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Asia Pac J Public Health published online 19 March 2013
DOI: 10.1177/1010539513480229

The online version of this article can be found at:
http://aph.sagepub.com/content/early/2013/03/14/1010539513480229
“Feeling Unsafe”: A Photovoice Analysis of Factors Influencing Physical Activity Behavior Among Malaysian Adolescents

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Abstract
Understanding the factors influencing physical activity (PA) in the Asia-Pacific region is critical, given the high prevalence of inactivity in this area. The photovoice technique explores the types of PA and factors influencing PA among adolescents in Kuching, Sarawak. A total of 160 photographs were collected from participants (adolescents, n = 22, mean age = 14.27 ± 0.7 years, and parents, n = 8, mean age = 48 ± 6.8 years). Data analysis used constant comparison methods of a grounded theory. The Analysis Grid for Environments Linked to Obesity was used to categorize PA factors. Study findings were centered on the concept of safety, facilities, parental restriction, friends, cultural traits, media, community cohesiveness, and weather. The central theme was “feeling unsafe” when being outdoors. To promote PA behavior, provision of PA facilities needs to be supported by other programs that build on peer support, crime prevention, and traffic safety, together with other educational campaigns.

Keywords
adolescents, low-income neighborhood, physical activity, photovoice, grounded theory, Analysis Grid for Environments Linked to Obesity framework

Background
Inactivity is putting the least-active individuals at greatest risk for a variety of chronic diseases, functional impairment, and all-cause mortality.¹ Today, 31.1% of adults and 80.3% of adolescents worldwide are inactive.² Physical activity (PA) decreases significantly as children move into the adolescent years and continues to decrease as adolescents progress into young adulthood.³ Although physical inactivity is more prevalent in high-income countries, it has also increased greatly in low-income countries. Malaysia was ranked tenth in the world and highest among Southeast Asian nations, scoring 61.4% on the inactive index.² About 43.7% out of 5.5 million Malaysian adults are inactive.⁴ Also, more of the urban (16%) population has adequate exercise

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compared with their rural counterparts (12%). Among adolescents, about 45% of Malaysian boys and 88% of girls did not achieve step count recommendations. In addition, Malaysian adolescents spent an average of 4.69 hours on weekdays and 5.69 hours on weekends on screen-based media.

However, factors influencing PA behavior are known to be very complex. Research into PA correlates has burgeoned in the past 2 decades but has mostly focused on individual-level factors. It has shown that age, sex, health status, self-efficacy, and motivation are associated with PA, but at best, these correlates can only explain about 3.7% to 40.6%. This suggests that individual factors alone cannot fully explain the development of intervention strategies and should target changes beyond the individual level.

Increasingly, a social ecological theoretical framework has been used to guide investigations of PA. The social and physical environments have been identified as contributors to PA—namely, urban planning, transportation systems, parks, and trails. Research into ecological models has identified new potential mediators for use in intervention programs expected to lead to changes in PA behavior. However, an ecological model does not give specific guidance on which variables within each domain might be most important for the study topic and the target population at hand, thus requiring the integration of other models and theories to provide specificity for selected domains.

Although considerable research has been conducted on PA in Western countries, the population in the Asia-Pacific region differs in terms of physical, psychological, social, and cultural characteristics. In particular, little is known about the types of PA and factors influencing PA engagement among adolescents in Sarawak, East Malaysia. Sarawak was ranked the fifth highest in physical inactivity (48%) in Malaysia. The population of 2.51 million was made up of indigenous groups (52%), Chinese (24%), Malays (23%), and other races (1%).

Ideally, interventions should be dictated by local region and culture that warrant the current research. This exploratory study aims to explore the types of PA that adolescents engaged in and factors influencing their PA engagement, in 2 low-income neighborhoods in Kuching, Sarawak. This study also seeks to establish how the identified factors are interrelated in influencing adolescent PA.

**Methods**

This study applied the grounded theory (GT) and its process as shown in Figure 1. GT methodology is a qualitative inquiry approach that is used to build a theory through a systematic, inductive, and comparative process. In GT, data collection, coding, and analysis occurs immediately, concurrently, and throughout.

Entering the field included preparatory work such as selecting a site, obtaining access to the case, contacting participants, and gaining their consent. Ethical approval was granted by the University of Malaya Institutional Reviews Board (IRB Reference Number: 756.9).

Purposive sampling was used to recruit adolescents aged between 13 to 18 years from 2 residential areas in Kuching. The first few participants were identified via the researcher’s personal networks, and subsequently these participants invited other friends and/or neighbors to join the study. The focus group required approximately 6 to 8 adolescents per group, selected based on the ethnic ratio (indigenous = 50%, Chinese = 20%, Malays = 20%, others = 10%). Based on interim analysis results, requirements for additional data were identified, and information was solicited from parents.

The sample size was determined by theoretical saturation. The sample size of 22 adolescents met the parameter of the GT methodology, requiring between 20 and 30 participants. Additional data from 8 parents added to the richness of the data. The time length of this study was about 4 months (January to April 2010) for the core categories that emerged as a central theme.
Slices of data were obtained using the photovoice technique—the use of photographs and narrative stories to conceptualize life experiences and their environment. Photovoice follows a 3-stage process: (1) selecting—participants choose the photographs to be discussed; (2) contextualizing and storytelling—occurs during interview/group sessions; and (3) codifying the issues, themes, and theories that may generate many different meanings for a single image.

After an initial briefing, each participant was provided with a digital camera for them to take about 10 to 15 photographs of items, places, people, or events in the neighborhood that they perceived as factors affecting their engagement in PA. For the purpose of this study, PA was defined as any physical movement or mobility carried out for the purpose of leisure (eg, walk in the park, workout at the gym) or transportation (eg, walking/cycling to a destination) in the participant’s neighborhood.

Adolescents had 7 days to complete the photo-taking task. Subsequently, during focus group discussions hosted at community premises, participants explained the best 8 noteworthy photographs in relation to PA factors. Based on a previous photovoice study, the 8 photographs were found to be sufficient to discover salient factors in PA behavior.

Shortlisted photographs were projected on an LCD screen, and discussions were guided by a set of questions. Probes were used to stimulate the discussion. Each group discussion took about 90 to 180 minutes. The facilitator, assisted by a well-trained researcher, helped participants engage in analyzing and contextualizing the photographs. On completion of the adolescents’ focus group sessions, unstructured interviews with the parents were conducted. These were held at the residents’ own homes and lasted between 40 and 60 minutes.

Transcripts were loaded into NVivo 8.0. Analysis was carried out using constant comparison methods of a GT approach. In this, open, axial, and selective coding techniques were used. Axial coding refined the existing list of categories by deleting or combining some categories. Relationships between the categories and subcategories were analyzed using selective coding to begin developing a framework for conceptual linkages between categories. In addition, the

Figure 1. Grounded theory’s building process (Lehmann).
Analysis Grid for Environments Linked to Obesity (ANGELO) framework was used to categorize PA factors. This framework classified the environment into micro (e.g., physical, sociocultural, economic, or political) and macro (e.g., all levels of government) groupings. The main reason for the selection of this framework is because it prioritizes environmental interventions and research.

The writing of theoretical memos started almost parallel with open coding. Memos are the researcher’s record of analysis, thoughts, interpretation, questions, and directions for further data collection. The extant literature, read as a source of more data to be compared with existing grounded data, raised the theoretical level and improved construct definitions. At this stage, the researcher has “discovered” a substantive theory applicable to the particular area of empirical enquiry from which they emerged.

The present study applied a validation scheme by going back to the participants to confirm preliminary findings and by informing the process involved from departure to arrival of a theoretical framework. Additionally, peer debriefing discussions of the emergent themes were conducted among research team members to increase the credibility of the findings.

### Results

A total of 160 photographs was provided and discussed by the adolescents (n = 22) and parents (n = 8). Some participants (4 adolescents and 2 parents) were unable to provide photographs, whereas some took fewer photographs because of the rainy season in January. However, these participants were still included in the study. Information about the participants’ characteristics is presented in Table 1. The mean household income shows that they belong to the lower-middle-income and poor groups.

### Types of PA

The adolescents perceived PA mainly as sports activities or outdoor games that are beneficial for a healthy body and mind, to keep fit, to improve body image, to reduce stress, and to occupy one’s leisure time. The types of PA and sedentary leisure activities engaged in by both genders are shown in Table 2.

In general, adolescents listed involvement in fewer types of PA compared with their long list of sedentary activities, which mainly involve screen-based entertainment (e.g., television,
Facebook, computer games, etc). Football was the boys’ most preferred type of sports activity, whereas the girls preferred badminton; these are commonly played on neighborhood streets. 

*Lepak* was a popular leisure activity among adolescents. Among boys, *lepak* meant taking a breath of fresh air, chatting, and looking at girls. For girls, *lepak* meant chatting and gossiping. 

Another popular activity among adolescents across gender was motorcycling. Motorcycles are the main mode of transport among adolescents to get them to grocery stores, places of worship, and meetings with friends and also to attend cocurricular activities in school. 

Motorcycling was reported to be a fun leisure activity and a quicker mode of transport to reach one’s destination. It also afforded adolescents protection from stray dogs and snatch thieves. Furthermore, the boys felt motorcycling was “cool” because it attracted the opposite sex. Some parents even conveniently relied on their adolescents to ferry them to the market or to purchase items from grocery stores.

### Factors Influencing PA Engagement

The findings of this study are centered on the concepts of “safety,” “facades,” “parental restriction,” “friends,” “cultural traits,” “media,” “community cohesiveness,” and “weather.” The central theme is focused on “feeling unsafe” when being outdoors. The findings are illustrated with photovoice quotations in Table 3.

Based on the ANGELO framework, the themes (Table 3) have been categorized into (1) physical environment (eg, traffic hazard, animal threats, poor aesthetics, and availability of and accessibility to recreation facilities) and (2) sociocultural environment (eg, crime, parent-constrained behavior, friends, gender role, neighborhood cohesiveness, ethnic segregation of play space, and screen-based entertainment).

### Interrelationships Between Factors Influencing Adolescent PA

A supportive environment (ie, provision of recreational facilities and accessibility) encourages parents and peer support, thereby enhancing adolescents’ self-efficacy to be physically active.
**Table 3. Qualitative Themes From the Photovoice Data.**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociocultural environment</strong></td>
<td></td>
</tr>
<tr>
<td>Crime (Safety aspect)</td>
<td>This is near my house. My son was passing through this area alone. Suddenly, a motorcyclist stopped him and put a knife to his neck. Then, he grabbed my son’s mobile phone.</td>
</tr>
<tr>
<td></td>
<td>[Mother #4, 48 years old]</td>
</tr>
<tr>
<td><strong>Wary of stranger (Safety aspect)</strong></td>
<td>This play space is near my house, but we are scared to go here. We are afraid bad things may happen to us. We could be raped, kidnapped, murdered, snatched, or bullied. [Name], you remember the guy on a motorbike? He stopped at the end of this play space and flashed his private part at us. . . . An old man. . . . We were so scared! My mother doesn’t like me to go out. She gets worried. This housing area is not safe</td>
</tr>
<tr>
<td></td>
<td>[Focus Group 4, Girl]</td>
</tr>
<tr>
<td><strong>Drug pusher/Drug addicts (Safety aspect)</strong></td>
<td>Pills that make them high—ecstasy or, as some people call it—ice. We are worried about this. They have it in schools too. Outsiders sell it to them. So after school they meet at certain places. We don’t know.</td>
</tr>
<tr>
<td></td>
<td>[Mother #8, 45 years old]</td>
</tr>
<tr>
<td><strong>Bully (Safety aspect)</strong></td>
<td>Sometimes I don’t ask him to go out because the big kids like to bully him. One time, someone called out to him, “Hey you! Come out and fight!” It was raining, I went out. The boy saw me and ran away.</td>
</tr>
<tr>
<td></td>
<td>[Mother #7, 53 years old]</td>
</tr>
</tbody>
</table>
Table 3. (continued)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Quotations</th>
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</table>
| Screen time                                 | This is my computer. I love logging on to Facebook. I can see my friends and chat with them. I would spend 2 hours a day [on Facebook]. After that I play online games, “Counterstrike.” My parents used to yell at me.  
[Focus Group #3, Boy, Urban]                                                                 |
| Parental restrictions (Parental autonomy)   | Parents restrict us from playing outside because of exams, tuition, [the fear of] being kidnapped or bad weather.  
[Focus Group #3, Boys and Focus Group #4, Girl]                                                                 |
| Need friends to be active with (Social interaction) | These are my friends, teaching me how to ride a bicycle. But most of the time we just lepak [hang out] and gossip. When we talk, our hands are still busy “SMSing” [texting] other friends.  
[Focus Group #4, Girl]                                                                 |
|                                             | We are not allowed to swim or go fishing here. If you go swimming, the ghost will pull your legs.  
[Focus Group #1, Girl]                                                                 |
|                                             | He doesn’t go out anymore because he doesn’t have friends his age. He feels shy  
[Grandmother #1, 61 years old]                                                                 |

*No photo provided

(continued)
<table>
<thead>
<tr>
<th>Themes</th>
<th>Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community cohesiveness</td>
<td>RELA only patrols the area at night. In this housing area, most parents are working. We don’t see each other. We don’t talk to our neighbours.</td>
</tr>
<tr>
<td></td>
<td>If we have a wedding or someone passes away, the girls help by washing plates, cutting onions.</td>
</tr>
<tr>
<td>Ethnic segregation of play space (Cultural traits)</td>
<td>Many races live here. Iban, Bidayuh, Chinese, Orang Ulu. We can mix. But the Malays find it difficult to mix with the non-Malays. So they play on the other side. Because you know kids, when they eat, they don’t know what is halal or nonhalal.</td>
</tr>
<tr>
<td>Women’s role (Cultural traits)</td>
<td>I have to do house chores. Cooking and cleaning. I am the only girl in the family. My parents are working and all my siblings are boys.</td>
</tr>
<tr>
<td></td>
<td>The girl must learn to do house chores. They are growing to be adults.</td>
</tr>
<tr>
<td>Norms and beliefs (Cultural traits)</td>
<td>We should not mix freely with the boys. We are worried bad things may happen. Girls need to take care of themselves.</td>
</tr>
<tr>
<td></td>
<td>Jogging!! The people here are not used to jogging. The Chinese, they like to jog. In this village, if you jog, people will say you are crazy!</td>
</tr>
<tr>
<td>Physical environment</td>
<td></td>
</tr>
<tr>
<td>Lack of physical activity facilities (Facilities)</td>
<td>We only have 1 football field on that side but we don’t have any proper place for those who want to exercise . . . cycling, playing badminton. The kids always use the road.</td>
</tr>
<tr>
<td></td>
<td>My kids. . . They play football on the road. Here, our road is not so busy, but it is still dangerous. We have a football field at Sinjok but it is quite far from here.</td>
</tr>
<tr>
<td>Poor aesthetic construction (trash, debris, stray dogs) (Safety aspect)</td>
<td>Trash on the ground . . . difficult to walk around. Awfully smelly and is an eyesore. The rubbish collector doesn’t collect rubbish on the ground.</td>
</tr>
</tbody>
</table>
### Table 3. (continued)

<table>
<thead>
<tr>
<th>Themes</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It’s difficult to ride my bicycle. My parents planted fruit trees around the house.</td>
</tr>
<tr>
<td></td>
<td>[Focus Group #1, Girl]</td>
</tr>
<tr>
<td></td>
<td><img src="image1.jpg" alt="Image of fruit trees" /></td>
</tr>
<tr>
<td>Road safety (Safety aspect)</td>
<td>A car almost knocked my nephew from the next house. He wanted to turn but didn’t see the car coming towards him so fast. The road in front of our house has no speed hump.</td>
</tr>
<tr>
<td></td>
<td>[Mother #6, 46 years old]</td>
</tr>
<tr>
<td></td>
<td><img src="image2.jpg" alt="Image of road" /></td>
</tr>
<tr>
<td></td>
<td>The road is narrow and a lot of big vehicles use the road back and forth. Dangerous for the kids. My dog died after being knocked down by a lorry.</td>
</tr>
<tr>
<td></td>
<td>[Focus Group #2, Boy]</td>
</tr>
<tr>
<td></td>
<td><img src="image3.jpg" alt="Image of narrow road" /></td>
</tr>
<tr>
<td>Personal safety (Safety aspect)</td>
<td>We have open spaces to play football. But they are dangerous; there are a lot of broken bottles here. People drink <em>langkau</em> (local liquor) and then break the bottles. Maybe they were drunk.</td>
</tr>
<tr>
<td></td>
<td>[Focus Group #3, Boy]</td>
</tr>
<tr>
<td></td>
<td><img src="image4.jpg" alt="Image of broken bottles" /></td>
</tr>
</tbody>
</table>
### Theme: Dangerous to swim. People throw rubbish and sharp objects in the river. [Focus Group #2, Boy]

This stray dog has bitten my leg. It made me want to poison a bun and feed it to the dog. I used to walk on foot to the market. I didn’t realize the dog coming from the back and it bit me. My jeans were torn and my leg was bleeding. Nowadays I don’t walk anymore. I use a car to go to the supermarket.  
[Mother #5, 47 years old]

- **Animals threats (Safety aspect)**

- **Weather (Safety aspect)**

  This is during a hot day. There is strong sunlight. Parents don’t like us to go out if it is too hot. We may get sick.  
  (From every adolescent and parent)

---

*Major themes are indicated in parentheses and italics.*
Conversely, a risky environment (ie, neighborhood crime, traffic hazards, and poor aesthetics) aggravate the sense of one “feeling unsafe,” which triggers parental restrictions and perceived barriers, thereby affecting self-efficacy, and induces more media use among adolescents. These physical and social-cultural factors are believed to be interrelated and to have direct and indirect effects on PA behavior. The linkages between these factors are depicted in Figure 2.

Discussion

This article presents qualitative themes related to types of PA and factors influencing PA among adolescents as identified through the photovoice technique with the participation of 22 adolescents and 8 parents from 2 low-income neighborhoods in Kuching, Sarawak, Malaysia.

The types of PA that adolescents were involved in were useful to enhance adolescent PA in the neighborhood setting. Ball games (ie, football) were identified as suiting adolescent boys, whereas the girls were more keen about indoor PA (ie, gymnasium and badminton).

The themes that influenced PA included the following: safety, facilities, parental restriction, friends, cultural traits, media, community cohesiveness, and weather. Safety was a major concern affecting adolescent PA. About 13% of the participants in this study were victims of snatch thieves, and others kept hearing about crime from family, friends, or the media. This has led to a greater fear of crime, which may negatively affect well-being. Other safety concerns include getting into road accidents, being influenced by drug addicts, getting bitten by animals, being bullied, or being teased by others.

As adolescents, particularly girls, are prime targets, most parents—especially mothers—tend to constrain their children’s routine habits by permitting them to indulge in media entertainment and providing them with mobile phones. This is apart from limiting the time, place, and frequency of outdoor activities. In addition, parents also use strategies such as spinning ghost stories to make them timid and docile, thus discouraging them from venturing far or engaging in dangerous outdoor activities. Adolescents being at home felt the safest for parents.

Figure 2. The pathways between the psychosocial variables, environmental variables, screen time, and physical activity.
In the long term, parents’ protective behavior may hamper adolescents’ confidence to engage in any outdoor activities. This is because in order for adolescents to be physically active, they consistently need mastery skills, social models, social persuasion, and a positive mood.\textsuperscript{23}

In such circumstances, the point of intervention should be crime prevention. The Crime Prevention Through Environmental Design is one of the approaches that promote territoriality, improve visibility to increase surveillance, remove visible signs of neglect (litter, graffiti, etc), and limit points of entry to control access.\textsuperscript{22} Residents in cul-de-sacs are found to have greater social contact, engage more in surveillance, and display higher territorial features; all these have been associated with less crime and fear of crime.\textsuperscript{22}

In this study, we found that streets were commonly used as a play space in the neighborhood. Hence the issue of traffic safety was raised by all parents. Poor road designs (ie, no speed humps, sidewalks) have a tendency to affect outdoor activities, directly or indirectly, through parental restrictions and perceived barriers. A previous study found that regulation of traffic speed and paths separated from the road were significant factors in enhancing female PA.\textsuperscript{24}

Additionally, the use of streets as a play space indicates the lack of PA facilities in the neighborhood. Most play spaces have been used for housing and agriculture. Even when recreational facilities such as football fields are actually available, it has been reported that these are covered by thorny creepers (\textit{Mimosa pudica}) and sharp objects (broken bottles, construction debris, etc), making them unsafe for use.

Adolescents have also emphasized the need to “have a friend” in order to be active. The presence of friends may influence PA behavior because it helps lessen their fear of being a victim of a crime, bullying, and peer teasing.\textsuperscript{25} In this study, adolescents were reported to have fewer neighbors as friends to be active with. As such, being indoors is a “safer” option than participating in outdoor activities.\textsuperscript{26} Consequently, they engaged more in online social networks such as Facebook to relieve boredom, share jokes, and exchange gossip. In the adolescent context, a friend must be someone of the same age, gender, ethnicity, and religion and from the same school.\textsuperscript{27}

Moreover, traditional societal norms to avoid any untoward relationships mean that boys and girls do not mingle around freely. Adolescent girls are expected to fulfill a women’s role—that is, to be responsible for household chores and tasks.\textsuperscript{28} This could hinder girls from being equally active as boys. Adolescents are also bound to comply with and obey their parents’ rules. They are dutifully encouraged to study hard and excel academically, so as not to inherit the poverty of their parents.

In a multiethnic neighborhood, cultural differences and negative stereotypes about each other restrict social interaction,\textsuperscript{29} which include the use of play spaces for PA. This study found that a dominant ethnic group tends to dominate a play space, thereby creating a sense of uneasiness for other ethnic groups.

As a whole, because of safety issues, adolescents in this study—girls especially—are leading a more sedentary lifestyle. This is not surprising because (1) safety issues surpass PA benefits; (2) the types of PA engaged in by adolescents require proper facilities, but low-income neighborhoods do not have such facilities or are unsafe; (3) road designs are poor; (4) parental restriction on outdoor activities are common; (5) youngsters are encouraged to study hard and excel academically; and (6) there is a lack of friends to be active with together, with limited intergender friendships.

The interrelationships in the process of PA engagement were challenging and difficult to disentangle. Pathways are often highly indirect and may be mediated by environmental factors.\textsuperscript{22} The present study divided the environmental factors found into 2 characteristics: supportive environment and risky environment. A supportive environment promotes parental support, self-efficacy, and increased PA, whereas a risky environment promotes constraining behavior on the part of parents, perceived barriers, media entertainment, and reduced PA.
Study Strengths and Limitations

Interpretation of this study’s findings should be contemplated in the light of several limitations. The types of samples and the nature of data collection limit the inferences that can be made from the findings. The indigenous participants were restricted to the Bidayuh tribe, the largest tribe in Kuching, which may not be representative of other communities in Sarawak. Participants were also predominantly from the low-income group.

In addition, the snowball sampling method could lead to “premature” theoretical saturation. Because adolescents are required to photograph items, places, people, and/or events in the neighborhood, they could have done this assignment in a group, taking similar pictures and providing similar themes. In GT, when no new themes emerged, theoretical saturation was assumed.

On a positive note, the use of the photovoice technique is valuable in engaging multiethnic adolescents who would not have been as comfortable articulating their views freely through other media such as questionnaires. In this instance, participants were able to make valuable, competent, informed, and meaningful contributions toward the research agendas that affected their lives directly.

Conclusion

This study is exploratory, in that it outlines the types of PA and factors influencing adolescent PA behavior, useful in planning and developing support to enhance PA. The factors were centered on “safety,” and the sources of insecurity include neighborhood crime, unsafe facilities, getting into road accidents, encountering drug addicts, being bitten by animals, being bullied and/or teased, and intergender friendships. When individuals perceive their social and physical environment as unsafe, they are unlikely be physically active in their neighborhood and consequently venture further into screen-based media entertainment. Therefore, to promote PA behavior, provision of PA facilities needs to be supported by other specific programs that build on peer support, crime prevention, and traffic safety, together with other educational campaigns.

Acknowledgement

The authors gratefully acknowledge parents, adolescents, and key informants who participated in this study.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research received a Postgraduate Research Grant from University of Malaya (Grant Ref. No: PS200/2009C).

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