

## Research Article

# Changing Smoking Behavior of Staff at Dr. Zainoel Abidin Provincial General Hospital, Banda Aceh

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Smoking tobacco is a habit of individuals. Determinants of smoking behavior are multiple factors both within the individual and in the social environment around the individual. Staff smoking has been an undesirable phenomenon at Dr. Zainoel Abidin Provincial General Hospital in Banda Aceh. Health promotion efforts are a strategy that has resulted in behavioral changes with reductions in smoking by staff. This action research was designed to analyze changes in smoking behavior of hospital staff. The sample for this research was all 152 male staff who were smokers. The results of this research showed that Health Promotion Interventions (HPI) consisting of personal empowerment plus social support and advocacy to improve employee knowledge and attitudes influenced staff to stop or to significantly. HPI employed included counseling programs, distribution of antismoking leaflets, putting up antismoking posters, and installation of no smoking signs. These HPI proved effective to increase knowledge and create a positive attitude to nonsmoking that resulted in major reductions in smoking by staff when offsite and complete cessation of smoking whilst in the hospital. Continuous evaluation, monitoring, and strengthening of policies banning smoking should be maintained in all hospitals.

## 1. Introduction

*1.1. Background.* Human behavior is a reflection of various psychological tendencies that are based on stimuli from outside, both intentional and unintentional, having either positive responses or negative responses. Behavior has three domains that can be measured, namely, knowledge, attitudes, and practices. Knowledge and attitudes are passive responses, whereas practice is an active response.

Health behavior is a form of stimulus that is related to health and sickness. One form of unhealthy behavior is smoking tobacco or cigarettes. As described in Act number 36 of 2009, health is a state of health, including physical, mental, spiritual, and social health which allows everyone to live productively in a social and economic way. Smoking is an individual and/or group behavior which is injurious to the health of the smoker and also to the health of others through secondary smoking so that the individual who smokes can be categorized as unhealthy.

Cigarette smoking is a form of behavior that is a manifestation of specific needs that can be satisfied when a person smokes. Smoking behavior is the action of a person who sucks tobacco smoke into their own mouth and lungs. Smoking behaviour can be observed or measured by looking at the volume or frequency of smoking of that person [1].

In epidemiology, smoking tobacco, especially from cigarettes, is a worldwide health problem. The World Health Organization (WHO) predicts that by 2020 tobacco-related disease will be one of the world's major health problems and will cause approximately 8.4 million deaths every year. The incidence of men smoking in countries with low to middle incomes is very high, that is, 39% as compared to 35% for men in countries with middle to high incomes. Another health fact is that on average smokers die 13 to 14 years sooner than nonsmokers. Smoking results in macroeconomic losses. In Indonesia smokers smoke 230 billion cigarettes per year costing US\$14 billion per year; moreover, the medical costs or losses due to smoking, in Indonesia alone, amounted to

US\$185 million per year (WHO, 2011) which is 12 (twelve) times greater than the cost of the cigarettes themselves.

Smoking can cause harm to health because smoke from a tobacco cigarette contains over 7,000 chemicals, many of which are very dangerous to health, including many which can cause cancer especially the three main components of the smoke, namely, nicotine, tar, and carbon monoxide. In 2012, the WHO stated that smoking is a cause of cancer, heart disease, strokes, and lung diseases (including bronchitis, emphysema, and chronic pulmonary obstruction [CPO]).

Various studies have proven that smoking is extremely harmful to health. According to McEwen et al. [2], the leading causes of death associated with smoking are cancer, cardiovascular disease, and pulmonary diseases like bronchitis, emphysema, that is, COPD and pneumonia. Research at Sanglah General Hospital in Denpasar, Bali, showed that, amongst patients who sought treatment for pulmonary diseases, 71% of the patients who sought treatment for lung disease had been exposed to cigarette smoke. Of these 14% were active smokers, 42% were former smokers, and the rest, 15%, were passive smokers, that is, people who lived with smokers.

Some health workers in clinics, health centers, hospitals, and other health related institutions also smoke. Research by Cofta and Staszewski [3] at the Hospital of the Lord's Transfiguration in Poland found that 27% of health care personnel were smokers, 35% of these were nurses; what is more, 82% of them smoked at work. The research of Moneer et al. [4] at the National Cancer Institute, Cairo, Egypt, found 20% of health workers were active smokers, 5% were occasional smokers, and the rest, 75%, were nonsmokers.

Research by Nagle et al. [5] with nurses at six hospitals in New South Wales, Australia, found that knowledge amongst nurses about the damage to health caused by smoking significantly lowered the habit of smoking, whilst working and such knowledge tended to be influenced by information about smoking bans and awareness to change. This indicates that the continuous delivery of information to hospital employees both medical personnel and others can influence the health behavior of the employees concerned; in particular, it can result in the employees concerned changing, that is, reducing their smoking behavior.

The reasons a person smokes vary a lot. A person learns about smoking from their environment. Initially they observe people smoking. After they try smoking for the first time, some individuals may feel a desire to smoke again for a variety of reasons, for example, to reduce anxiety, to lose the feeling of overload and stress from work, to feel accepted within a particular group, and, for some, to relax especially because of stress from family or other problems.

When the smoking habit is already formed, social factors play an important role to keep the smoking behavior going. According to Kaplan and James [6], the tendency of individuals to continue to smoke is a phase to sustain the smoking behavior stage, that is, a stage in behavior due to a combination of psychological factors and biological mechanisms.

Smoking behavior is one type of behavior that can be changed. According to Notoatmodjo [7], change in behavior

can be categorized into three types: namely, (1) natural changes, mainly due to changes in the physical environment or to changes in social, cultural, or economic activities with respect to the individual; (2) planned change, that is, change in behavior due to planning by the individual concerned; and (3) change due to the willingness for change (readiness for change), that is, changes due to innovations and new programs that allow individuals to change. Changes can be rapid or slow depending on each individual's willingness. According to various experts behavior can be changed if it is based on strong intentions and a belief that such changes in behavior will be good plus there is strong motivation to change.

Behavior change according to Green [8] is influenced by three main factors, namely, (1) predisposing factors, that is, factors which more easily affect someone's behavior, amongst other things knowledge, beliefs, values, traditions, and so forth; (2) enabling factors, that is, factors that facilitate behavior or that enable action, and they include tools and infrastructure or facilities for the behaviors to be done; and (3) reinforcing factors (amplifier factors), that is, factors that encourage or strengthen the occurrence of the behavior concerned. Even if someone knows and is able to adopt healthy behavior, they sometimes do not do so for various reasons.

Smoking behavior can be changed; however, stopping smoking behavior is not an easy thing. Results from surveys conducted by the LMMM (*Lembaga Menanggulangi Masalah Merokok* or Foundation for Overcoming Smoking Problems) show that 66% of smokers have tried to quit smoking but have failed. Some failed because they did not know how to stop smoking and some failed because they said they found it too hard to concentrate when not smoking. Of the respondents who successfully quit smoking, 76% did so because of awareness itself, 16% because of illness, and 8% because of the demands of their profession according to Helman [9].

Changing the behavior of smoking of health workers or staff at a hospital is not an easy thing to do. Efforts to stop the smoking habits of staff in hospitals can be done with a health education approach. In general, hospital employees are individuals with a background of health who already understand and know about the impact of smoking tobacco and cigarettes and the effects of the smoke itself on others; nevertheless, it is a fact that many health workers smoke; thus, it can be assumed that the approach to change the behavior of hospital employees to get them to quit their smoking habit will not be easy. But one thing that can be done is to stop the staff who smoke from smoking in the hospital and its grounds.

This is supported by Public Health Act number 36 of 2009 that makes public places, in particular public hospitals, *No Smoking Areas (KTR or Kawasan Tanpa Rokok)*. A hospital is an institution that provides complete health services to individuals including in-patient, out-patient, and emergency services. One function of a hospital is (health) maintenance and improvement of individual health through complete health services according to medical needs. That is, a hospital is a place to get treatment that hopefully does not cause other

health issues such as health problems caused by cigarette smoke. A hospital is one place that must be a nonsmoking area or KTR. All areas in a hospital should always be clean and healthy to support all the efforts to heal the patients.

Restrictions on smoking in hospitals can be an initiation to smoking behavior changes, especially for hospital staff themselves. This is important to do considering health professionals are supposed to stay away from smoking and become role models for the community in the fight against the problems of smoking. But, in fact, many health workers at RSUDZA were not following the rules and policies to enforce the application of no smoking in the hospital and its grounds.

Health education efforts can teach hospital staff to stop smoking in the hospital and its grounds, especially with the commitment and support of the Director of the Hospital accompanied by supervision and enforcement of sanctions. This form of health education can be done through health promotion approaches. Health promotion interventions (HPI) to change smoking behavior in hospitals can include health education including information about the dangers of smoking, the chemicals contained in cigarettes, and the impact of smoking in general on smokers and others. Changes expected from HPI are an increase in knowledge, improved attitudes, and behavioral changes, by persons exposed to the HPI, to not smoke, especially in public places such as hospitals.

The concept of health promotion applications varies with the purpose of the public health behavior change concerned; one of them is through the learning process using stimulus and response. According to Notoatmodjo [7] the process of behavior change in fact is similar to the learning process, which consists of stimuli which are accepted or rejected, and if they are noted, understood, and accepted by the individual, they result in a change of attitude whence in the end an open reaction occurs with the change action occurring as expected. This concept in principle is relevant to the stimulus information which is conveyed about smoking, the dangers of smoking, and ways of stopping smoking through media used in HPI, so that gradually an attitude is born and grows to change, that is, to quit or reduce smoking behavior.

Smoking in the Dr. Zainoel Abidin Provincial General Hospital (RSUDZA) in Banda Aceh and in the hospital grounds was still a health problem. Numerous attempts had been made by the management of the RSUDZA strengthened by policies implemented by the Director of the RSUDZA with oversight conducted by the hospital's Peoples Health Promotion Unit (PKMRS). These had also been strengthened by new regulations with the issue of a city-wide Regulation (Perda) number 6 of 2011, to make all public areas in the City of Banda Aceh nonsmoking areas. However, all these efforts had yet to bear fruit and many visitors and even hospital staff and sometimes even patients could still be found smoking in the hospital and its grounds.

All the data and facts above indicated that the phenomenon of smoking in the hospital and its grounds still remained a health problem and a social problem for a variety of reasons. Although smoking had been banned by regulations and supervision was also being carried out, the habit was still there, so some more effective methods were still

needed so that staff and also patients and visitors would no longer smoke in the hospital and its grounds.

One method that can be done is to use HPI approaches to empower hospital staff to adopt healthy behavior with outreach, that is, use of media with social support approaches including seminars, counseling, and partnerships with advocacy. The HPI can build on the commitment of the hospital Director as well as the support of regulatory oversight to stop smoking in the hospital and its grounds. HPI approaches are effective for raising awareness amongst staff to quit smoking even though only in the hospital and its grounds.

Based on the above background, this research effort has been directed at finding effective HPI methods that can be applied to modify the behavior of employees who smoke to (a) stop smoking in the hospital and its grounds and (b) to quit or reduce smoking altogether.

*1.2. Problems.* The phenomenon of smoking by staff of the RSUDZA in Banda Aceh has had implications for the health functions of the organization and for the human resource functions for health because, as the premier hospital in Aceh, it should play an active role and set a leading example in the health recovery efforts for all the patients that come to the hospital.

Stopping smoking by staff is not an easy goal. Ways that can be used to try to achieve this goal include HPI, that is, health education and health promotion approaches, empowering staff, providing social support and advocacy plus the wholehearted commitment of the Director, and the implementation and enforcement of no smoking regulations. In summary, the research problem formulated is how can the use of HPI, that is, health promotion activities, empowerment, advocacy, and social support, influence all the staff of RSUDZA to (a) quit smoking in the hospital and its grounds and (b) quit or reduce smoking altogether.

*1.3. Research Question.* The problems posed above are summarized in the following research question: can health promotion interventions (HPI) including increasing knowledge about the dangers of smoking plus building positive attitudes for behavioral change amongst smokers result in all the medical staff of RSUDZA (a) quitting smoking in the hospital and its grounds and (b) quitting or reducing smoking altogether?

*1.4. Research Objective.* The purpose of this study was to analyze the influence of various HPI to get each and every member of the RSUDZA medical staff who smokes to change their smoking behavior and henceforth (a) to quit smoking in the hospital and its grounds and (b) to quit or reduce their individual smoking habits altogether.

*1.5. Hypothesis.* The hypothesis for this study is "There are Health Promotion Interventions (HPI) that can influence the behavior of employees at RSUDZA to (a) quit smoking in the hospital and its grounds and (b) to quit or reduce the smoking habit altogether".

*1.6. Benefits of This Research.* The benefits of this research are that it can be an input or reference that is useful for improving the effectiveness of HPI in order to get all the staff and workers at RSUZA (a) to stop smoking in the hospital and its grounds and (b) to quit or reduce their smoking habit altogether. It is also expected that this research can contribute to improvements in the effectiveness of HPI to stop and/or to reduce the smoking habit throughout Aceh Province, especially in other hospitals, health centers, and public facilities.

## 2. Research Methods

*2.1. Type of Research.* This research is action research that aims to find and analyze the influence of various HPI, in particular, employee empowerment and also social support and advocacy to change the behavior of hospital staff (a) to quit smoking in the RSUZA Hospital and its grounds and (b) to quit or reduce smoking altogether. This type of research can analyze and reveal facts and phenomena that arise in the ongoing research. Interventions in the research may be changed in accordance with conditions and situations found in the field. Action research is an integrated approach that is both quantitative and qualitative.

*2.2. Population and Research Samples.* The population for this study, who were exposed to the HPI, were all 862 medical staff of Dr. Zainoel Abidin Provincial General Hospital {RSUZA} in Banda Aceh. The sample selected was all medical staff who admitted that they smoked, 152 individuals in all.

The control group population were from the medical staff at a different hospital in Banda Aceh where there were no HPI interventions, namely, RS Meuraxa, which is some distance from RSUZA (about 7 km to the south). The control group also had a total of 152 medical staff who were self-admitted smokers.

*2.3. Antismoking Interventions.* Over 50 posters, including some very graphic ones (refer Appendix), were placed at strategic locations throughout the hospital. Antismoking signs were put up throughout the hospital and were also erected in the grounds. Counseling, of smokers, was given for 45 minutes a day, between 8 and 9 am, every working day (i.e., Monday to Friday); counseling was conducted by the Director himself and by specialist doctors and others in particular by persons who had suffered major illnesses as a result of smoking. Details of the interventions and illustrations of the posters and signs are in the Appendix.

*2.4. Data Analysis.* Data analysis in this research included analysis of bivariate tests using Chi-square and Fisher's exact test, independent *t*-test, and nonparametric Mann-Whitney tests. Independent *t*-test was conducted at 95% confidence level and the Wilcoxon rank test was conducted at 95% confidence level. Multivariate analysis used multiple logistic regression tests.

TABLE 1: Knowledge and attitudes of the staff before and after the tests.

| Stage    | Knowledge |    |          |    | Attitude |    |          |    |
|----------|-----------|----|----------|----|----------|----|----------|----|
|          | Good      |    | Poor     |    | Positive |    | Negative |    |
|          | <i>n</i>  | %  | <i>N</i> | %  | <i>n</i> | %  | <i>n</i> | %  |
| Pretest  | 87        | 57 | 65       | 42 | 86       | 57 | 66       | 42 |
| Posttest | 109       | 71 | 43       | 28 | 116      | 76 | 36       | 23 |

TABLE 2: Description of smoking behavior of smoking medical staff.

| Smoking behavior |  | ( <i>n</i> ) | (%) |
|------------------|--|--------------|-----|
| Pretest          |  |              |     |
| 1                | Light smokers (1–5 cigarettes/day)     | 77           | 51  |
| 2                | Moderate smokers (6–15 cigarettes/day) | 37           | 24  |
| 3                | Heavy smokers (>15 cigarettes/day)     | 38           | 25  |
| Total            |  | 152          | 100 |
| Posttest         |  |              |     |
| 1                | Light smokers                          | 83           | 54  |
| 2                | Moderate smokers                       | 17           | 11  |
| 3                | Heavy smokers                          | 14           | 9   |
| 4                | No longer a smoker                     | 38           | 25  |
| Total            |  | 152          | 100 |

## 3. Results and Discussion

*3.1. Knowledge and Attitudes of Staff before and after the Tests.* The results of this research showed that the proportion of respondents with good knowledge and attitudes before the pretest were 57%. Then, after the interventions (posttest), there was an increase in respondents' knowledge to 71%, that is, an increase of 14%, and also an increase in those with positive attitudes to 76%, that is, an increase of 19% (refer Table 1).

*3.2. Change in Smoking Behavior in the RSUZA Hospital and Its Grounds.* As a result of the HPI interventions including more rigorous policing against smokers, smoking has been totally stopped within the hospital and its grounds by all staff and workers plus also by all patients and visitors.

*3.3. Changes in Smoking Behavior of Smoking Staff (Smoking Away from the Hospital and Its Grounds).* Table 2 shows that the highest proportion of respondents in the pretest was the light smokers with 51%. After the interventions (posttest) the proportion of respondents that were light smokers increased to 54% whilst moderate smokers more than halved with a decrease from 24% to 11% and nearly two-thirds of heavy smokers reduced their smoking significantly with a decrease from 25% to 9% and most significantly 38 or 25% of respondents quit smoking, that is, stopped smoking altogether. Thus, between 44 (29%) and 82 (54%) of the intervention group completely stopped or reduced their smoking with up to 44 (29%) reducing their smoking and becoming light smokers only (the number of light smokers increased from 77 to 83) (refer Table 2).

TABLE 3: Differences in knowledge, positive attitudes, and smoking behavior of staff before and after the interventions.

| Variable     | Mean pretest | Mean posttest | Mean difference | Z      | P      |
|--------------|--------------|---------------|-----------------|--------|--------|
| Knowledge    | 30           | 33            | 3               | -8.719 | 0.001* |
| Attitude     | 83           | 89            | 6               | -7.644 | 0.001* |
| Quit smoking | 8            | 3             | -5              | -4.219 | 0.001* |

\*Significant  $\alpha \leq 0.05$ .

TABLE 4: Multiple log regression models of interventions against the behavior of quitting smoking.

| Variable                       | B      | B. (Exp.) | P      |
|--------------------------------|--------|-----------|--------|
| Constant                       | -9.103 |           |        |
| Knowledge                      | 1.641  | 5.162     | 0.001* |
| Attitude                       | 1.682  | 5.375     | 0.004* |
| Health Promotion Interventions | 2.481  | 11.949    | 0.001* |

\*Significant  $\alpha \leq 0.05$ .

3.4. *Differences in Knowledge, Positive Attitudes, and Smoking Behavior of Staff before and after the Interventions.* Table 3 shows that there are differences in the intervention group means of 3.03. Statistical analysis of the results using *t*-test showed that there was a significant increase in knowledge between the pre- and the posttests with a probability value of 0.001 ( $P < 0.05$ ).

Based on attitudes, there was a mean increase in the positive attitude of the respondents of 6%. Dependent *t*-test results show that there was a significant increase in staff with a positive attitude before and after the test with a difference of -7.644 and a score of  $P = 0.001$ .

3.5. *Differences in Knowledge, Positive Attitudes, and Behavior of Staff to Quit Smoking before and after HPI.* The results of the multivariate analyses used a log regression test. The final multiple regression log model results are set out in Table 4.

Table 4 shows there are two variables that predict changes in the smoking behavior of staff at RSUZA as a result of health promotion interventions ( $P = 0.001$ : OR = 11.949). These two variables are knowledge ( $P = 0.001$ : OR = 5.162) and attitude ( $P = 0.004$ : OR = 5.375).

This indicates that the intervention campaign conducted with guidance, lectures, discussions, leaflets, and brochures effectively increased such knowledge amongst the intervention group, that is, the staff who smoked from RSUZA. The control group, who were from a different hospital in Banda Aceh, RS Meuraxa, also increased their average score, but only by 0.05; that is, the score was stable; thus, statistically there was no difference in knowledge from the start to the end of the program amongst the control group where there was no intervention campaign.

The formula used for calculating the multiple log regressions is as follows:

$$\text{Logit}(Y) = a + b_1 X_1$$

$$\text{Logit}(\text{quit smoking behavior}) = a + b_1 X_1 + b_2 X_2$$

$X_1 = \text{Health Promotion Intervention}$

$X_2 = \text{Attitude.}$

(1)

Thus, the calculations are as follows:

$$Y = a + 2.317X_1 + 1.528$$

$$Y = -6.214 + 2.317 (\text{Health Promotion Intervention})$$

$$+ 1.528 (\text{Attitude})$$

(2)

$$P_1(x) = \frac{1}{1 + e^{1(-6.214+2.317+1.528*1)}} = \frac{1}{1 + e^{1(-2.369)}}$$

$$P_1(x) = 0.916 \rightarrow 91.6\%.$$

The proportion of those smokers amongst RSUZA staff who reduced their smoking behavior as a result of the health promotion intervention plus information (about the dangers of smoking) and who had a positive attitude was 91.6%.

The most important variables that influenced the quitting smoking behavior change were the health promotion intervention and the employee's attitude variables; thus, the staff who were exposed to the health promotion intervention were 11.949 times more likely to reduce smoking behavior than staff who were not exposed to it. Similarly staff with a positive attitude to quit smoking were 5.375 times more likely to reduce smoking behavior than staff with a negative attitude to it.

3.6. *The Influence of Increasing Knowledge (about the Dangers of Smoking) from HPI Interventions amongst Staff Who Smoke.*

Results of the independent *t*-test indicated that there was a significant difference in knowledge (about the dangers of smoking) between the pretest and the posttest. This indicates that the intervention campaign conducted with guidance, lectures, discussions, leaflets, and brochures effectively increased such knowledge amongst the intervention group who were staff from RSUZA. The control group, who were from a different hospital in Banda Aceh, RS Meuraxa, also increased their average score but only by 0.05; that is, the score was stable; thus, statistically there was no difference in knowledge before and after the tests/interventions (amongst the control group).

Increases in knowledge amongst the staff in the intervention group are understandable because the information contained in such health promotion interventions could be easily internalized by staff. The information was also easily made available to the employees during their routines at the hospital through banners, leaflets, and posters that were strategically placed throughout the hospital. Moreover, as the majority of the hospital employees have had higher education (mostly in health) with high-level diplomas, degrees, and postgraduate qualifications they can very easily absorb information about health. Increases in knowledge about the harm from smoking and the motivations to quit smoking varied considerably amongst the employees in the intervention group. Although employees in hospitals work in a health profession, this does not guarantee they will not smoke.

Knowledge of the dangers of smoking does not guarantee that doctors, dentists, and other health care personnel will avoid this risky behavior.

Effective media can support the delivery of the message from the facilitator because suitable media can stimulate the thoughts, feelings, concerns, objectives, and interests of the target group during the learning process.

*3.7. The Influence of HPI to Increase Employees' Positive Attitudes to Stop Smoking.* The attitudes in this research are the awareness and willingness of employees of RSUZA to learn about the dangers of smoking and their willingness to avoid the dangers of smoking and to adopt antismoking attitudes. There are three phases of awareness: the first phase, awareness of the dangers of smoking; the second phase, avoiding the dangers of smoking; and the third phase, adopting antismoking attitudes. Attitudes towards health can be defined as a form of reaction to feelings that can be supported or not, provoking thought and a tendency to adopt behavior that tends towards good health, free from pain or illness, not only physically but also mentally.

The results showed that 57% of the staff had a positive attitude towards nonsmoking before the pretests; this increased to 76% after the interventions, meaning that there was an increase of 19% in the positive attitude to nonsmoking. Awareness of the dangers of smoking showed little increase: from 57% strongly agreeing in the pretest to 59% in the posttests, after the interventions. However most of the respondents very much agreed when asked about the dangers of smoking to family health. Consciousness of the need to not smoke in nonsmoking areas increased from 42% in the pretest to 53% after the interventions. Whilst 35% of the sample had a positive attitude towards the will to quit smoking by removing the sense of dependence on cigarettes, 53% had a positive attitude towards antismoking programs and friends that are antismoking.

These results showed that the (hospital) staff tended to have a positive attitude towards quitting smoking. This showed that the staff of the hospital already have awareness of the desirability to quit smoking. This can be understood because generally they have a background education in health; however, factually some also had the habit of smoking. That means that the formation of consciousness or a positive attitude towards antismoking or interventions to quit smoking had not yet sparked real actions to quit smoking or at least to reduce smoking.

Independent *t*-test results showed there were significant differences in attitudes before the interventions (pretest) compared with the attitudes after the interventions (posttest). This is indicated by the value of the probability of less than 0.005 with a 95% level of certainty and a value of  $t = -7.974$ , meaning the difference in attitudes before and after the intervention was 9.72.

In line with the effectiveness of health promotion knowledge, the attitudes of the staff also changed after the health promotion interventions were conducted in the hospital and its grounds. This was a real change resulting from the internalization of information by the staff about the dangers

of smoking, the impact of smoking, and changes in behavior needed to stop smoking. A positive or negative attitude to things concerned with cigarettes will strongly influence whether someone's smoking behavior tends to be high or not.

Interventions to promote health through health promotion media will increase knowledge and increase positive attitudes in staff towards the dangers of smoking. Results of regression tests showed that the staff with positive attitudes were 5.3 times more likely to stop smoking compared to the staff with a negative attitude. This fact shows that internalization of knowledge which the staff already have about smoking will slowly change attitudes and willingness to begin to stop smoking. Health information interventions connected to stopping smoking in public places and the dangers of smoking for personal health will form attitudes and willingness to start stopping smoking with reduction in the number of cigarettes smoked until eventually, hopefully, smoking is stopped altogether.

*3.8. The Influence of HPI to Get Staff to Stop Smoking.* Stopping smoking is a real-life form of individual behavior change to reduce smoking and/or not to smoke again. Results of statistical tests with Mann-Whitney tests show that the smoking behavior pretest of the intervention group with a mean value 8.38 versus 7.92 in the control group and average differences of 0.769 showed no difference because the value of the probability was 0.699 ( $P > 0.05$ ), whilst the smoking behavior in the posttest had an average difference of 0.549 which showed significant differences in the smoking behavior between the intervention group and the control group with a value of  $P = 0.002$  ( $P < 0.05$ ), which means that with a 95% level of confidence the health promotion interventions have influenced changes in the smoking behavior of those exposed to the HPI interventions. Independent *t*-test results showed significant differences in the smoking behavior before and after the interventions which is indicated by the value of the probability being less than 0.05 ( $P = 0.002$ ) at a 95% level of confidence with the value of  $t = -3.040$ .

HPI conducted in phases, starting from the stage of empowerment to counseling conducted en masse and in groups with messages about the chemicals in cigarettes, the effects of cigarettes, and ways to stop smoking were given by researchers, religious leaders, and a specialist doctor in pulmonary diseases as well as a former smoking addict who, *nota bene*, was also a specialist in radiology. This strategy provided a positive impact to decrease the number of heavy smokers (smoking more than 15 cigarettes per day) and also to increase the number of smokers who decided to stop smoking altogether. This happened because there was information directly from people who had already had serious health problems as a result of smoking and had had to undergo major treatment to regain their health.

Besides messages in media such as leaflets, flyers, and banners containing antismoking messages (refer Appendix), there were also photographs and messages from public officials in particular the Mayor and Deputy Mayor of Banda Aceh to show that efforts to combat smoking cigarettes were very strongly supported by the City of Banda Aceh.

The smoking behavior of the hospital medical staff generally started during early adulthood. The phenomenon of starting the smoking habit in early adulthood has different causes than with teenagers. According to *social stress models*, the use of addictive substances is one way for persons to overcome various stresses which they are experiencing. These stresses can arise from family (problems) or work (problems) or even from a poor environment. One response arising from such stress is the appearance of negative emotions, in particular, sadness, anger, and distress.

Such circumstances create environmental factors with the potential to influence the smoking behavior of people. Basically hospital staff understand that smoking can cause impairment of health, can affect the local environment, and can impact others as the hospital staff in general have health education background; thus, 79% of the staff in the intervention group already had an intention to stop smoking and 69% of the control group also intended to stop smoking. One of the reasons why they wanted to stop smoking was that smoking at home was not accepted by their families plus there were pressures at work to stop smoking. However, some staff who were depressed still wanted to smoke to calm themselves.

Although a lot of hospital staff already wanted to quit smoking, many still smoked. Some said “*it is very difficult to quit smoking*” because it is an addiction and they relapsed and returned to smoking if they had any stress or problems. An intention to change is a positive precedent for behavior change. According to various experts people behave based on ways that make sense considering the impact of such behavior. An action to stop smoking needs a strong intention. Any attempt to stop smoking is not easy, because we have to change previous habitual behaviors into new habits.

In accordance with the concept of behavior change expressed by Rogers and Shoemaker [10] in the theory of the *Innovation decision process*, behavior change is defined as the psychological process experienced by an individual, after receiving information or knowledge about a new concept, until such time as he accepts that new concept. If the acceptance of a new behavior through the adoption process is based on knowledge, awareness, and a positive attitude, then the behavior is likely to be long-lasting. On the contrary, if behavior change is not based on knowledge and awareness it will not last long.

Changes in the behavior of hospital staff to quit smoking can be done in various ways, for example, by HPI and/or by special therapy, as well as with stimulant health education; namely, stimulation is given to reduce internalization; that is, thinking about smoking also hypnotherapy can be used.

One strategic way to change (smoking) behavior is through health promotion interventions (HPI). This research has proven that HPI can change the behavior of people to reduce the number of cigarettes smoked per day; for example, heavy smokers can become medium or light smokers or can even quit smoking altogether.

The formation of awareness for smokers who want to quit is a must if they really want to stop. Then, after smokers really have awareness to stop smoking with actions or concrete activities, they need to get a touch of the dimension of affection. This is to reinforce the willingness to quit,

so the person and the event are really well connected and so that there will be a deep memory trace, and this memory trace will in turn give reinforcement to not start again.

If the intention to quit smoking is strong or high then the smoking behavior will be weak. Nevertheless, the intention to quit smoking will still be affected by several factors, namely, attitudes towards smoking, social support, and the ability which the smoker feels to be able to stop smoking. When his attitude towards smoking is negative (he feels unhappy to smoke and/or he wants to stop smoking) and social support (from his environment) to quit smoking is also high and the individual concerned feels highly able to effectively stop smoking, the intention and ability to stop smoking are also stronger and vice versa.

To implement a successful smoking prevention strategy it can be concluded that strategic efforts must be made by the management of the organization. These include tight supervision to totally stop smoking in the hospital and its grounds, implementing appropriate sanctions (for transgressors), banning the sale of cigarettes in the hospital and its grounds plus also increasing health promotions, and doing reevaluations every three months. Also it may be advisable to renew the HPI from time to time.

Three of the 152 individuals in the control group who did not receive the interventions also quit smoking. The reason for one person stopping smoking was that he became the Director of the hospital, so he felt ashamed to smoke in the hospital, and the reason for the others to stop was that they were in severe pain which doctors diagnosed to be due to smoking, so they also quit smoking.

The commitment of the Mayor of the City of Banda Aceh to ban smoking in public places also helped. The Mayor and Council have made bylaws and socialized them to make public places nonsmoking areas. As reported by the Serambi Daily newspaper on 31st May, 2013, the Government of Banda Aceh have made stickers for socializing smoking bans in public transport, that is, minibuses or “*labi-labi*,” so that people are exhorted to change behavior and become “*ashamed*” to smoke in public. In general the nonsmoking areas where smoking is banned are public places including health facilities, schools, and places where people are teaching and learning, plus children’s playing areas, places of worship, workplaces, sports facilities, public transport, and indoor public areas. People have not yet responded 100% to the bylaw, so sometimes people can still be seen smoking in public places. Quitting smoking is possible and is an absolute must, even though smoking has become almost inseparable from the everyday life of many people.

**3.9. Reasons to Stop Smoking.** Interventions conducted by the researchers with the health promotion approach resulted in positive impacts and positive behavior changes with all staff stopping all smoking in the hospital and its grounds. Qualitatively, the reasons to stop smoking included information from the experience of *key note speakers* for the HPI activities plus visual information in a video about the dangers of smoking in the short, medium, and long term based on personal experiences including the high cost to

clean all the blood vessels in a patient's body from nicotine (a dangerous substance in cigarettes). The format of the messages was the real evidence of damage to parts of the body due to nicotine and other harmful substances in cigarettes. This was demonstrated step by step in a video. Practically, these visuals provided real stimulus for change and for the intention to quit smoking. This shows that appropriate intervention materials presented to targets by appropriate media and mechanisms can give a positive impact to change the attitudes and behavior of persons to make them want to quit smoking.

One speaker suggested that those persons who have already had experience in stopping smoking can contribute their thoughts to other staff to enable them to quit smoking. Indeed, one reason for RSUZA staff to quit smoking is the commitment of the leadership of the hospital both to support the promotion of the program to quit smoking in the hospital and to provide support for advocacy and meetings, and the Director himself even took a lead in the advocacy sessions. This resulted in smokers at RSUZA quitting out of a sense of honor and respect for the hospital leader who was so committed to get all of his employees not to smoke.

This commitment was also supported by tight supervision against smoking in the hospital and its grounds, that is, by empowering security officers to reprimand smokers caught smoking in the hospital grounds. Indeed this commitment was the highest choice selected by the participants that wanted to stop smoking and was supported by the commitment of the Director who instructed that the hospital and all its grounds must be free from cigarette smoke.

Quinn and Snyder [11] argue that people need to be empowered to realize deep change or transformation. They call their program ACT or Advanced Change Theory. Thus, changes made by the Director to consistently ensure supervision and enforcement to stop all smoking in the hospital and its grounds were able to transform the hospital and its grounds into a no smoking oasis. Leading by example and campaigning to stop smoking is one role of the hospital as a health unit to serve the community.

Results that have been achieved recently include the passing of the No Smoking Areas (NSA) Law (Qanun KTR), plus socialization of the resultant ban on smoking in public places and also celebration of Tobacco Free Day. Socializing the ban was done to all walks of life through leaflets, posters, and banners distributed throughout all Government offices and private as well as public transportation (minibuses and buses) both intraprovincially to all districts and cities in Aceh and interprovincially to provinces outside Aceh; besides, the hospital made a commitment to monitor the implementation of the NSA Law (KTR Qanun).

The fact that the hospital Director was so concerned and committed to stop smoking in the hospital and its grounds was an important factor to motivate some staff to stop smoking in the hospital and its grounds. The Director is the highest authority in the hierarchy of the hospital; he has full power to make decisions concerning human resource management in the hospital. Staff are reluctant to go against his directions and are expected to support what is requested by their leader including not to smoke in the hospital and its

grounds, even though such (conforming) behavior may only be shown in front of the leader or only in the hospital and its grounds. The hospital is a social environment that has various characteristics including hierarchical interactions. According to Giddens [12], social life is more than just individual actions but social life is also not just determined by social forces, meaning that the overall actions and activities performed in the hospital tend to also have social power, considering that all actions of the hospital staff have a social interaction too. The message from the hospital policy initiated by the Director not to smoke in the hospital and its grounds is information received by all its staff so that there is a positive interaction to mutually stop all smoking in the hospital and its grounds whether by staff, patients, or visitors. In addition, the Director in the context of the hospital structure is a free agent (who can set an example) as well as being the top figure in the structure so that he has a dual role which provides social strength to make a successful program to stop smoking in the hospital and its grounds.

In addition, another reason to stop smoking is the psychological burden each member of staff has as a health worker, meaning that there is awareness of the importance of eventually quitting all smoking in particular due to the HPI interventions of this action research program.

#### 4. Conclusions and Suggestions

The HPI interventions implemented significantly influenced an increase in knowledge about the dangers of smoking amongst the staff and influenced positive attitudes to stop all smoking in RSUZA Banda Aceh, with the following results.

- (1) Smoking within the hospital and its grounds has been completely stopped including smoking by all staff, patients, and visitors.
- (2) The number of smokers in the medical staff intervention group smoking away from the hospital decreased from 100% to 75% (i.e., a decrease of 25%).
- (3) As above the number of heavy smokers (>15 cigarettes/day) decreased from 25% to 9% in the intervention group.
- (4) Also the number of moderate smokers (6–15 cigarettes/day) in the intervention group decreased from 24% to 12%.
- (5) But the number of light smokers (1–5 cigarettes/day) in the intervention group showed a small increase from 50% to 54%.

Logistic regression tests on the results showed that the variable that most affected the behavior changes to quit smoking is the HPI (health promotion intervention) with a value OR 11.949. This means that staff provided with health promotion interventions were 11.949 times more likely to quit smoking compared to staff who were not given HPI.

HPI conducted through mass, group, and individual counseling improved employee knowledge about the dangers of smoking, so they assisted change in behavior of the RSUDZA medical staff and assisted some of them to quit smoking.



TABLE 5: Health promotion interventions strategies to change behavior of smoking staff.

| Approach       | Purpose   | Intervention   | Frequency   |
|----------------|---|--|---|
| Empowerment    | Provide and/or increase knowledge, awareness, and attitudes amongst staff towards the dangers of smoking                      | (i) Information campaign to staff conducted en masse and in groups | (i) 45 minutes twice weekly for 4 months                                  |
|                |   | (ii) Distributing printed leaflets                                 | (ii) 5 types of media viz: Posters, Leaflets, Handouts, Stickers, Banners |
|                |   | (iii) Putting up posters in the hospital and its grounds           | (iii) For 4 months, some, e.g., banners changed often                     |
|                |   | (iv) Putting up <b>no smoking</b> signs                            | (iv) Permanent signs  |
| Social support | Provide technical support for implementing the decisions to ban smoking in the hospital and its grounds                       | (i) Socialization  | (iv) Once every 4 months  |
|                |   | (ii) Consultations   | (ii) Every month for 4 months   |
|                |   | (iii) Workshop   | (iii) Once every 4 months   |
| Advocacy       | Provide support, direction, and written/printed decisions concerning the banning of smoking in RSUZA hospital and its grounds | (i) Audiences  | (i) 6 times every 4 months (i.e., about every 3 weeks)                    |
|                |   | (ii) Consultations   | (ii) 6 times every 4 months   |
|                |   | (iii) Meetings   | (iii) 6 times every 4 months  |
|                |   | (iv) Reports   | (iv) Every month for 4 months   |

Schematically, the strategy to increase knowledge, change attitudes, and change smoking behavior of the RSUZA medical staff is as shown in the figure below:

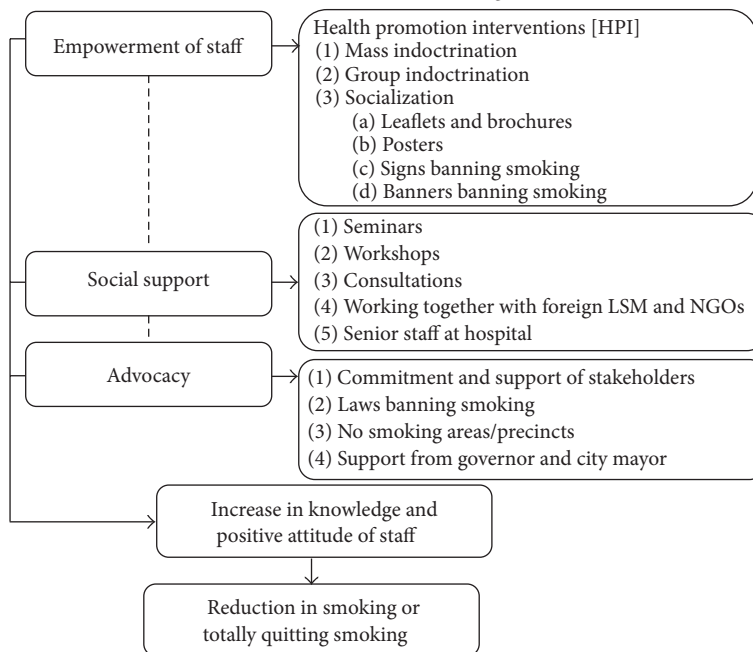


FIGURE 1: Model for change in smoking behavior of staff at RSUZA Hospital. Strategy for increasing knowledge, improving attitudes, and changing smoking behavior amongst the staff at the RSUZA Hospital.

Putting up posters about the dangers of smoking in the hospital and its grounds and installation of signs banning smoking at strategic locations throughout the hospital created a positive attitude amongst staff and a conducive environment for all staff, workers, patients, and visitors to not smoke in the RSUZA Hospital and its grounds. Strategic empowerment,

social support, and advocacy carried out comprehensively and continuously can change behavior to reduce smoking and even got some staff to stop smoking away from the hospital.

It turns out that the commitment of the hospital Director can influence medical staff to change their smoking behavior. These changes can be done by making regulations for no



(a)



(b)

FIGURE 2: (a) Horror wall poster citing effects of smoking. (b) Another horror wall poster showing effects of smoking Both posters in both Acehnese and Indonesian languages.



(a)



(b)

FIGURE 3: Examples of antismoking wall signs, free-standing signs, and wall posters used.

smoking in a hospital and its grounds and by close supervision of staff to ensure they do not smoke in the hospital and its grounds.

*Suggestions*

- (1) The Government of Aceh Province, the City of Banda Aceh, and other districts in Aceh through the Aceh Provincial Health Department and City and District Health Departments need to
  - (a) run routine quarterly evaluations of the implementation of the policy of nonsmoking areas in public places, particularly in hospitals;
  - (b) immediately set out and pass Qanuns or local laws to implement smoke-free areas throughout the Province of Aceh, in order to reduce the number of smokers in public places in

the Province of Aceh, particularly in hospitals and other health facilities;

- (c) set policies for oversight mechanisms and technical surveillance to ensure no smoking policy in designated No Smoking Areas;
  - (d) program FPI in other public institutions;
  - (e) place thousands of posters, leaflets, and banners in public places providing information about the dangers of smoking.
- (2) Dr. Zainoel Abidin Provincial General Hospital (RSUDZA) in Banda Aceh needs to
    - (a) continue to thoroughly implement the KTR (smoke-free area) policy in the hospital and its grounds including policy of the no smoking condition and prohibiting the sale of cigarettes



FIGURE 4: (a) Left above: example of freestanding “No Smoking Area” sign erected outside. Centre: example of No Smoking wall poster. Below: example of “No Smoking Area” wall sign. (b) Above: Thank You for Your Attention with no smoking sign used in slide presentations.

in the hospital and its grounds, so that the hospital areas are completely free from cigarette smoke;

- (b) have systematic and structured surveillance as well as strict sanctions implemented by the Director of the hospital imposed on all staff, workers, patients and visitors who dare to try to smoke in the hospital or its grounds;
- (c) sustain and continue the HPI that have been introduced in partnerships with other associated institutions to increase the awareness of staff and of patients in the hospital as well as visitors of the hospital to stop smoking;
- (d) continuously maintain the present policies of the Director of RSUZA to be monitored and committed to no smoking policy in the hospital and its grounds in spite of any changes and new dynamics that may be introduced by future directors of RSUZA;
- (e) have support for the commitment by the Director of RSUZA Banda Aceh to continue the policy of banning smoking in the RSUDZA hospital and its grounds in order to allow the hospital management to continuously maintain the ban in the future.

#### Recommendations for Academia

- (1) Follow-up studies need to be done with regard to other types of health promotion interventions (HPI) using comparative analysis for different media and other variables in hospital management.
- (2) There is a need for further study and analysis of policies and methods of intervention to get behavior change to stop smoking that can be a reference for implementation in other hospitals and institutions.

## Appendix

See Table 5 and Figures 1, 2, 3, and 4.

### Definitions

- Smoking behavior: Smoking of cigarettes, cigars, and/or pipe tobacco regularly
- Quit or stop smoking: Stopping smoking behavior altogether
- Reduced smoking: Going down from one smoking level to a lower one.

### Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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