Assessment of Priority Parental Anxiety Index for School Zone Improvement during Drop-off and Pick-up Time around Primary Schools in Thailand

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Abstract

Road accidents and environmental hazards around school zones cause anxiety to parents when dropping-off and picking-up their children and affect behavioural problems, traffic congestion in cities that lack public facility plans. Improving the school environment as an urgent problem is one of the problem-solving methods. 1,466 questionnaires were distributed to parents by teachers. The probability was evaluated by simple random sampling and selected by teachers on the class numbers of students. The 6 schools were the representatives of 6 regions of Thailand, considered by schools with the highest accident rate among children. The Priority Parental Anxiety Index (PPAI) was developed from the Priority Needs Index (PNI) to prioritize guidelines for improving the school environment based on current anxiety compared to the anxiety improved. The parental anxiety was at a moderate to a high level especially regarding the danger of road accidents at the school zone. The PPAI was at -0.427. This showed that environmental improvement guidelines can be applied to child safety especially an improvement connecting paths between parking lots and student drop-off and pick-up zones, road crossings and roofs as well as facilities, management, and security policy. Finally, the parents are concerned about assisting children more than planning, safety measures, and equipping children's skills.

Keywords: Parental anxiety, Children safety, Drop-off and pick-up behaviour, School zone, Thailand.

Introduction

A major cause of traffic congestion in Thailand as reported in many cities is from the student drop-off and pick-up times at school zones. Since the quality and popularity of primary schools in compulsory education are different, parents are often willing to travel further afield to send their children to better-quality schools in town instead of sending them to schools in their neighbourhood (Sattanon, K, Upala, P, 2017). Previous statistics demonstrate that the risk of losing children can take place at schools. It can be said that the traffic danger and child loss could take place in a school zone that may be considered to be a risk area for child safety (The Mirror Foundation, 2015). Compared to other countries, parent's drop-off and pick-up behaviour in Thailand is different due to the anxiety of child safety. Parental safety anxiety and the school environment are important factors affecting child safety (McLaren, L., Hawe, P., 2005; Ghasrodashti R.E., Ardeshiri M., 2015). Child Safety Solutions in the absence of spatial infrastructure planning, poverty of the School Catchment Area and lack of funds to improve the school zone are key factors. To solve the problem in this case, the priority of improvement should be taken into account. A gap between the current parental anxiety and decreased anxiety after the environment has improved is

analysed and created as an indicator called Priority Parental Anxiety Index based on Need Assessment. The objectives of this study were to 1) explore the risk areas and risk time within school zone. 2) Investigate parental anxiety levels affected by the relevant factors. 3) To propose appropriate guidelines for a safe physical environment improvement for students in kindergartens and primary schools and reduce parental anxiety when picking their children up and dropping them off.

Literature Review

Child Safety

As childhood is an important development stage, primary consideration should be placed on it (Maslow, 1945). Children aged between 4-12 years old, could be considered as part of early childhood. Children in this age range are not able to care for their own safety and protect themselves from danger when encountering a new environment (Ministry of Education, 2546). Caring and assistance for such safety are on parent's and caretakers' responsibility. The sense of safety among children is improved by learning from parents, families and the environment and takes place in the first period of life as it is the perception of danger from a child's environment (Erikson, 1968; Bowlby, 2008; Kerns & Brumariu, 2014). This shows that whether children perceive self-protection positively or negatively depends on the childhood experiences they have through the environment (Liao, Hu, & Zhang, 2014). This is in line with a Californian study about environmental improvements for walking, sidewalks and traffic control. The study states that such measures enable children to feel more confident when walking to school (Boarnet, M. G., Anderson, C. L., Day, K., McMillan, T., & Alfonzo, M., 2005).

Parental Anxiety

Parental anxiety refers to the emotional state reflecting fear of danger, which is caused by individual and environmental factors and can have an effect on behaviour. This present study was conducted to find an approach to develop school safety zones and reduce parental anxiety in picking up and dropping off their children at primary school. The levels of parental anxiety were assessed and prioritized. The factors that could reduce parental anxiety were studied, including 1) the school zone such as traffic accidents, pedestrian quality, pedestrian barriers, and the pick-up and drop-off areas, 2) the school environment such as buildings and learning space, circulation, toilet facilities, and activity spaces, 3) social interactions among students, teachers, and parents, 4) school management including traffic within the school, child kidnap protection, school policy and the system of caretakers, 5) school facilities such as parking, traffic signs, safety facilities, and service points, 6) personal factors such as the understanding of safety, and participation in security activities, 8) weather, can be summarized as follows:

School Zone (SZ.), School Environment (SE), and Risk zone (RZ): Road safety refers to safely walking or cycling on the road or sidewalks, which depends on many factors such as the amount of traffic, route safety condition, age of children, and traffic safety. It is also associated with driving speed, road width, and the parents' road safety perceptions (Merom, D., Tudor-Locke, C., Bauman, A., & Rissel, C., 2006). The research conducted in California indicated that the sidewalk environmental improvement and the traffic controlling significantly affected the parents and children's trust in walk-to-school (Boarnet, M. G., Anderson, C. L., Day, K., McMillan, T., & Alfonzo, M., 2005). In addition, the influence of urban form on children is varied according to the age range of the children. A dense residential area connected with a recreation area such as a public park is conducive to child safety and considered friendly to children. Previous studies show that child safety is affected by school environment designs including buildings,

playgrounds, and restrooms (Cummins, S. K., & Jackson, R. J., 2001; Dudek, 2001). Finally, it was found that school building layout and school boundary limitations created risk spots and blind spots that affected parental anxiety for child safety (Ruangkanchanasetr, S., Plitponkarnpim, A., Hetrakul, P., & Kongsakon, R., 2005; Sattanon, K, Upala, P, 2017)

Social interactions (SI.): Interactions among students, teachers, and parents help promote the children's walking and cycling behaviour and reduce the parental anxiety. Moreover, it is found that males and females in the same neighbourhood seem to have different perceptions of safety (Borelli, J. L., Margolin, G., & Rasmussen, H. F., 2015; Kerns & Brumariu, 2014).

School Facilities (SF.) and School Management (SM): The assistance provided by teacher rotation management, traffic management, and child safety policy is essential to child safety. The facilities and management that can enhance walking and cycling safety. They were found to help enhance walk-to-school behaviour. Structure and interconnection between urban components are indicative of safety (Kerr, J., Rosenberg, D., Sallis, J. F., Saelens, B. E., Frank, L. D., & Conway, T. L., 2006).

Personal factors: The degree of anxiety that parents and children experience reflect different life experiences that have an effect on their behaviours while the environments function as a stimulator. The anxiety of parents and children would decrease when they were in the safety zone or on routes close to their home. The children also had a greater tendency to walk or cycle to school (Timperio, A., Ball, K., Salmon, J., Roberts, R., Giles-Corti, B., Simmons, D., ... & Crawford, D., 2006). Meanwhile, the disconnection and communication between children and parents were factors that made parents worry about strangers (Timperio, A., Crawford, D., Telford, A., & Salmon, J., 2004).

Weather: The previous research revealed that the weather had an effect on the physical activities of adolescents in 2 areas of Europe. According to the field study investigating the environment of schools in Thailand, it was found that different weather conditions had a different effect on parents' behaviour and anxiety in child pick-up and drop-off, especially in the southwest coast with a tropical climate and rain all year round. The parents living in that area were seriously interested in and worried about rain and child pick-up and drop-up (Sattanon, K, Upala, P, 2017). This is similar to the findings of other research indicating that the weather was a key variable affecting the student's choices of travel (Schlossberg, M., Greene, J., Phillips, P. P., Johnson, B., & Parker, B., 2006; Müller, S., Tscharaktschiew, S., & Haase, K., 2008). Research framework presented in Figure 1.

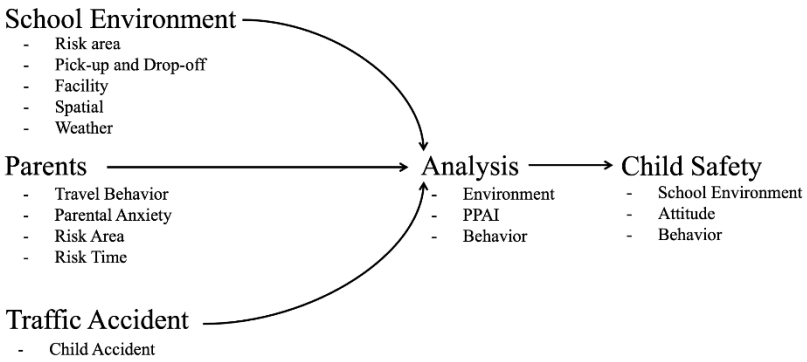

Figure 1 The relationship between variables in the study: adapted from McLaren, L., Hawe, P., 2005; Ghasrodashti R.E., Ardeshiri M., 2015; Nilsen P, Hudson D S, Kullberg A, Timpka T, Ekman R, Lindqvist K., 2004; Sattanon, K., 2017, designed by the authors.

Priority Parental Anxiety Index (PPAI)

Many studies focus on anxiety in children, focusing on the development of anxiety in children assessment to examine anxiety disorder. (Reynolds, C. R., & Richmond, B. O., 1978; Kovacs, 1981; Achenbach, 1991; Witkin, 1984). The studies also compared anxiety of boys and girls (Hosseini, L., & Khazali, H., 2013). In 1999, anxiety in children assessment was developed according to parental anxiety assessment (Spence, 1999). However, it assessed personal factors, rather than environmental factors that affect parental anxiety for child safety during drop-off and pick-up time. Improving the environment to improve safety for children requires current anxiety assessment to assess the severity of problems. A gap of anxiety is examined for the improvement of guidelines of each factor so as to prioritize the importance of problems and optimum design. Therefore, this study applied need assessment. Needs refer to what is needed but is lacking and what is wanted. Basic needs depend on two principles; 1) discrepancies that compares an actual state with a required state; 2) importance refers to needs defined by importance (Guba, 1989). There are many widely-accepted studies investigating needs (Trimby, 1979; Neufeldt, V., & Guralnik, D. B., 1988; Kaufman, R., & Stakenas, R. G., 1981; Scriven, 1991). Need solution is divided into five steps; 1) determination of what should be; 2) determination of what is; 3) discrepancy analysis from the 1st and the 2nd step and priority procedure of the results; 4) causes of discrepancy analysis and; 5) solution determination. Priority Parental Anxiety Index (PPAI) is derived from Need Analysis based on Priority Need Indexmodified (PNImodified) (Vongvanich, 2007).

$$PPAI = \frac{(f - p)}{p} \qquad (1)$$

where:

p = Current anxiety

f = Decreased anxiety when school environment is improved (in the future)

The level of necessity was determined by five levels (Likert, R., 1961).

Methods and Materials

Data Collection

Questionnaires for parents: The researcher conducted this study based upon the study of accident statistics occurring with children around Anuban Schools across Thailand. The selected schools were that of the highest accident statistic in each region. The coordinates of child accidents (latitude and longitude) within the radius of 500 meters around school zones was collected. To select six Anuban Schools (There are 65 Anuban Schools in Thailand) with the highest accident statistics based on the database of the Road Safety Culture (Sattanon, K., 2017), the child accidents coordinates in latest 4 years (2014-2017) were considered. The calculation of the number of questionnaires was based on the population of parents of children attending the selected 6 schools, 16,794 people, 8,369 male students and 8,425 female students, from 406 rooms, using Taro Yamane's population size formula, 95% confidence (Yamane, 1967). As a result, the population of this study included 1,466 parents and primary school students and kindergartens selected by probability proportion according to the systematic sampling by class teachers on the class numbers of students. The questionnaires for parents covered the 3 aspects; 1.1 parental anxiety during drop-off and pick-up time (current); 1.2 opinions toward risk area and risk

moment for children and; 1.3 parental anxiety during drop-off and pick-up time (future). The questionnaires were distributed to students in each grade. They were directed to inform their parents that the parents had three weeks to complete and return the questionnaires within the first semester in Academic Year 2018. A Likert's 5-level scale was applied in Section One and Section Three for each assessment (Likert, 1961).

Survey and interview

The researcher surveyed the school environment and interviewed school administrators to uncover actual problems related to physical problems, safety management at the schools and student drop-off and pick-up behaviour. To survey the school environment, the researcher followed 2 steps as follows. 1) The researcher conducted a primary survey of the environment and traffic safety facilities around the schools, using Google Street View to understand the environment before an actual survey (Sattanon, K, Upala, P, 2017). 2) The researcher conducted a survey of the environment of the schools during student drop-off and pick-up times in actual situations.

Study Area

The researcher selected Anuban Schools as the representatives of state primary schools and kindergartens. The researcher collected the accident statistics occurring with children at provincial level, the accident statistics occurring with children within the radius of 500 meters around Anuban Schools and the accident statistics occurring during the student drop-off and pick-up time from 65 Anuban Schools where the highest accident statistics took place in each region. Based upon the collected statistics, the researcher selected six Anuban Schools as the case study schools, consisting of Anuban Lampang, a representative of Northern Region, Anuban Phetchabun, a representative of Central Region, Anuban Nakhon Ratchasima, a representative of the North-Eastern Region, Anuban Phuket, a representative of Southern Region, Anuban Chonburi, a representative of Eastern Region and Anuban Kanchanaburi, a representative of Western Region. The research methodology presented in Figure 2.

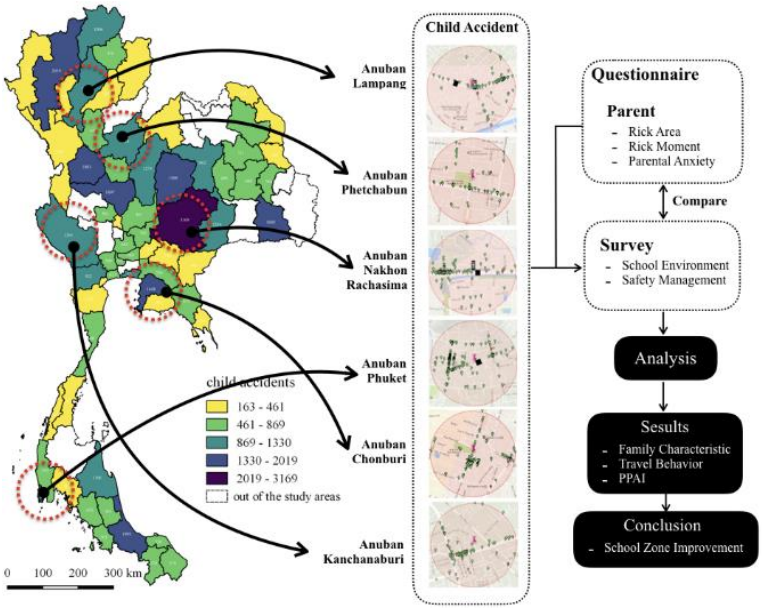

Figure 2 The research methodology.

Data Analysis

All questionnaires were tested for content validity and Construct validity using the index of Item-Objective Congruence (IOC) from 3 experts were 0.93 (Turner, 2003). Moreover, the Cronbach's alpha coefficient was 0.952 (Bland, J. M., & Altman, D. G., 1997). The statistics, which were used to measure the parental anxiety in order to improve safety zones for the children in Anuban schools, consisted of 2 groups; 1) descriptive statistics were the basic statistics used to analyse the data obtained from the questionnaire such as frequency, mean, percentage, standard deviation, and arithmetic mean, 2) inferential statistics were the statistics used to analyse the attitudes of the parents in order to find the differences of the results and prioritize the variables. The inferential statistics were tested as follows: 1.1) variance test was conducted to investigate the differences of the parents' opinions, the levels of parental anxiety. Various contexts were examined and compared at the statistical significance level of 0.05, 1.2) the Priority Parental Anxiety Index: PPAI was adapted according to the Needs Analysis and the Priority Needs Indexmodified: PNImodified (Vongvanich, 2007) and then applied to prioritize the levels of parental anxiety in child drop-off and pick-up, which were affected by school environmental factors. From the table, show the relationship between current parental anxiety and parental concerns levels if any in improving the school environment to the priority parental anxiety index (PPAI.). The analytical findings of anxiety assessment in 2 situations were calculated to identify indices with the value of 4 to -0.8. The findings can be considered as follows. The index with a positive value (+) means that such an improvement guideline is inappropriate. The index with a zero value (0) means that such an improvement guideline does not reduce parental anxiety. The index with a negative value (-) means that there is a gap between current parental anxiety and the anxiety levels when the environment improves in the future is appropriate for adoption in Thailand. The more negative the value, the more powerful and important the guideline. The matrix table demonstrates the current anxiety and the anxiety in the future and formulation is presented in Table 1.

Table 1 The Priority Parental Anxiety Index.

		The current parental anxiety								
		5	4.5	4	3.5	3	2.5	2	1.5	1
The decreased anxiety after the environment	5	0.000	0.111	0.250	0.429	0.667	1.000	1.500	2.333	4.000
	4.5	-0.100	0.000	0.125	0.286	0.500	0.800	1.250	2.000	3.500
	4	-0.200	-0.111	0.000	0.143	0.333	0.600	1.000	1.667	3.000
	3.5	-0.300	-0.222	-0.125	0.000	0.167	0.400	0.750	1.333	2.500
	3	-0.400	-0.333	-0.250	-0.143	0.000	0.200	0.500	1.000	2.000
	2.5	-0.500	-0.444	-0.375	-0.286	-0.167	0.000	0.250	0.667	1.500
	2	-0.600	-0.556	-0.500	-0.429	-0.333	-0.200	0.000	0.333	1.000
	1.5	-0.700	-0.667	-0.625	-0.571	-0.500	-0.400	-0.250	0.000	0.500
	1	-0.800	-0.778	-0.750	-0.714	-0.667	-0.600	-0.500	-0.333	0.000

Results

Demographic Data of the Questionnaire Respondents

Different environmental factors that cause danger, family lifestyles and anxiety about child safety make student drop-off and pick-up behaviour in Thailand different from other countries. Previous studies such as: Assessment of Parents' Anxiety with Regard to the Safety of Children, show that the responsibility of drop-off and pick-up falls mainly on females (Sattanon, K, Upala, P, 2017). Most parents who dropped students off and picked students up were females (mother/grandmother) and most of them were married. In addition, most of the parents had graduated with bachelor's degrees. Their average monthly income shows that most of them were well off financially. Previous studies also show that the income and educational background of parents affect the level of parental anxiety (Sattanon, K, Upala, P, 2017). Most parents dropped students off and picked them up by car or motorcycle. (Figure 3)

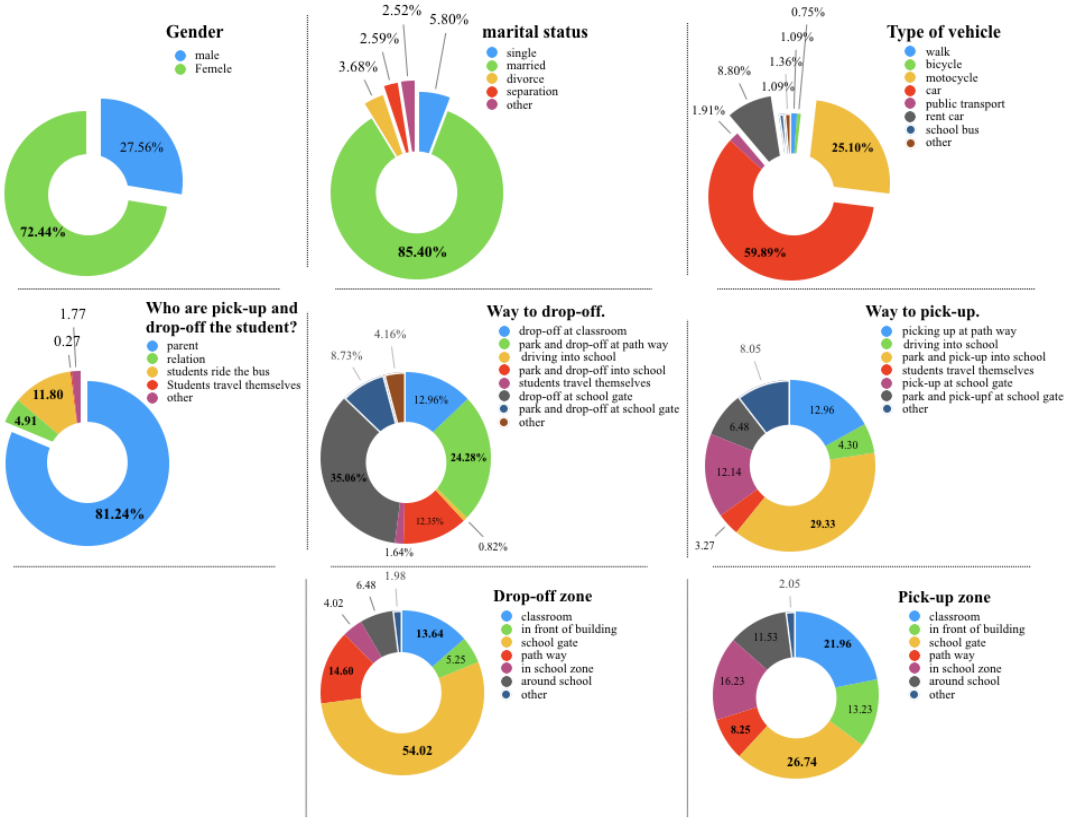

Figure 3 Family characteristics and travel behaviour

Risk area and Risk moment for children

Based on opinions of the parents towards the risk area for children, six aspects of the school environment, that the parents thought the riskiest areas were walkways and the crosswalks and the second most risky areas were the drop-off and pick-up zones, the school gates, and the school fences respectively. In addition, parents thought that the travel routes inside the schools including roads, walkways, and stairs were the riskiest areas. The parents' opinions in individual schools were consistent, except the parents' opinions at Anuban Kanchanaburi. They thought that the walkways and the crosswalks were the riskiest areas. Moreover, some parents had anxiety about blind spots behind school buildings as presented in Figure 4.

The last aspect was the parents' opinions about the riskiest moment for children. The riskiest moments for children, according to parents was the drop-off and pick-up times. The second riskiest moment for children was the after-school time (04.00 p.m.-06.00 p.m.) when it was particularly risky for children. It was found that, in individual schools, the parents' opinions were consistent. Nevertheless, the parents of Anuban Nakhon Ratchasima thought that the after-school time was the riskiest moment for children. This may be because it is the largest school in the sample. There is heavy traffic is on the main road in front of the school and the space for drop-off and pick-up is limited. The other hand, when considering the parents' and the teachers' opinions about the risk moment for children, the opinions were significantly different at < .01. The parents also considered the after-school time as a risk moment for children because it was evening. In addition, the parents dropped the students off and picked students up both inside and outside the school areas. It was the parents' responsibility to ensure child safety when going home while presented in Figure 5.

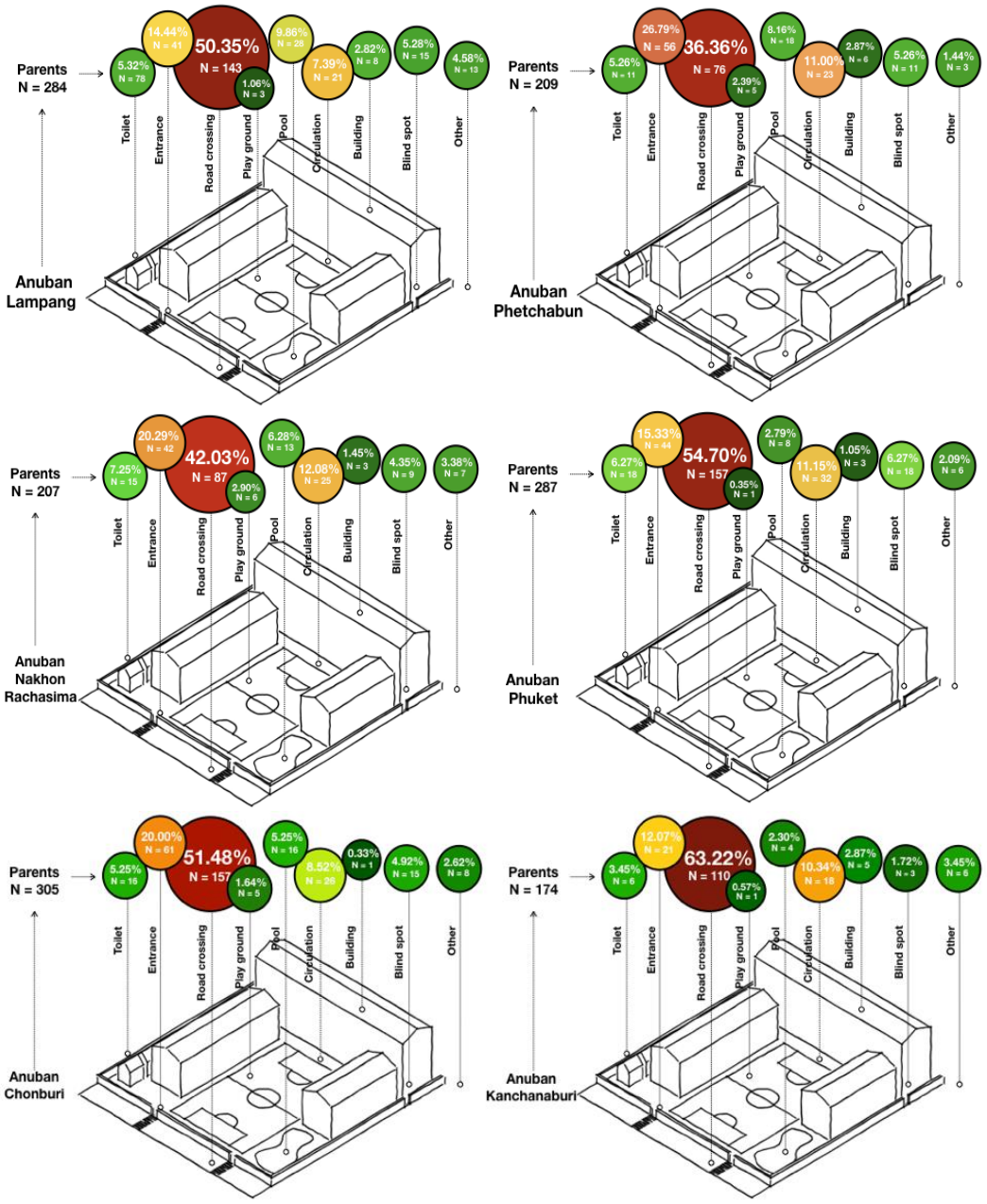

Figure 4 The risk area for children within school zone.

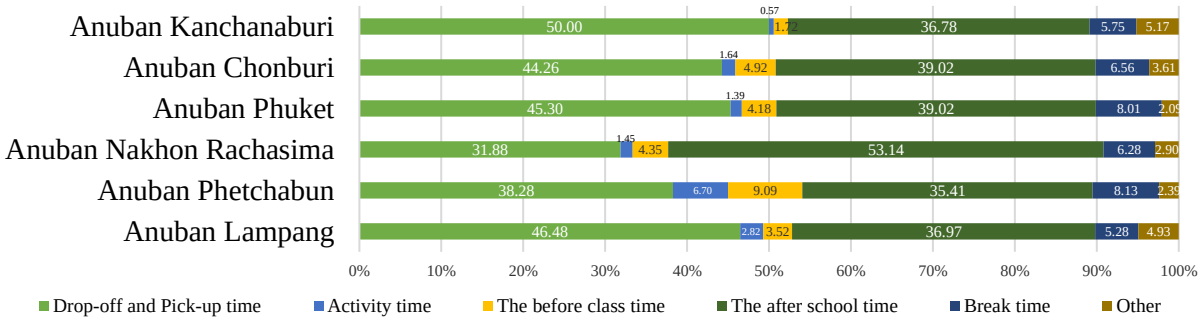

Figure 5 The risk moment for children within school zone.

Parental Anxiety

The findings of the current parental anxiety assessment through five level covering eight factors by questionnaires 1,466 in six representative schools in each region show that parental anxiety was at a moderate level to a high level at 3.57 (from 1: least anxiety to 5: highest anxiety). The highest anxiety for parents was the risk areas for children (RIC: 3.863). The second highest level of anxiety concerned the environment outside the school (SZ: 3.705). On the other hand, the lowest levels of anxiety concern social interactions between parents and teachers (PR: 3.059). This shows that interactions between teachers, parents, and students are closely related. They contacted each other through technology such as social network groups. Regarding the secondary factors, the level of parents' anxiety on traffic accidents most at 4.073 followed by (risk of access from strangers at 3.983, and risk area in the school zone at 3.927, respectively. On the other hand, parents' anxiety level on caretakers' friendship is very low at 2.943. Previous studies conducted in the Southern Region of Thailand where it rains all year round, shows that parents were concerned about the weather conditions (Sattanon, K, Upala, P, 2017). In the same way, when considering such factors such as the different weather conditions, it was found that the weather conditions were the third highest level, as presented in Figure 6.

When sub-variables of each factor are prioritized based on current interests, it was found that the highest parental anxiety was about traffic accidents around schools. On the other hand, when considering sub-variables of the first ten current anxieties it was found that the highest level of parental anxiety concerns risk areas and the second highest level of parental anxiety was about the environment outside the school and school management. In addition, parental anxiety about parking lot facilities and rainy conditions were also on the top-ten list.

Figure 6 Parental Anxiety

When considering each aspect of the parental anxiety, the following findings were found. 1) The parents are concerned about traffic accidents around school zones and about pedestrian barriers such as street vendors, electricity posts, and drainage. 2) The parents are concerned about the school environment. The highest level of parental anxiety about the school environment was about activity space such as playgrounds, swimming pools and toilet facilities respectively. This is consistent with the survey findings which found that toilets were often constructed at blind spots and in isolated areas. 3) The parental anxiety about interactions with teachers. Parental anxiety increased slightly when interacting with other parents and children. 4) When considering school management, it was found that the highest level of parental anxiety about child kidnap protection and about stranger protection respectively. 5) For school facilities, it was found that the parents needed parking lots. For safety, the parents also saw the need for surveillance cameras and lights. 6) This study investigated 2 aspects of personal factors including an understanding of child safety protection and the involvement in child safety in skill enhancement activities. 7) The anxiety about blind spots affected parental anxiety at the highest level. The parents concerned about the risk of access from strangers and risk areas in the school zone. The parental anxiety about blind spots was at 3.82. 8) For weather conditions, it was found that the parents are concerned more about rain than sunlight. When comparing to other factors, it was found that the parents are very concerned about the weather conditions because they concerned about their children's health especially among early-year and kindergarten children as presented in Figure 6.

Priority Parental Anxiety Index for School Zone Improvement

According to the analysis of decreased parental anxiety when the school environment is improved, 62 guidelines (Table 2.) in 26 sub-variables of 8 factors are proposed to create the Priority Parental Anxiety Index (PPAI). It was found that the average parental anxiety after the improvement was at 2.04 (PPAI = -0.427). The guidelines of each aspect are considered. This paper discusses only the most important aspects related to the current parental anxiety.

The guidelines for the environment around school zones such as roads, walkways, entrance and drop-off and pick-up area that may cause danger, the parents thought that crosswalks, crossing bridges, traffic symbols and signs should be improved to meet the standards so as to prevent road accidents around the school zone. Pedestrian barriers should be removed. Holes, ponds and broken drainage covers on walkways should be repaired. Drop-off and pick-up areas should be clearly marked especially walkways in front of the school during rush hours in the morning as presented in Figure 7.

Regarding the guidelines for improving the environment inside the school including buildings, walkways inside schools, service areas and activity space, the parents thought that doors, windows, and electrical outlets should be easy to use and not be dangerous to children. Balcony rails should be upright to prevent children from climbing. Toilet doors and sanitary ware should be easy to use and suit the children's age. There should be fences around the swimming pools. Covers on water buckets and ponds should be closely fitted and tightened to prevent children from accessing them, as presented in Figure 7.

When considering interactions, it was found that communication channels such as public telephones should be increased at schools to decrease parental anxiety. This can slightly decrease parental anxiety when compared to the use of personal equipment as the parents thought that most students have their own personal phones. An increase of public communication will be necessary in case of an emergency. For the interactions between parents and teachers, it was found that organizing interaction activities was better than communicating through Social Media. This is similar to the interaction between parents and children while presented in Figure 7.

For traffic problems inside schools and parking lots, there were limited spaces, resulting in the parental anxiety. The parents thought that prohibiting unnecessary vehicles from access to the school was an appropriate guideline to solve the problem. For child loss prevention, GPS devices such as watches or phones should be used. However, it is difficult to get the parents to accept GPS. Using identification cards, passwords or symbols to group and manage students was as economic way to manage the student population of the school. For safety policies, the parents thought that safety and monitoring policies should be formulated. Drop-off and pick-up areas should be clearly located. Students should be gathered together so that it is easy for teachers to monitor them as presented in Figure 7.

Figure 7 Priority Parental Anxiety Index (PPAI)

For school facilities including parking lots, symbols safety facilities and service areas, the parents thought that connecting walkways between parking lots outside school and drop-off and pick-up areas should be constructed. This would help to reduce road crossing by students more than improving parking lots. In addition, the parents thought that safety equipment such as a public phone booth and a warning

alarm should be provided more than establishing surveillance cameras at drop-off and pick-up areas. This shows that the parents did not consider surveillance cameras as an important factor among other improvements. Similarly, the parents thought that rest areas, meeting areas, and service areas should be provided as presented in Figure 7.

For personal factors affecting a decrease of parental anxiety, providing training for parents and school bus drivers could decrease the parental anxiety about travelling to school. Organizing training for teachers and guardians showed that the parents believed in teachers taking care of their children. When considering students, the parents thought that creating volunteer groups to assist drop-off and pick-up students decreased the parental anxiety more than providing traffic knowledge and self-reliance to students. This shows that the parents did not consider self-reliance among children as an important factor as presented in Figure 7.

For risk areas, the parents thought that establishing a safety monitoring unit for emergency situations was a guideline that could decrease parental anxiety. The index of this aspect was higher than managing proper routes during drop-off and pick-up times. Therefore, it was obviously seen that the parents needed assistance if an accident occurs rather than transport planning. In addition, only one entrance should be used during drop-off and pick-up times to reduce risk areas accessed by strangers. For surveillance and lighting improvements, surveillance cameras should be installed at blind spots and high-risk areas. Slippery surfaces and shock-proof areas should be improved to reduce the risk of injury as presented in Figure 7.

For the weather conditions, parents thought that roofs to protect from rain should be connected to parking lots, walkways and school buildings. For sunlight, the parents thought that the landscape should be improved. They thought that trees should be planted to give more shade on walkways and rest areas rather than building roofs over activity spaces. This shows that the parents want their children to play outdoors and can walk from parking lots to school buildings without getting wet. This is opposite to the current conditions. Schools often build large roofs over playgrounds and activity spaces but there are no roofs connecting from parking lots to school buildings as presented in Figure 7.

Conclusion and Suggestions

The findings showed that parental anxiety is at a medium to a high level. Family characteristics of the population, income, and educational background were high because Anuban Schools are high standard schools at provincial level. The highest level of parental anxiety was about road accidents at high risk areas (Sattanon, K, Upala, P, 2017), the environment around the school zone (Ghasrodashti R.E., Ardeshiri M., 2015) and safety management respectively. On the other hand, the lowest parental anxiety was about the interaction between parents, teachers and students and communication among them. This demonstrates good social characteristics. The PPAI was at -0.427. This means that the guidelines for the school environment improvement are at a good level or at a slightly high level. The connecting walkways to parking lots to reduce road crossing was a guideline that should be improved, a safety monitoring unit for emergency situations in at risk areas should be established. Lighting and surveillance cameras should be installed at blind spots around schools. Roofs to protect from rain should connect parking lots, the school gate and the school buildings. The findings of PPAI in overall reflected parental behaviour that considers child assistance, safety planning (Hosseini, L., & Khazali, H., 2013) and child safety skill enhancement as important factors (Conger, J. J., Kagan, J., & Mussen, P. H., 1969).

Recommendation for Future Research

It is obviously seen that the guidelines for school environment improvement stated in this study are under the parents' opinions who are important to child safety during drop-off and pick-up time. However, there are stakeholders such as teachers and school administrators whose opinions toward solving problems may be different. Therefore, opinions from stakeholders can be further studies in the future. Importantly, impacts from hot weather should be investigated in further studies. A technical manual for school environmental design and development should be implemented for achieving national and international standard which will be one of expected contributions from this research.

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