

# A Comprehensive Review of the Applications of Protection Motivation Theory in Health Related Behaviors

S. Rajendran<sup>1\*</sup>, V.M. Shenbagaraman<sup>2</sup>

<sup>1</sup>Faculty of Engineering & Technology, SRM University, India

<sup>2</sup>Faculty of Management Studies, SRM University, India

\*Corresponding author: E-Mail: rajendran.s@ktr.srmuniv.ac.in

## ABSTRACT

The prevalence of health related behavior varies across different socio-demographic groups. Studies also have shown that people in different countries exhibit varying type of health behavior because of their culture. The thoughts and feelings an individual has towards one's health indicate his/her health related behavior. Social cognition models are generally used to study the behavior of human beings. Protection motivation theory (PMT) is one of the widely used models to study and analyze the health behavior. This paper reviews the applications of PMT in the field of healthcare, like drug abuse, alcohol addiction, cigarette smoking, unsafe sex, adhering medical prescriptions for different ailments and following healthy diet, etc. The constructs that are better suited for such applications are analyzed and the success of PMT as a suitable model for studying health related behavior discussed. The main purpose is to encourage researchers to study the health behavior of Indians and find ways to improve that using PMT.

**KEY WORDS:** socio-demographic groups, social cognition theory, protection motivation theory, health related behavior.

## 1. INTRODUCTION

People from different countries have their own beliefs and behaviors related to health and illnesses that come from cultural background and individual experiences and perceptions. Though the literature is abound with research articles using behavioral theory from USA, UK, and Canada, we find, to the best of our knowledge, very little study to improve the health related behaviors in India. The main objective of this descriptive review paper is to urge researchers to study Indians behavior and compare with the findings from other countries.

Many theories have been developed to envisage, elucidate, and amend the health behavior of people. The theories may be classified into social cognition models and stage models. The social cognitive models deal with theories that specify cognitive and affective factors as the determinants of behavior whereas the stage models, through a sequence of discrete and distinct stages, observe the change in behavior (Sutton 2001; Conner 2010). The social cognition models include the Health Belief Model, Protection Motivation Theory, Theory of Reasoned Action/Theory of Planned Behavior, and Social Cognitive Theory. Protection Motivation Theory (PMT) was first introduced by Rogers (1975), to better understand the effects of fear appeals on health-related attitude and behavior. In 1983, he revised it to an extended PMT with emphasis on the cognitive processes of mediating behavioral change. It is also stated that PMT (Rogers, 1983) is based on the work of Lazarus (1966) and Leventhal (1970) resulting in threat and coping appraisal processes.

PMT suggests four factors that influence a person's intentions to safeguard him from any harmful or threatening event. The factors are (i) the severity of the harmful or threatening event (perceived severity), (ii) the likelihood of the event occurring (vulnerability), (iii) the effectiveness of the planned preventive steps (response efficacy) and (iv) the ability of the person in executing the plan to reduce the effect of threatening event (self-efficacy). The perceived severity and the vulnerability are used to determine the threat appraisal which indicates the degree of significance of the event. Higher threat appraisal indicates decreased likelihood of maladaptive behavior. The threat appraisal has been applied in many health-related studies. The coping appraisal, which consists of response efficacy and self-efficacy, focuses on the adaptive responses. It determines the ability of a person to cope with a threat and take up steps to avoid.

PMT is applied mainly in health-related issues to study the behavior of people involved in smoking, drug abuse and alcoholism. Knowing the importance of PMT, most of the researchers have applied it in various fields. Following are some of the areas, where the PMT was applied and has proved to be effective.

- Promoting water conservation
- To study the behaviors related to the prevention of nuclear war
- The assertive behavior in interpersonal communications
- The problem of burglary by increasing precautionary measures with PMT
- Increasing earthquake preparedness.

PMT has been used as a framework for health education interventions designed to influence health behaviors. Enhancing healthy life-style, reduced alcoholic use, enhancing diagnostic health behaviors and preventing diseases are some of the studies undertaken by the researchers. Two meta-analyses have been done so far to analyze the research studies conducted on PMT.

The result of the first analysis (Floyd, 2000) analyzed 65 studies involving approximately 30000 participants, observed that coping appraisal variables and especially the sub-construct self-efficacy predicts protection motivation behavior very strongly. The other meta-analysis (Milne, 2002) which analyzed 27 studies involving 8000 participants concluded that both threat and coping appraisal variables were good predictors of intentions and/or behavior. In both the analyses self-efficacy had most consistent and strongest effect.

#### **Literature Review:**

**Adolescents' Smoking Behavior:** The researchers (Johanes Thrul, 2013) conducted a study to test the applicability of the threat appraisal and coping appraisal constructs in predicting smoking-related behavior of adolescents in Germany. A total of 494 non-smoking adolescents in the age group 11-16 were participated in the study. The study was longitudinal and conducted two times in a period of 75 days with the responses from the samples collected on Day 1 and Day 75. The analysis found that only coping appraisal has more influence on the behavior intentions compared to that of threat appraisal. Also PMT could be used only to predict the current behavioral intentions and not suitable for predicting future intentions. The researchers used the core constructs of PMT, namely, Threat appraisal and Coping appraisal in the study. The sub-constructs perceived severity, perceived vulnerability and rewards of maladaptive response to measure threat appraisal and self-efficacy, response-efficacy and response costs to measure coping appraisal. The resulting analysis showed that all the sub-constructs were not supportive of the theory, with self-efficacy showing strongest influence and perceived vulnerability indicating least influence. Based on the results of the analysis, the authors suggest that it would be more fruitful to enhance adolescents' self-efficacy to resist cigarettes by strengthening their refusal skills utilizing interactive intervention methods.

In spite of several prevention and intervention program in China, it was observed that the smoking habit among Chinese adolescents was very high. Authors (MacDonell, 2013), felt the control programs were not following the established theoretical principles. The authors had chosen to apply PMT for their study and see the effect. They had developed a culturally appropriate PMT scale for tobacco research in China. 553 Chinese first and second year vocational high school students were selected for this study with the assistance of government school authorities. A questionnaire containing 21 items, with 3 items for each of the 7 PMT sub-constructs on 7 point Likert scale, was finalized after reviewing by subject matter experts and revising. The results demonstrated the perceived threat and its two constructs negatively associated with intention to and the actual smoking behavior; perceived rewards and its two constructs were positively associated with the intention to and actual smoking. Higher self-efficacy and response efficacy were negatively associated with the smoking intention and smoking measures.

**Effect of Health Education:** A longitudinal study (Ghahremani, 2014) was conducted to analyze the effect of health education in preventing diseases like malaria. 144 households at Kerman, Iran, were chosen for the study. Demographic information, PMT constructs and checklists for prevention of malaria were included in the questionnaire. After the collection of data, a detailed educational program was conducted to the sample subjects on the prevention of malaria. Another test was conducted two months after the intervention program. Upon analysis of the post-test, the authors observed that there was significant improvement in the malaria preventive behaviors of the subjects after the educational intervention program based on PMT.

In their work (Charles S. Abraham, 1994), the HIV-preventive behavior of teenagers' was studied within the protection motivation theory framework. A confidential questionnaire was sent through postal means and 507 adolescent men and women responded. Using path analysis, the effect of demographic variables, previous sexual experience and appraisal of threat and coping resources upon HIV-relevant behaviors were investigated. Maladaptive and adaptive preventive behaviors were considered for analysis. Willingness to consider HIV antibody test, intention to limit number of sexual partners and expected condom use were considered as adaptive HIV-preventive behaviors. Coping appraisal measures were strongly associated with expected condom use but threat appraisal measures were not. Gender, previous sexual experience, coping appraisal measures and denial accounted for 33% of the variance in expected condom use. The results of this study were in accordance with PMT.

**Protection and Volitional Intentions:** In an innovative longitudinal study over a two week period, the researchers (Milne, 2002) enhanced the PMT with the implementation intentions theory. 248 participants were randomly allocated to a control group of one of two, motivational and volitional, intervention groups, respectively. It was found that the combined PMT and implementation intention intervention group had a powerful effect on subsequent exercise behavior.

The authors (Ying Zhang, 2012), conducted a longitudinal study combining motivational and volitional intervention to find the change in behaviors (exercise and diet) to minimize the risk of developing type 2 diabetes. 84 UK undergraduate students participated in this research study. The participants were grouped randomly into a control group or one of motivational intervention group, volitional intervention group or a combined motivational and volitional intervention group. PMT variables, exercise and dietary behaviors were measured at three time-points over a four-week period. Based on the analysis, the authors concluded that the PMT variables were significantly changed due to motivational intervention, the combined motivational and volitional intervention increased the

exercise frequency and reduced the intake of fat. It was also observed that the vegetable and fruit consumption significantly increased.

**Adherence Behavior:** The authors (Emma, 2008), explored the usefulness of PMT in predicting adherence behavior of patients in a general orthopedic rehabilitation facility and also the utility of a screening tool exclusively designed for predicting and understanding of adherence behavior. 229 (149 women and 80 men) patients who were above 18 years and registered in the rehabilitation and fitness facility and prescribed for 4 to 8 weeks of treatment were used as sample subjects. 75 patients of the study group discontinued treatment and dropped out. The authors observed that PMT provided support for adherence behavior in the specific setup and the screening tool was helpful in identifying patients who would likely to drop out.

**Study on Functional Food Consumption:** A functional food, which is otherwise said to be a processed food containing biological-active compound is suggested to be a better source in treating chronic disease in recent years. It is also stated by FFC, Functional Food Centre that the functional foods are effective, non-toxic and are clinically proven to provide health benefits for preventing, managing as well as treating the chronic diseases. These foods have gained considerable attention among the consumers towards maintaining health as well as wellbeing. For the study purpose, the authors (Oak-Heepark, 2011) have conducted an online survey, 465 participants from a South Western university were responded.

The main objectives of the study are to find a relationship among the components of Modified PMT (MPMT) and to identify or classify the consumers based on the functional food consumption. The MPMT model is based on the Rogers' (1983) model. The components of MPMT are threat appraisal and coping appraisal. Threat appraisal includes (i) severity: severity of health threats and (ii) vulnerability: perceived probability that health threats will occur. Coping appraisal includes (i) Response efficacy: perceived ability of a copying behavior i.e., consuming functional foods to remove the health threat and (ii) Self efficacy: ability of an individual to carry out the coping behavior i.e., actual consumption of functional foods. The main motive of designing MPMT was to assess the behavior of adult consumers' consuming functional foods. Hence, for an MPMT the inputs such as threat appraisal and coping appraisal were given. The outcome of this model was the intention component. As the intentions accurately predict the actual behavior, this component was used as an outcome of the model. Finally, Behavior was used as a final variable which was attenuated from the component intention.

To find whether the consumers were Health-Oriented or not, k-means clustering analysis was done. The clustering method classified the participants in to two groups. Cluster 1: Health oriented group. Out of 450 samples, 271 samples were classified under cluster1. The rest of the samples N=179 were considered to be an uninterested group. Though, the research had good objectives, it has got some limitations. The limitations includes the following (i) targeted participants for the study were only from Southwestern university (ii) The participants' age group were between 18 to 24 years, as this age group people have less health issues. (iii) The gender was not included for the study as majority: 74.9% of the participants were females. The authors have concluded that the aforesaid limitations will be addressed in their future research.

## 2. CONCLUSION

PMT has been widely used to predict a range of health-compromising and health-promoting behaviors. Smoking and alcoholic consumptions may be considered as examples of health-compromising behaviors; exercise and diet may be examples of health-promoting behaviors. Although, most of the studies provided significant support for all the PMT variables, self-efficacy turned out to be a strong predictor of intentions. The threat manipulation increased the likelihood of both adaptive and maladaptive coping responses, consistent with the idea that threat appraisal is a necessary, but not sufficient, condition for protection motivation. The coping appraisal manipulations were found to have significant effects on specific coping responses.

**Limitations and Future Work:** The review in this area of research is highly biased towards the data collected from western countries and the results do not reflect health behaviors of different cultures. Scholars can apply the concepts of PMT and MPMT and try to study the behavior of people in their region/country. Since many of the Indians do not continue the medication once they become slightly better, or we stop following a diet or exercise program, it is important make people realize and follow what is good for them. Application of PMT would definitely be effective.

## REFERENCES

Charles S. Abraham, Paschal Sheeran, Dominic Abrams & Russell Spears Exploring teenagers adaptive and maladaptive thinking in relation to the threat of HIV infection, *Psychology & Health*, 9 (4), 1994, 253-272.

Emma J, Grindley, Samuel J Zizzi, Alan M Nasypany, Use of Protection Motivation Theory, Affect, and Barriers to Understand and Predict Adherence to Outpatient Rehabilitation, *Physical Therapy*, 88 (12), 2008.

Floyd D L, Prentice-Dunn S Rogers R W, A meta-analysis of research on protection motivation theory, *Journal of Applied Social Psychology*, 30, 2000, 407-429.

Ghahremani L, Faryabi R, Kaveh MH, Effect of health education based protection motivation theory on malaria preventive behaviors in rural households of Kerman, Iran International Journal of Preventive Medicine, 5, 2014, 463-471.

Johanes Thrul, Adolescents' Protection Motivation and Smoking Behavior, Health Education Research, 28 (4), 2013, 683-691.

Lazarus R.S, Psychological stress and coping process, New York, McGraw Hill, 1966.

Leventhal H, Findings and theory in the study of fear Communications, In L. Berkowitz (ed) Advances in Experimental social psychology, New York, Academic press, 5, 1970, 119-186.

MacDonell K, Chen X, Yan Y, Li F, Gong J, Sun H, Li X and Stanton B, A protection motivation theory-based scale for tobacco research among Chinese youth, Journal of addiction research & therapy, 4, 2013,154.

Mark Conner, Cognitive Determinants of Health Behavior, Handbook of Behavioral Medicine Methods and Applications, (Ed) A Steptoe, 2010, 1040-1073.

Milne S, Orbell S and Sheeran P, Combining motivational and volitional interventions to promote exercise participation, Protection motivation theory and implementation intentions, British Journal of Health Psychology, 7, 2002, 163-184.

Milne S, Sheeran P, Orbell S, Prediction and intervention in health-related behavior, a meta-analytic review of protection motivation theory, Journal of Applied Social Psychology, 30, 2000, 106-143.

Oak-Heepark, Linda Hoover, Tim Dodd, Lynn Huffman, Du Feng, The Use of the Modified Protection Motivation Theory to Explore Adult Consumers, Functional Foods Consumption Behavior, Graduate Student Research Conference in Hospitality and Tourism, 2011.

Rogers R.W, A Protection Motivation Theory of fear appeals and attitude change, Journal of Psychology, 91 (1), 1975, 93-114.

Rogers R.W, Cognitive and physiological processes in fear-based attitude change, a revised theory of protection motivation, In J. Cacioppo & R. Petty (Eds.), Social psychophysiology, A source book, New York, NY, Guilford Press, 1983, 153-176.

Sutton S.R, Health Behavior, Psychosocial Theories, International Encyclopedia of Social & Behavioral Sciences, 2001, 6499-6506.

Ying Zhang and Richard Cooke, Using a Combined Motivational and Volitional Intervention to Promote Exercise and Healthy Dietary Behavior among undergraduates, Diabetes Research and Clinical Practice, 95 (2), 2012, 215-223.