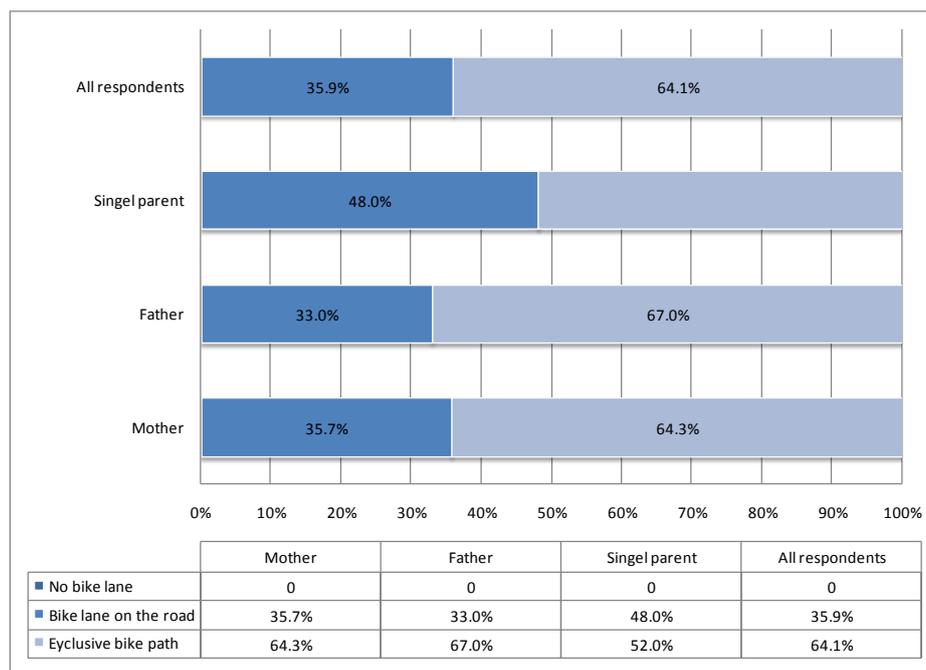


Figure 17. Cycling facilities suggested

Based on Chi-square test, there is no significant influence of respondent position in household toward the cycling facilities suggested,  $\chi^2_0 = 1.295 < \chi^2_{0.05 (6)} = 12.592$ .

## 7. THE MOTIVATIONAL FACTORS FOR CYCLING PERMISSION TO SCHOOL

As the result the parents do not allow their children to cycle to school due to their concerned about other traffic along the route from home to school. Regarding the cycling facility suggested along the route to school, the parents prefer to propose the separated cycling route from other traffic in order to avoid the conflict with another vehicle.

As can be seen in Figure 18, the parents would like to allow their children cycle to school if there are safe bicycle path along the route to school (39.8%), they also stated that the friendly neighborhoods for cycling is important for children to cycle to school (26.6%). Speed zones around schools (13.3%) and the guards in intersection to guide the children crossing the road were important (21.1%). Based on Chi-square test, there is the significant influence of the position in family toward the parents answered about the factors that encourage parents to allow their children cycle to school,  $\chi^2_0 = 28.421 > \chi^2_{0.05 (8)} = 15.507$ .

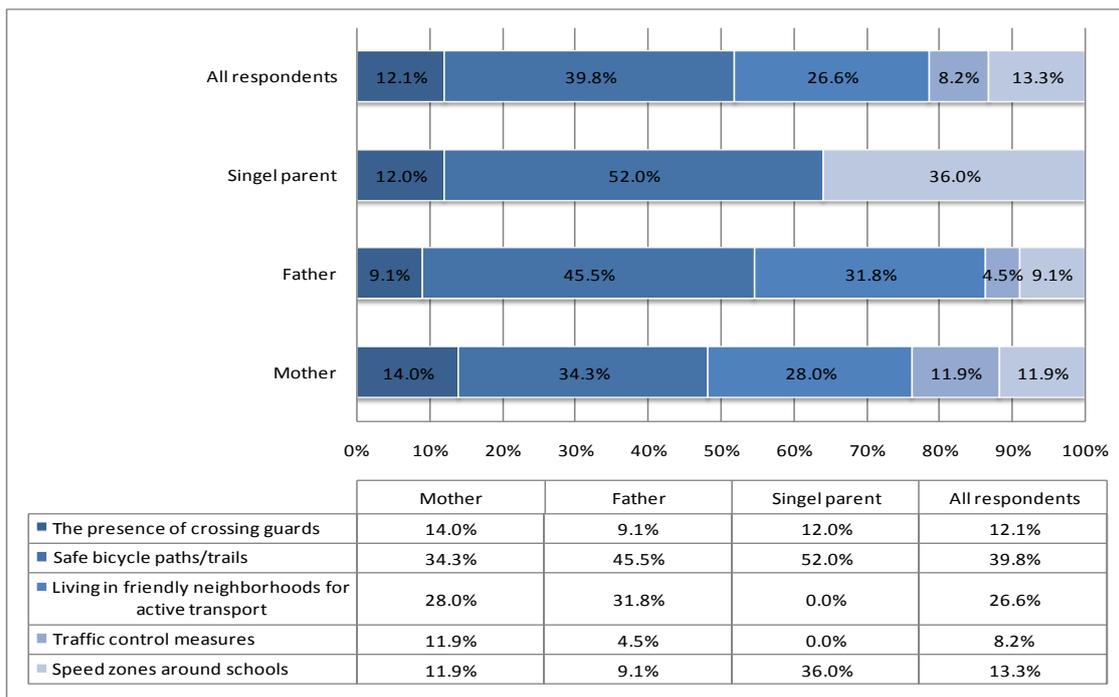


Figure 18. The factors that encourage parents to allow their children cycle to school

Fathers expect the friendly neighborhood for active transport in order to encourage them to allow their children to cycle to school, followed by the presence of the guard to help their children across the street. While mothers more concern about the availability of safe cycling path.

### 8. THE PERMITTED DISTANCE FOR CYCLING TO SCHOOL

Figure 19 shows that most of the parents only allow their children cycling to school within 500 meters (75%). No on the parents allow their children cycle more than 750 meters.

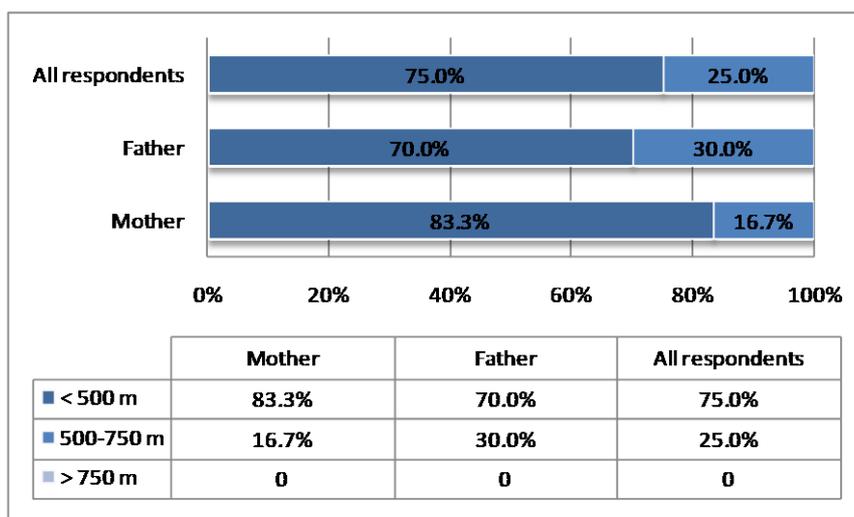


Figure 19. The permitted distance for cycling to school

Figure 19 also the fathers allow their children cycling further than the mothers. The

percentage of father allowed the children cycling to school with the distance more than 500 meters are higher than mother

## 9. CONCLUSION

1. As the result of the research, the majority of the parents agree that the physical activity regularly is important for their children health.
2. The majority of parents stated that their neighborhood surrounding is not safe for their children doing the physical activity alone outside home alone. The interesting results is most of the fathers argue the neighborhood surrounding is safe while most of mothers and single parents sated that their neighborhood environment is not safe. There is the significant influence of the position in the family towards the perception of neighborhood environment safety.
3. The consistent pattern occurs on the income level towards the perception of the surrounding neighborhood safety perception. There is the significant influence of the position in the income level on the perception of neighborhood environment safety.
4. Most of the family who have the girl aged less than 13 years old stated that their neighborhood is not safe. While the majority of the families haven't the girl aged more than 13 years argue that their neighborhood surrounding is safe. The difference is significant.
5. The road safety is becoming the main reason why the parents to not allow the children having their own bicycle due to the road safety. There is no significant influence of the position in household toward the reason parents do not allow their children having the own bike.
6. Most of the parents do not allow their children cycling to school. The percentage of father who allow for cycling is higher than mother. There is no significant influence of the position in household toward the permission for cycling to school. The consistent pattern between the parent's income level toward the permission for cycling to school. The permitted decrease as the increasing of income level. There is the significant influence of the parent income level toward the cycling permission to school. The parents who have the girl do not allow their children for cycling to school more than the parent who don't have.
7. Most of the parent do not allow due to concerned about road accident. The father more concerned road accident, while mother more concerned about the crime. There is no significant influence of respondent position in household toward the Transportation mode for the children to go to school. Based on income level, most of the parent do not allow due to concerned about road accident. Except the reason of the distance, no consistent pattern amongst income level toward the reason. There is no significant influence of respondent income level toward the Transportation mode for the children to go to school.
8. The road safety concerned was shown by parents by the cycling facilities suggested. The concerned about the dangers from other traffic on the road is very high. Regarding the cycling facilities, the majority of parents suggested the exclusive bike path for their children to go to school. A few of the parents suggest on the existing road but there is must be provided the cycling lane to separate the cyclist from other traffic. No one would let their children ride their bicycle on the road mix with other traffic, most of them proposed exclusive bike path for their children.

9. As the result the parents do not allow their children to cycle to school due to their concerned about other traffic along the route from home to school. Regarding the cycling facility suggested along the route to school, the parents prefer to propose the separated cycling route from other traffic in order to avoid the conflict with another vehicle.
10. The parents would like to allow their children cycle to school if the distance is not too far. The followed rank is the factor regarding the safety i.e. adequate and safe cycling facility, the safety neighborhood environment for cycling, the separated path and the guard at the cross section. Most of the parents only allow their children cycling to school within 500 meters. The fathers allow their children cycling further than the mothers. The percentage of father allowed the children cycling to school with the distance more than 500 meters are higher than mother.

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