Determination Factors of Patient's Acceptance of Nasal irrigation for Colds

— Review of —
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ABSTRACT

Nasal irrigation is a hygiene practice that reduces the backlog of mucus in patients for colds. However, nasal irrigation is still not widely used, despite its benefits and recommendation by medical professionals. The goal of this paper is to investigate factors that affect the acceptance behavior of nasal irrigation of patients who used self-medication for colds at select pharmacies in Bangkok. The subjects of this study were patients, both male and female aged 18 years old and over, who were residing in 50 districts in Bangkok. The multivariate logistic regression was used to investigate the influence of gender, age, education, occupation, monthly income, perceived benefit, perceived ease of use, belief, attitude, media influence, and personal influence toward the acceptance of nasal irrigation. The multiple logistic regression analysis showed that the result presented important variables such as education, perceived benefits, attitude, belief and personal influence had significantly influenced the acceptance of nasal irrigation for colds amongst select patients in Bangkok (p<0.05). Moreover, it is necessary for patients to understand the efficacy of nasal irrigation and recognise its benefits. By increasing knowledge, it was revealed that the attitude, belief, and perceived benefit about nasal irrigation will be increased leading to its acceptance.

Keyword: Respiratory diseases, Nasal irrigation, Acceptance, Patient, Bangkok

1. INTRODUCTION

Flu, which is a respiratory disease that occurs kind of frequently which is caused by nasal secretion, has become a more rampant health condition due to increased climate change (Papsin, T,2003; King, D., et al, 2015). Mucus, which often causes discomfort, is a major common problem in patients with diseases of the upper respiratory tract, such as common cold, rhinitis, sinusitis, and allergic rhinitis (Tomooka, L., et al, 2000). Another way to enhance the treatment more effectively is practiced by reducing the backlog of mucus in the nasal cavity which is the most common procedure in nose care or nasal irrigation (Pynnonen, M., et al.,2007; Rabago, D., et al.,2002).

Nasal irrigation is a procedure which inserts or drains a solution into the nose to flush the nasal mucus or pus in the nasal cavity out, making sticky mucus and viscous fluid to drain more easily (Brown, C., et al, 2004; Olson, D., et al, 2002). This is performed in order to clean the nose and to prevent the spread of germs from the nose and sinus cavity into the lungs, reducing the number of germs, allergens, and

waste substances from the reaction of the body (King, D., et al., 2015; Olson, D., et al., 2002). Clearing the nose with nasal irrigation products to reduce the backlog of mucus in patients for colds, is the way that doctors frequently recommend to treat colds. This hygiene practice is used instead of rubber suction which is generally primitive and is still widely available in pharmacy throughout the country. However, despite recommendations of medical professionals either otolaryngology or general practitioners and proven effectiveness reducing the backlog of mucus in the nasal cavity, nasal irrigation is still not widely used in Thailand today.

In this light, it is interesting to discover causal factors contributing to public acceptance for such treatment vis-a-vis more popular ways of self-medication for colds. The author deployed a model for health promotion taken from social learning theory which emphasized the importance of intelligence in order to help control behavior. The concept asserts that individuals would act to promote healthy activities continued into the pattern of life. Thus, this study aims to investigate factors that affect the acceptance behavior towards nasal irrigation of the patients who resort to self-medication in Bangkok.

The author expected that knowledge gained from this research could be applied to both the public health promotion to benefit the pharmaceutical industry and social campaigns on health. This will also allow the creation of innovative products which can meet the needs of patients with nasal mucus problems and to motivate to use nasal irrigation in cases of colds as well.

2. METHODOLOGY

Subjects of this study were males and females aged 18 years old and over, patients who visited drugstores and were residing in Bangkok. This study was conducted in Bangkok to achieve the representation of the population in Thai capital. The sampling design was employed with the multi stratification thus the questionnaires were distributed to 50 districts in Bangkok. Two drugstores per district (50 districts) were first chosen via probability sampling and data were gathered from 15 persons for each drug store. The respondents were selected by using accidental sampling. Oral informed consent was requested before continuing the interview. Altogether, this study involved the complete questionnaires involving 1,460 respondents.

Theory of Health Promotion Model (Pender, 1987) was implemented to analyze the phenomena of the acceptance of nasal irrigation. The concept asserts that individuals would act to promote healthy activities as well as activities continued into the patterns of life. As a result of the influence of the three cognitive perceptual factors, demographic factors, and cues actions via personal interactions and media are key to addressing this issue. Moreover, independent variables include socio-demographic characteristic (namely gender, age, education, occupation, and monthly income), perceived benefits, perceived ease of use, belief, attitude, media influence, personal influence. Respondents opinions on perceived benefit (PB), perceived ease of use (PEOU), belief, attitude, media influence, and personal influence were measured by using scale of 1 to 5, with 5 representing strongly agree and 1 representing strongly disagree.

Perceived benefit refers to the belief a better understanding of the results that were obtained when using nasal irrigation. This element has 15 questions in the questionnaire. Perceived ease of use refers to the perception of one on the level of

difficulty of a products usage. It also pertains to the ability to act and behave in a condition that could be controlled to achieve the intended results. This element has 6 questions found in the questionnaire.

Attitudes toward the behavior refer to the assessment of the positive or negative action and one's perspective or foresight of an expected result. The questionnaire has 5 questions on this matter.

Media influence and personal influence refer to the gained knowledge and understanding about nasal irrigation brought about by various forms of media and personal interaction. The questionnaire has 10 questions on this matter.

The dependent variable was the acceptance of nasal irrigation, therefore the respondent's acceptance was coded as 1 for acceptance of nasal irrigation and 0 otherwise.

Collected data were fitted into STATA (Version 14). Descriptive and inferential statistics were employed to achieve the research objectives. Descriptive statistics, which includes percentage, mean, and standard deviation, was used to describe the respondent's characteristics. The multivariate logistic regression to investigate factors such as gender, age, education, occupation, monthly income, perceived benefit, perceived ease of use, belief, attitude, media influence, and personal influence was key to knowing more about acceptance of nasal irrigation. This study developed three logistic models. Since the acceptance of the nasal irrigation was measured via the scale of 0 and 1, so the appropriate statistical method to fit the model was multiple logistic regressions.

The first model analyzed the influence of gender, age, education, occupation, and monthly income towards acceptance of nasal irrigation. The second model analyzed the effects of gender, age, education, occupation, monthly income, perceived benefit, perceived ease of use, belief, attitude towards acceptance of nasal irrigation. While the last model analyzed gender, age, education, occupation, monthly income, perceived benefit, perceived ease of use, belief, attitude, media influence, and personal influence towards the acceptance of nasal irrigation. The hypothesis testing was then conducted on acceptance levels regarding nasal irrigation. The 5% significance level was applied to consider null hypothesis rejection.

3. RESULTS

3.1 Sample characteristics

The results of the data analysis, as shown in Table 1, were presented in such a way to highlight the background variables of respondents, testing of the hypotheses of the study and findings. The age sample include females (52.12%) and males (47.88%); most of the respondents were aged 25-30 years. Most of the respondents were bachelor degree educated (38.08%), followed by those who received vocational certification (32.67%). The least of the respondents had a Master's degree or higher (6.71%). Occupation of respondents include private officials (43.97%) followed by government officers (17.81%), business owners (15.82%), and student (15.34%).

Table 1: Characteristics of the sample, by the acceptance of nasal irrigation (n = 1,460)

Demographic factor	Yes (%)	No (%)	Total
Gender			
Male	49.16	50.84	699
Female	50.84	49.16	761
Age			
18-24 years old	14.41	85.59	250
25-30 years old	21.93	78.07	334
31-35 years old	21.1	78.9	316
36-40 years old	18.77	81.23	265
41-45 years old	13.57	86.43	168
More than 45 years old	10.22	89.78	127
Education			
Primary school	5.76	94.24	120
High school	12.73	87.27	209
Vocational certificate	28.9	71.1	477
Bachelor degree	43.96	56.04	556
Master degree or higher	8.64	91.36	98
Occupation			
Government officer	16.08	83.92	260
Housewife	6.13	93.87	103
Private officer	48.79	51.21	642
Business owner	16.64	83.36	231
Student	12.36	87.64	224

Table 1: Characteristics of the sample, by the acceptance of nasal irrigation (n = 1,460)
(continued)

Demographic factor	Yes (%)	No (%)	Total
Monthly Income			
Less than 10,000 Baht	12.08	87.92	302
10,000-20,000 Baht	32.62	67.38	521
20,000-30,000 Baht	31.13	68.87	368
30,001-40,000 Baht	14.96	85.04	166
More than 40,000 Baht	9.2	90.8	7
Total			**1,460**

The acceptance of nasal irrigation was classified via socio-demographic indicators as shown in Table 1. Males and females had the same proportion (49.16% and 50.84% respectively). Furthermore, it was found that among those who accepted

nasal irrigation were mostly aged 25-30 years old (21.93%), those with bachelor's degree (43.96%), private officer (48.79%). Moreover, most of the respondents who accepted nasal irrigation had a monthly income of 10,000-20,000 Baht (31.13%).

3.2 Factors related to the acceptance of nasal irrigation

The author used multiple logistic regression in order to test the research hypothesis This pertains to the likelihood of the respondent's acceptance of nasal irrigation was related to gender, age, education, occupation, monthly income, perceived benefit, perceived ease of use, attitude, belief, media influence, and personal influence on the acceptance of nasal irrigation.

Table 2: Odd Ratios for relationships between factors related to the acceptance of nasal irrigation (n=1,460)

Factors	Odds Ratio (95%Coef.Interval)					
	Model 1		Model 2		Model 3	
Gender (Reference : Male)						
Female	0.884	(0.671-1.164)	1.036	(0.657-1.635)	1.090	(0.686-1.727)
Age (Reference 18-24 year)						
25-30	1.019	(0.689-1.507)	8.878	(0.454-1.737)	0.890	(0.453-1.749)
31-35	0.690	(0.452-1.053)	7.878	(0.381-1.628)	0.721	(0.347-1.495)
36-40	0.621	(0.385-1.003)	6.614	(0.293-1.491)	0.620	(0.271-1.415)
41-45	0.989	(0.519-1.888)	1.445	(0.541-3.860)	1.443	(0.542-3.837)
>45	1.208	(0.595-2.454)	5.429	(0.203-1.455)	0.532	(0.199-1.419)

Table 2: Odd Ratios for relationships between factors related to the acceptance of nasal irrigation (n=1,460)
(continued)

Factors	Odds Ratio (95%Coef.Interval)					
	Model 1		Model 2		Model 3	
Education (Reference : Primary school)						
High school	1.403	(0.840-2.344)	1.812	(0.780-4.210)	1.842	(0.795-4.269)
Vocational certificate	0.659	(0.396-1.097)	1.604	(0.676-3.804)	1.549	(0.653-3.675)
Bachelor degree	1.105	(0.621-1.965)	2.214	(0.826-5.934)	2.448*	(0.911-6.577)
Master degree or over	2.511	(0.821-7.685)	2.361	(0.506-11.007)	3.371	(0.699-16.262)
Occupation (Reference : Government officer)						
Housewife	1.697	(0.964-2.989)	1.787	(0.669-4.774)	1.963	(0.717-5.378)
Private officer	1.617*	(1.117-2.342)	1.310	(0.707-2.427)	1.496	(0.795-2.814)
Business	1.482	(0.941-2.334)	1.553	(0.724-3.331)	1.689	(0.781-3.653)

owner						
Student	0.808	(0.528-1.235)	9.050	(0.414-1.980)	0.882	(0.396-1.962)
Monthly income (Reference :<10,000 baht)						
10,000-20,000	3.364*	(2.274-4.975)	1.135	(0.556-2.318)	1.140	(0.546-2.379)
20,000-30,000	16.843*	(9.758-29.071)	1.821	(0.756-4.387)	1.795	(0.722-4.467)
30,001-40,000	46.128*	(16.303-130.517)	2.471	(0.622-9.817)	2.247	(0.559-9.031)
>40,000	18.292*	(5.416-61.783)	1.114	(0.220-5.647)	1.183	(0.233-6.018)
Perceived benefit			1.299	(4.274-39.455)	11.769*	(3.837-36.100)
Perceived Ease of Use			7.385	(0.248-2.202)	0.901	(0.302-2.693)
Attitude			1.434	(4.948-41.547)	11.318*	(3.802-33.687)
Belief			3.730	(0.246-0.567)	0.271*	(0.166-0.441)
Media Influence					1.113	(1.217-3.867)
Personal Influence					2.178*	(1.217-3.897)
_cons	0.669		1.330		1.458	
Pseudo R2	0.217		0.652		0.657	
Prob>Chi2	0.000		0.000		0.000	

* Significant at the 0.05 level

The first model presented the influence of socio-demographic factors towards the acceptance of nasal irrigation. The multivariate logistic regression results show that occupation and monthly income significantly affect one's acceptance of nasal irrigation. Moreover, in terms of occupation, those working in private firms are 1.617 times more likely to accept the nasal irrigation as compared to government officers. It is also interesting to note that monthly income can positively influence the acceptance of nasal irrigation. The odds ratios showed the higher monthly income is the more likely acceptance to nasal irrigation can occur.

Early adopters of new technology in this study showed that the early adopter of nasal irrigation tended to have higher educational level than those who received lower education types of education. It can be asserted that they can easily understand the weakness and the advantage of new methods of addressing colds. Similar to a research on new system acceptance, those with lower education tend have lower probabilities of acceptance (Porter, C.E. And N. Donthu, 2006). One has to realise that accepting a new medication method is not an easy decision. It requires good understanding about the benefits and costs of the new form of medicine. Accordingly, decision making needs increased knowledge and better education.

The second model revealed the relationship amongst socio-demographic factor, the perceived of benefit, perceived ease of use, attitude, and belief toward the acceptance of nasal irrigation. By including others variables, the author was able to investigate them by controlling socio-demographic factors. Statistical results reveal that none of the perceived of benefit, perceived ease of use, attitude, and belief had

significant influence toward the acceptance of nasal irrigation. This study does not agree with the basic concept of Technological Acceptance Model which explained that the perceived of benefit, perceived ease of use and attitude influenced the acceptance of technology (Davis, F.D., 1989).

The third model involved the second model with the addition of the impact of media influence and personal influence towards the acceptance of nasal irrigation. The result exhibited that education, perceived of benefit, attitude, belief, and personal influence significantly to the nasal irrigation acceptance. It is interesting to note that personal influence seemed to be more convincing that media influence. The higher score of personal influence impacted two times more compared to the lower media influence score. Moreover, the third model articulated that the higher level of perceived of benefits and the higher level of attitude affected 11 times more in relation to nasal irrigation acceptance.

Comparing the second model and the third models, it was clear that personal influence had important influence on the relationship between the perceived of benefit, attitude, and belief towards the acceptance of nasal irrigation. This faction can be considered as a moderator independent and dependent variables. The third model articulated that the independent variable contributes to 65.7% for the acceptance of nasal irrigation. This finding confirmed the empirical facts also show that perceived benefit (PB) and perceived ease of use (PEOU) do not directly contribute to the acceptance of nasal irrigation in Model 2. After the author added the personal influence and the media influence into Model 3, it was found that personal influence showed significant effect on the acceptance of nasal irrigation including changes in the impact of perceived benefit (PB) toward the acceptance of nasal irrigation. Moreover, perceived benefit (PB) can be associated to the acceptance of a person against a new technology adoption (Ndubisi, O.N.,2005).

4. DISCUSSION AND CONCLUSION

Results from the survey reveal that factors such as gender, age, occupation, monthly income, and perceived ease of use do not directly affect one's acceptance of nasal irrigation as treatment for colds in Bangkok.

Results also presented important variables that had significant influence on the level of acceptance of nasal irrigation in Bangkok, Thailand. These were education, perceived benefit, attitude, belief, and personal influence. Those who attained bachelor's degree had highest proportion of acceptance of nasal irrigation compared to the others. It has to be stressed that higher educated people, who are also more likely to be employed, have a higher monthly income, have higher level of social support, could have higher chances of accepting nasal irrigation (Loucks, E.B.,2012; Loucks, E.B,2011). According to the study of Shkolnikov and others (Shkolnikov, V.M., et al., 1998), education might leverage an individual social status and quality of life which allows one to have better options for health service utilization. Moreover, some reports showed the benefit of joint investments in education and health. Indeed, those with better education and health usually had a high standard of living (Amaducci, L., et al., 1998).

With regards to perceived benefit and attitude analysis, those with high levels of both could 11 times be more likely to accept nasal irrigation. According to theories of health behavior such as Social Cognitive Theory and the Theory of Reasoned Action, one's knowledge and attitudes can directly attribute to one's health behavior

(Avis NE, et al., 1989). Many studies found that health information could facilitate awareness about benefits of healthy practices (Pearson, T., et al., 2003).

Several studies have also explained the positive influence of information on health practice. For example, one study found that more people resorted to hearing aids when they received knowledge about how to use hearing aids and its benefits (Khan, M., et al., 2007). A person need to understand and be convinced by the benefits in order to subscribe to a new behavior. Still there are barriers that hinder one's transformation of behavior, such as difficulty to adopt to patterns of behavior, developing a new habit, fear of not being able to perform the practice correctly, or being embarrassed to try out a new practice of product.

It is key to stress that personal influence has an important role is accepting nasal irrigation. There were many articles and studies that support the strong relationship between surrounding environments and health behavior which provide further impetus to act as external factors for individual or group of people to influence them in accepting or not accepting of nasal irrigation in Bangkok, Thailand. The study conducted by Kuang-Ming and others (Kuang-Ming, K., et al., 2013) found out nurses can greatly influence one's personal decision and attitude.

Therefore, In order to achieve the acceptance of nasal irrigation, it is necessary to understand and recognise efficacy of nasal irrigation for the patients, and to also look into the factors that may affect one's decision and attitudes (Randike, G. And S. Tony, 2013). Information about nasal irrigation should be made well known in order to improve social and personal knowledge on the matter. At the end of the way, by increasing knowledge, attitudes, belief systems and perceived benefits towards acceptance of nasal irrigation will also be changed.

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