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COMBATING SECOND HAND SMOKING WITH COMMUNITY PARTICIPATING 'SMOKE FREE ZONES': SRI LANKA EXPERIENCES

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Abstract

Although the overall smoking prevalence has shown a downward trend, second hand smoke (SHS) exposure remains a significant problem in Sri Lanka. Various attempts have been made to establish 'Smoke Free Zones' (SFZs) for combating SHS with the help of Public Health Inspectors (PHIs) who are regarded as the main coordinators of combating SHS at the grass root level. This study explored the lessons learnt from establishing SFZs in Sri Lanka and both qualitative and quantitative approaches were employed. There were 53 SFZs from 20 Districts that were studied, and the study consisted with three components. Chi – square test was performed to study the relationships between variables and qualitative data was analyzed through the framework analyzing method. All studied SFZs focused on reducing the availability of tobacco products by mobilizing retailers parallel to creating awareness among the stakeholders. The mean time taken to reach the maximum success is 9 (± 8) months and mean sustained period is 16 (± 12) months. Forty nine factors for establishing SFZs were identified and six factors have had statistically significant relationship with sustainability. Furthermore, ten constructive groups and twelve destructive groups as well as fifteen reasons for deteriorating the successes were encountered. Ten steps process for establishing SFZs in Sri Lanka was also Introduced. The study recommends employing the introduced 10 steps process to establishing SFZs in Sri Lanka and develops the strengths and opportunities while minimizing the weaknesses and threats to create a supportive environment prior to establishing SFZs and pay continuous attention on the reasons for deteriorating success to improve the sustainability.

Keywords

Drug Abuse, Narcotic, Third Hand Smoke, Tobacco Free City, Violence

1. Introduction

Exposure to secondhand tobacco smoke (SHS) is a serious threat to the health of General Public, causing death and disease in non-smoking adults and children (USDHHS, 2006). It is a mixture of two forms of smoke produced from burning tobacco products such as cigarettes, cigars, or pipes, and smoke that has been exhaled, or breathed out, by the person smoking (CDCP, 2017). SHS can persist indoors at potentially harmful levels for long periods following even one cigarette (Semple & Latif, 2014).

There is no safe level of exposure identified to SHS. In adults, SHS causes serious cardiovascular and respiratory diseases such as coronary heart disease, lung cancer, and stroke (CDCP, 2017; WHO, 2017a). In addition, it causes low birth weight in pregnant women and sudden death in infants. At least half of children regularly breathe the air polluted from tobacco smoke in public settings (WHO, 2017a). Ear infections, more frequent and severe asthma attacks, respiratory symptoms (coughing, sneezing, and shortness of breath) and respiratory infections (bronchitis and pneumonia) are some of the health issues caused by SHS to children (CDCP, 2017). SHS causes about 890 000 premature deaths per annum. Children accounted for 28% of the deaths attributable to SHS in 2004 (WHO, 2017a). Therefore, eliminating smoking at all homes, worksites, and public places is essential in order to fully protect non-smokers from SHS (WHO, 2017a). There are different strategies employed in combating tobacco-related health issues all over the world. The World Health Organization Framework Convention for Tobacco Control (WHO-FCTC) promotes Smoke free cities as an effective tobacco control strategy (WHO, 2017b).

The Democratic Socialist Republic of Sri Lanka is an island Nation in the Indian Ocean, which locates off the south-eastern tip of the Indian Subcontinent. It is a lower middle-income country with a total population of 21 million people and a per capita income of USD 3,924 in 2015. Following a 25 year long civil war that ended in 2009, Sri Lanka's economy grew at an average of 6.4% between 2010-2015, reflecting a peace dividend and a determined policy thrust towards reconstruction and growth. Sri Lanka's economy has transitioned from a predominantly rural, agricultural economy towards a more urbanized economy driven by services. In 2015, the service sector accounted for 62.4% of Gross Domestic Product (GDP), followed by manufacturing (28.9%), and agriculture (8.7%). The country ranked 73rd in Human Development Index in 2015 and has comfortably surpassed most of the MDG targets set for 2015 (World Bank, 2017).

Sri Lanka was the 5th country in the South-east Asian Region to sign the Framework Convention for Tobacco Control and the first country in the region to ratify it. According to the guidance of WHO-FCTC, National Authority on Tobacco and Alcohol Act, No. 27 of 2006 was enacted in Sri Lanka supporting preventive measures regarding alcohol and tobacco use (WHO, 2017c; Campaign for Tobacco free kids, 2017). However, 45.7% of men, 5.3% of women, and 25.8% overall are current users of tobacco in any form of Sri Lanka (WHO, 2016).

In Sri Lanka, while the overall smoking prevalence has shown a downward trend, SHS exposure at home remains a significant problem, despite the recent laws enacted to prohibiting

smoking in public places. Women and children are highly vulnerable; it is they who inevitably breathe in SHS due to the high prevalence of male household members who use tobacco. The National Authority on Tobacco and Alcohol of Sri Lanka has taken the initiative in carrying out National program for establishing 'Smoke Free Zones' for combating SHS with the help of Public Health Inspectors (PHIs) who are the main coordinators at the grass root level in 2016 (NATA, 2016). However, even before such various attempts were made to establish Smoke Free Zones (SFZs) in the country (Piyasumana et al., 2015). The study attempted to explore the lessons learnt from these SFZs in Sri Lanka.

2. Materials and Methods

This study was based on both Quantitative and qualitative approaches. Data gleaned from fifty three (53) SFZs belongs to 20 out of 25 administrative Districts were used for the study and they were divided into three strata as follows:

1. SFZs no longer function
2. SFZs continuously function
3. Other SFZs

The first stratum includes the SFZs functioned within a certain period of time and then deteriorated due to various reasons and they were no longer in function (n=15). The second stratum includes the SFZs which have been continuously functioning over 20 months: the period of mean sustained period of 1st stratum + Standard deviation (n=9). Rest of SFZs belonged to the third stratum (n=29). Then the SFZs belonged to first and second strata (n=24) were selected for quantitative analysis and they were located in 17 Districts. However, all 53 SFZs were taken into consideration for qualitative analysis.

The study consisted with three components; self-administered questionnaire survey (n=53), 37 group discussions and 21 in-depth interviews. Pre-tested self-administered questionnaire was given to Public Health Inspectors (PHIs) who were the coordinators of grass root level in selected 53SFZs. Thirty seven group discussions were held and 21 in-depth interviews were conducted with stakeholders to gather data. Pearson's Chi – square test was performed to study the relationships between variables and qualitative data was analyzed through the framework analyzing method.

3. Results

All 53 studied SFZs focused on reducing the availability of tobacco products by mobilizing retailers parallel to creating awareness among the stakeholders. The mean time taken to reach the maximum success of the 1st stratum SFZs is 9 (\pm 7) months and mean sustained period is 11 (\pm 9) months. The mean time taken to reach the maximum success of 1st and 2nd strata together is 9 (\pm 8) months and mean sustained period is 16 (\pm 12) months. The results of Chi – square tests are shown in Table 1.

Table 1: Chi – Square Test Statistics

Tested variables	χ^2 -value	p-value	Significance (at p<0.05)
Time taken to reach the maximum success Vs. Sustained period (excluding 2 nd stratum)	7.8241	0.0051	Significant
Enthusiasm of PHI where SFZ located at the beginning Vs. Sustained period	4.6082	0.038	Significant
Enthusiasm of PHI where SFZ located during project tenure Vs. Sustained period (excluding 2 nd stratum)	6.5160	0.0107	Significant
Enthusiasm of Supervising officer of PHI where SFZ located at the beginning Vs. Sustained period	8.0607	0.0045	Significant
Enthusiasm of Supervising officer of PHI where SFZ located during project tenure Vs. Sustained period	4.0328	0.0446	Significant
Enthusiasm of colleagues of PHI where SFZ located at the beginning Vs. Sustained period	0.5106	0.4749	Not significant
Enthusiasm of colleagues of PHI where SFZ located during project tenure Vs. Sustained period	4.1119	0.0426	Significant
Working experience Vs. Time taken to reach the maximum success	1.3986	0.2369	Not significant
Working experience Vs. Sustained period	0.0112	0.9157	Not significant
Method used Vs. Sustained period	0.1110	0.9459	Not significant

Eight strengths, nine weaknesses, sixteen opportunities, and sixteen threats affecting establishment of SFZs were explored within the form of SWOT analysis (frequency/percentage given within brackets). Recognition for the PHIs (48/91%), skills and expertise of PHIs (39/74%), assistance of grass-root level public health staff (28/53%), national level organizations (10/19%), certain facilities (9/17%), authority as an authorized officer in certain Acts (7/13%), encouragement from the National Authority on Tobacco and Alcohol (4/8%), and current legal provisions relating to tobacco (3/6%) have been identified as strengths.

Identified weaknesses were busy time schedule of PHIs due to the heavy-duty list (12/23%), poor enthusiasm of grass root level public health staff (7/13%), poor enthusiasm of informal community leaders (4/8%), low enthusiasm of middle and top management (3/6%), limitations of the National Authority on Tobacco and Alcohol Act, No. 27 of 2006 (2/4%), delay or no follow ups (2/4%), lack of certain facilities (2/4%), lack of knowledge and training on tobacco prevention and cessation (1/2%), and lack of financial facilities (1/2%).

Trades' Unions (49/92%), active participation of community based organizations (43/81%), assistance of other governmental field officers (34/64%), active participation of religious leaders (30/57%), active participation of school community (30/57%), active participation of community leaders (28/53%), easy access to implementing programs (24/45%), community urge for living in a drug-free environment (23/43%), assistance of other governmental administrative officers (22/42%), awareness among community on harmful effects of tobacco use (19/36%), school health clubs (15/28%), non-smoking traders (13/25%), assistance of Non-governmental organizations work on tobacco prevention and cessation (12/23%), ability to influence traders through their children (7/13%), association between PHIs and teaching staff of schools in School Medical Inspections (6/11%), and female retailers (2/4%) were identified as opportunities.

Identified threats included the tobacco company interference (29/55%), addicted persons to tobacco smoking (17/32%), starting tobacco selling at alternative places (14/26%), traders who did not stop selling tobacco products (12/23%), availability of tobacco products (10/19%), promotional strategies of company (8/15%), legal and illegal alcohol and narcotic drug smugglers (8/15%), influence of peer groups (6/11%), temporary tea and coffee shops (5/9%), traders' negative attitude (3/6%), poor level of education (3/6%), some local politicians (2/4%), misled people (2/4%), tobacco cultivation (2/4%), certain youth groups (2/4%), and whole sellers of tobacco products (2/4%).

Furthermore, ten constructive groups and twelve destructive groups who can influence SFZs were identified. Community based organizations (43/81%), traders' unions (41/77%), government field officers (34/64%), school community (33/62%), religious leaders (30/57%), informal community leaders (28/53%), staff of Medical Officer of Health's office (28/53%), administrative officer in government institutions (22/42%), Non-governmental organizations work on tobacco prevention and cessation (12/23%), and female traders (2/4%) were the identified constructive groups. In contrary, tobacco company (29/55%), addicted persons (17/32%), traders who did not stop selling tobacco (12/23%), legal and illegal alcohol and narcotic drug smugglers (6/11%), thugs and underworld figures (4/8%), outsiders (4/8%), tea and coffee shops and hotels (4/8%), lottery ticket sellers (3/6%), fish sellers (2/4%), certain youth groups (2/4%), whole sellers of tobacco products (2/4%), and certain politicians (2/4%) were the identified destructive groups.

The study found out fifteen reasons for deteriorating the successes; tobacco company interference (29/55%), delay or no follow ups (14/26%), starting tobacco selling at alternative places (14/26%), influence of traders those who did not stop selling tobacco (12/23%), influence of legal and illegal liquor sellers (6/11%), the traders mind could be changed with the time to restart selling tobacco products (5/9%), addicted persons threaten the traders (4/8%), discourage of PHIs due to irregularities of middle and top management (2/4%), addicted persons go for alternatives or alternative ways for buy tobacco products (2/4%), threaten the stakeholders to give up the program (2/4%), transfer of active PHIs (2/4%), political influence (2/4%), tobacco cultivation (2/4%), poor encouragement of PHIs (1/2%), and poor encouragement of stakeholders (1/2%).

Finally, the most frequented steps followed by the stakeholders in the process of establishing SFZs were listed to introduce the most suitable process that could be used in the future in this regard (Table 2).

Table 2: *Most Frequented Steps Followed by the Stakeholders in the Process of Establishing SFZs*

No	Step	Frequency	Percentage*
1	Discuss with supervising officers and colleagues	10	19
2	Identify the boundaries of the Smoke Free Zone	28	53
3	Conducting a survey and data analysis	30	57
4	Discuss with traders' unions and other stakeholders	50	94

5	Create steering committee and set targets	3	6
6	Create awareness among community	45	85
7	Set up a timeline and allow traders to finish available stocks of tobacco products	5	9
8	Take legal action against those who violate the National Authority on Tobacco and Alcohol Act, No. 27 of 2006	7	13
9	Appreciate stakeholders	25	47
10	Continuous awareness of the stakeholders	9	17
11	Continuous follow ups to early detection of problems and take remedial actions	18	34

* This percentage was given as a ratio of total studied SFZs (n=53)

4. Discussion

The study found a statistically significant relationship between the time taken to reach the maximum success and the sustained period. Enthusiasm of PHI and the supervising officer of PHI where SFZ located at the beginning and during project tenure, and enthusiasm of colleagues of PHI where SFZ located during project tenure have statistically significant relationships with Sustained period.

However, the relationship between the enthusiasm of colleagues of PHI where SFZ was located at the beginning and the sustained period is not statistically significant. It was also found that there is no statistically significant relationship between working experience with the time taken to reach the maximum success or the sustained period. The methods used by the PHI to establish SFZ were divided into three broad categories for the easiness of study: (A) Doing a baseline survey and continuation of the process (B) Doing a baseline survey, plan the process, and continue the project accordingly and (C) Starting and continuing the process without planning, adapting to the rising challenges. There is no statistically significant relationship between the method used and the sustained period.

Eighty three percent (83%) of SFZs spent more than 12 months to reach the maximum success succeeded more than 11 months, and only 11% of SFZs spent more than 12 months to reach the maximum success succeeded less than 11 months. Only seventeen percent (17%) of SFZs spent less than 12 months to reach the maximum success succeeded more than 11 months, and 89% of

SFZs spent less than 12 months to reach the maximum success collapsed within first 11 months. The Sustained period also depended on the enthusiasm of PHI where SFZs located at the beginning and during the project tenure. Sixty four percent (64%) of SFZs where PHI has shown high enthusiasm at the beginning sustained more than 20 months and only 36% of SFZs where PHI has shown high enthusiasm at the beginning sustained less than 20 months. Eighty percent (80%) of SFZs where PHIs showed less enthusiasm collapsed within first 20 months and only 20% remained over 20 months. Ninety one percent (91%) of SFZs where PHI has shown high enthusiasm during the project tenure sustained more than six months and only 9% of SFZs where PHI has shown high enthusiasm during the project tenure sustained less than six months. Seventy five percent (75%) of SFZs where PHIs showed less enthusiasm collapsed within first 10 months and only 25% remained over 10 months.

Enthusiasm of supervising officer of PHI where SFZs located at the beginning and during the project tenure also has a significant impact on sustained period. In eighty percent (80%) of SFZs where the supervising officer of PHI has shown high enthusiasm at the beginning sustained more than 20 months, and only 20% collapsed within first 20 months. Seventy nine percent (79%) of SFZs where the supervising officer of PHI has shown less enthusiasm at the beginning collapsed within first 20 months and only 21% succeeded over 20 months.

Seventy percent (70%) of SFZs where the supervising officer of PHI where SFZ located showed high enthusiasm during the project tenure, sustained more than 20 months and only 30% of SFZs where supervising officer of PHI has shown high enthusiasm during the project tenure sustained less than 20 months. Seventy one percent (71%) of SFZs where the supervising officer of PHI has shown less enthusiasm during the project tenure collapsed within first 20 months and only 29% remained over 20 months.

Moreover, enthusiasm of colleagues of PHI where SFZs located during the project tenure has shown a significant effect on the sustained period. Seventy five percent (75%) of SFZs where the colleagues of PHI who works at SFZs has shown a high enthusiasm during the project tenure has sustained more than 20 months and only 25% of SFZs collapsed within the first 20 months. Sixty nine percent (69%) of SFZs where colleagues of PHI where SFZs located has shown less enthusiasm during the project tenure has sustained less than 20 months and only 31% of such SFZs have sustained more than 20 months.

The SWOT analysis could be utilized for understanding stakeholders' strengths and weaknesses, and for identifying both the opportunities open to them and the possible threats faced in the process of establishing SFZs. Recognition for the PHIs among the public and their skills and expertise as well as assistance of grass-root level public health staff have been identified as leading strengths. National level organizations such as the National Authority on Tobacco and Alcohol and the Presidential Task Force on Drug Prevention could be used for this project as strength. Certain facilities available to the PHIs such as human resources, technical support, transport, audio-visual aids, and printed materials were also identified as strengths. PHIs have the authority as an authorized officer of the National Authority on Tobacco and Alcohol Act No. 27 of 2006 and the Food Act No. 26 of 1980. These legislative enforcements could be utilized to take legal action against those who violate the National Authority on Tobacco and Alcohol Act. Moreover, Food act gives legal provisions to deal with food handling establishments where tobacco products are usually sold.

Active participation of traders unions and other community based organizations were identified as primary opportunities. Community Based Organizations such as Rural Development Societies, Funeral-Cost Donation Societies, Women's societies, Youth clubs, Elderly clubs, Mother supportive teams, Three-wheel drivers' societies have been identified in this regard. Furthermore, easy access to implementing programs at schools, health clinics, and work places are stated as opportunities.

Busy time-schedule of PHIs due to the heavy-duty list has been identified as the main weakness, and poor enthusiasm of grass root level public health staff fuel the problem. Tobacco Company interference has been identified as the major threat in these projects. Going to court against PHIs and other stakeholders, attempting to bribe the stakeholders, physical harassments through thugs and underworld figures, threatening by anonymous phone calls, spreading false information, encouraging shop owners to sale tobacco products through various methods (organizing entertainment events, giving certificates and awards, increasing discounts, financial aids, renovation of shops, rendering legal aid, and retaining lawyers for court appearances) are identified as tobacco company interferences. In tobacco cultivating areas, company induces tobacco barn owners and farmers to protest against these projects. Selling tobacco products in alternative places is another key issue. When food handling establishments stop selling tobacco products the demand for them increases, and as a result, individuals may try to sell tobacco products at alternative places. In some cases company or whole sellers led mobile sellers come into play. Furthermore, attempted to sell

tobacco products via lottery ticket sellers, fish sellers, and three wheel drivers in addition to selling tobacco products at houses and hardware shops were identified. The factors explored by previous studies (Pallewaththa et al., 2017) are in line with the findings of present study. Besides, this study found more factors; particularly factors that have statistically significant relationships.

The study also found fifteen reasons that could diminish the success of SFZ establishing projects. Other than the tobacco company interference, the study found that delays or no follow ups lead to failures of the projects. Other reasons for deterioration of successful implementation included, for instance, the traders changing minds with time to restart selling tobacco products, starting tobacco selling at alternative places, the influence of traders who did not stop selling tobacco have a close association with the said delays or no follow ups. Therefore, PHIs and other stakeholders are required to pay continuous attention in order to maintain their success.

Furthermore, authors tried to propose a process of establishing SFZs in Sri Lanka in future endeavors. These steps are based on the most frequented steps followed by the stakeholders in the process of establishing the studied SFZs. The lessons learnt in this study also taken in to consideration in this regard. The study found out that the delays or no follow ups is main reason for loss of success of SFZs. Moreover, the busy time-schedule of PHIs due to the heavy-duty list. Hence, giving responsibility to a steering committee will be beneficial for the betterment of SFZ. Authors also suggest merging step 4 and 5 to get better achievement. The previous studies also found out that community led initiatives based on Health Promotion approach are effective in establishing SFZs (Piyasumana et al., 2015). Consequently, authors suggest the following 10 steps process for future SFZs establishing projects in Sri Lanka (Figure 1).

The first step always is discussing with supervising officers and colleagues, and this is very important as there is statistically significant relationship between their enthusiasm and the sustainability of the project. Then, identification of boundaries of the proposed SFZ should be conducted according to the available resources and capacities. Factors explored in the SWOT matrix could be used in this regard. Stakeholders can select a zone where strengths and opportunities are high whereas the weaknesses and threats are comparatively less. After that a survey should be conducted to collect more data, and analyzing the gathered data will be beneficial to plan the project. The next step would be the discussions with traders' unions and other stakeholders, to create steering committee, and set targets. The study found that trade unions play a key role in establishing SFZs in Sri Lanka. Therefore, discussion with them is essential. Besides, discussions with constructive

groups identified by the study as much as possible will positively affect the sustainability of the SFZ. Step 5 is to create awareness among the community. It is important to strengthen the stakeholders and have better participation to achieve the targets. The studied SFZs have used various methods such as public lectures, distribution of leaflets, House-to-House awareness, displaying posters and billboards, street dramas, School debating competitions, art competitions, and anti-tobacco walks to create awareness among communities. A timeline should be set up to allow traders to finish available stocks of tobacco products. PHIs can take legal actions against those who violate the National Authority on Tobacco and Alcohol Act No. 27 of 2006. It will be helpful to improve the morale of the stakeholders. Stakeholders must be appreciated during the project tenure for the sustainability of the SFZ. Giving certificates and awards, being praised by the religious leaders, and being respected by school and Dharma school children are among the suggested means of achieving this goal. Besides, encouraging women and children to boycott shops where tobacco products are sold will be effective. Furthermore, continuing awareness of the stakeholders is essential. Continuous follow ups to early detection of problems, and taking remedial actions is the last step. Meanwhile, continuous attention has to be paid to the reasons for deteriorating success, as well as to avoid destructive groups.

Step 1	Discuss with supervising officers and colleagues
Step 2	Identify the boundaries of the Smoke Free Zone
Step 3	Conduct a survey and data analysis
Step 4	Discuss with traders unions and other stakeholders, creating steering committee and set targets
Step 5	Create awareness among community
Step 6	Set up a timeline and allow traders to finish available stocks of tobacco products
Step 7	Take legal actions against those who violate National Authority on Tobacco and Alcohol Act.
Step 8	Appreciate the stakeholders
Step 9	Continuous awareness of the stakeholders
Step 10	Continuous follow up to early detection of problems and take remedial action

Figure 1: *Suggested 10 steps process for establishing Smoke-Free Zones*

5. Conclusion

The study recommends employing the proposed 10 steps process to establish SFZs in Sri Lanka or in other countries which have similar socio-economic and cultural background with a preventive healthcare system. Developing strengths and opportunities while minimizing the weaknesses and threats are essential steps to create a supportive environment prior to establishing SFZs. Assistance of all constructive groups could be used for the project, and it is crucial to avoid destructive groups as much as possible to sustain the SFZs. Furthermore, paying continuous attention on the reasons for deteriorates success is essential to improve the sustainability.

6. Conflict of interest

Authors have no conflict of interest.

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