

Available online at www.sciencedirect.com**ScienceDirect**

Procedia - Social and Behavioral Sciences 127 (2014) 358 – 362

Procedia
Social and Behavioral Sciences

PSIWORLD 2013

Gender variations in the psychological factors as defined by the extended health belief model of oral hygiene behaviors

Liviu Zetu^a, Irina Zetu^a, Carmen Beatrice Dogaru^b, Carmen Duță^b, Alexandrina L. Dumitrescu^{c*}

^aUniversity of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania

^bUniversity of Medicine and Pharmacy "Carol Davila", Bucharest, Romania ^cPrivate practice, Bucharest, Romania

Abstract

Oral self-care practice is an effective preventive measure for maintaining good individual oral health which is an integral part of one's general health. The aim of this analysis was to investigate gender variations in the psychological factors as defined by the extended health belief model (HBM) and oral hygiene behaviors (OHB). Females reported higher values on perceived severity and self-efficacy and lower values on perceived barriers. Exploratory regression analyses revealed that for males perceived barriers and self-efficacy were relatively important determinant of OHB, whereas among females only self-efficacy was relevant. Gender variations in OHB and in the psychological determinants should be considered when designing practical recommendations for improving OHB.

© 2014 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of Romanian Society of Applied Experimental Psychology.

Keywords: health belief model; severity; susceptibility; benefits; barriers; oral health behaviors

1. Introduction

Over the last decades much research has been devoted to the analysis of psychosocial factors associated with the development of health problems (Bermúdez, 1999). A number of theoretical models of individual self-protective

* Corresponding author. Tel.: +40 722 352 504.

E-mail address: alexandrina_l_dumitrescu@yahoo.co.uk

behavior have been formulated: the Health Belief Model (HBM) (Becker, Drachman, & Kirscht, 1974; Rosenstock, 1974), the Protection Motivation Theory (PMT) (Maddux and Rogers, 1983), the Precaution Adoption Process (PAPM) (Weinstein, 1993), the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (TPB), the Subjective Expected Utility Theory (SEUT) (Edwards, 1954), and the Comprehensive Health Seeking and Coping Paradigm (CHSCP) (Nyamathi, 1989).

The Health Belief Model, considered to be one of the most influential models in health promotion, originated in the 1950s (Hochbaum, 1958) and was extended, at a later stage, to include screening behaviors, all preventive health actions and illness behaviors (Becker et al., 1974; Rosenstock, 1974; Maiman, Becker, Kirscht, Haefner, & Drachman, 1977). The evidence available indicates that the HBM has most frequently been employed in the context of health service uptake issues such health promotion and compliance with medical/dental treatment (Ersin & Bahar, 2011; Kiviniemi, Bennett, Zaiter, & Marshall, 2011; Umaki, Umaki, & Cobb, 2010; Buglar, White, & Robinson, 2010).

The significant constructs in the HBM are: 1) “Perceived susceptibility”: subjective perception of the risk of contracting an illness; 2) “Perceived severity”: feelings about the medical and social consequences of acquiring a disease; 3) “Perceived benefits”: referring to the effectiveness of the particular activities in reducing the threat of disease/illness; 4) “Perceived barriers”: the cost-benefit analysis that people undertake to weigh up a beneficial action and its opposing limitations (e.g. costs, time inconvenience); 5) “Cues to action”: the perception of barriers and the levels of susceptibility and severity offer a preferred mode of action and provide the stimulus to act; 6) “Modifying factors”: demographic, socio-psychological and structural factors which affect the individual’s perceptions about perceived benefits of preventive health actions (Roden, 2004).

Many previous studies showed clear gender differences in the percentages of adults reporting oral health practices (Pakpour & Sniehotta 2012; Al-Omiri, Barghout, Shaweesh, & Malkawi, 2012; Guiney, Woods, Whelton, & Morgan, 2011). The aim of this analysis was to investigate gender differences in the psychological factors as defined by the Health Belief Model (HBM) applied to oral hygiene behavior (OHB).

2. Material and methods

2.1. Sample

The participants of this descriptive, correlational, cross-sectional study were 288 first-year undergraduate students at the Faculty of General Medicine, University of Medicine and Pharmacy “Carol Davila”, Bucharest, who were invited to participate in this survey at the end of the 2011-2012 academic year. In addition, the sample was ethnically homogeneous (100% whites). Upon entry, all participants gave written informed consent for their participation. The study was conducted in full accordance with established ethical principles (World Medical Association Declaration of Helsinki, version VI, 2002).

2.2. Instruments and measures

The research data were gathered by using a structured questionnaire in Romanian. The questionnaire consisted of 85 items and was constructed based on the health belief model (HBM) and self-efficacy (Maiman et al., 1997; Buglar et al., 2010) constructs for each personal (toothbrushing, flossing, mouthwashes) and professional (frequency and reason of dental visits) oral health behavior. It examined the effect of the theory’s constructs on intention to improve oral health behaviors. All variables were scored consistently so that higher mean scores reflected more-positive attitude, more-positive subjective norm, and higher perceived behavioral control towards oral health behaviors. The overall alpha coefficient of the instrument was 0.95.

2.3. Statistical analysis

Descriptive statistics and statistical analyses were performed with computerized statistical package (SPSS 17.0, Inc., Chicago, USA) software. The internal consistency of the scale was examined using Cronbach's alpha. Descriptive statistics were used on all variables. Differences between groups were identified with Student's *t*-test

and correlations were performed using Pearson coefficient. Multiple linear regression analyses were performed utilizing perceived severity, perceived susceptibility, perceived benefits, perceived barriers and self-efficacy as independent variables in the study group. All reported *P*-values are two-tailed; moreover, those *P*-values less than 0.05 were considered statistically significant.

3. Results

3.1. Differences of the HBM variables according to gender

No significant gender differences were found when oral health behaviors were compared: 52.96% of females said they brushed each of their teeth twice or more than twice per day compared with 50.70% of the males ($P > 0.05$); 30.92% of females flossed daily compared with 28% of the males ($P > 0.05$); 41.67% of females visited their dentist less than 6 months ago compared with 42.25% 19.72% of the males ($P > 0.05$). Regarding the reasons for dental visiting, 56.34% of males compared with 51.2% of the females agreed that they had visited their dentist for dental treatment and when pain and not for regular check-ups or for dental cleaning ($P > 0.05$).

However, significant interaction effects between gender and the potential determinants on OHB were found (Table 1). Females reported higher values on perceived severity ($P < 0.05$), and self-efficacy ($P < 0.05$) and lower values on perceived barriers ($P = 0.001$). No significant differences were observed related to perceived susceptibility and perceived benefits constructs among males and females ($P > 0.05$).

Table 1. Means and standard deviations (SDs) of TPB variables in the model predicting intention to improve oral health behaviors

HBM Variables	Males	Females	<i>P</i>
Perceived severity	2.89 ± 1.01	3.34 ± 1.04	<0.05
Perceived susceptibility	3.08 ± 1.14	3.36 ± 1.01	NS
Perceived barriers	2.14 ± 0.78	1.83 ± 0.63	0.001
Perceived benefits	3.69 ± 0.90	3.90 ± 0.87	NS
Self-efficacy	3.26 ± 0.98	3.58 ± 0.88	<0.05

3.2. Intercorrelations of HBM variables in males and females

In both groups, oral health behaviors were significantly positively correlated with self-efficacy (males: $r = 0.42$, $P < 0.01$; females: $r = 0.36$, $P < 0.01$). However, in females oral health behaviors were also correlated with perceived severity ($r = 0.20$, $P < 0.01$) and perceived susceptibility ($r = 0.26$, $P < 0.01$). The other components of the model were also significantly correlated with each other (Table 2).

3.3. Multiple regression analyses

Exploratory regression analyses revealed only a few variations in predictors of oral health behaviors between males and females, in that for males perceived barriers ($P = 0.05$) and self-efficacy ($P < 0.05$) were relatively important determinant of oral health behaviors ($P < 0.05$), whereas among females only self-efficacy ($P < 0.05$) was relevant ($P < 0.0001$) (Table 3).

Table 2. Intercorrelations among HBM variables in the model predicting oral health behaviors (Males are in the lower left area; females in the upper right area) (*: $P < 0.05$; **: $P < 0.001$)

HBM Variables	B	SV	SC	BR	BF	SE
Oral health Behavior (B)	1	0.20*	0.26**	-0.05	0.03	0.36**
Perceived severity (SV)	0.15	1	0.81**	-0.02	0.66**	0.44**
Perceived susceptibility (SC)	0.16	0.77**	1	-0.04	0.62**	0.45**
Perceived barriers (BR)	-0.14	-0.24	-0.18	1	-0.22**	-0.39**
Perceived benefits (BF)	0.026	0.77**	0.62**	-0.37**	1	0.53**
Self-efficacy (SE)	0.42**	0.57**	0.52**	-0.37*	0.44**	1

Table 3. Multiple regression analyses of predictors of oral health behaviors according to the Health Belief Model (*: $P < 0.05$)

HBM Variables	Males	Females
Perceived severity	-0.28	-0.16
Perceived susceptibility	0.04	0.18
Perceived barriers	-0.31*	-0.09
Perceived benefits	0.14	0.18
Self-efficacy	0.39*	0.21*
r^2	0.29	0.17
F	2.97	5.68
P	<0.0001	<0.0001

4. Discussion

Human behavioral science has developed studies on health behavior since more than sixty years ago. Oral health behavior consists of individual and professional care, and includes toothbrushing, dental flossing, using mouthwashes and visiting a dentist. The Oral self-care practice is an effective preventive measure for maintaining good individual oral health which is an integral part of one's general health. His main aim is to remove dental plaque, the essential determinant of dental decays, gum and periodontal disease.

Several previous studies (Ostberg, Halling, & Lindblad, 1999; Nanakorn et al., 1999) have showed major differences between oral health behaviors in male and female students: females possesses a greater interest in oral health, engage in better oral hygiene behavior oral measures, visited their dentists and brushed their teeth more often than males. In this study were not significant differences between males and females with regard to toothbrushing and flossing frequency, mouth rinsing or dental visits (reason for visit or frequency). Oral health behavior may be determined during childhood, and may be well developed in young persons who have decided to follow medical and dental sciences. They would thus be more concerned about their oral health, visiting the dentist and would tend to be more educated about their dentition even before entering to the undergraduate studies. Hence, we found that females reported higher values on perceived severity and self-efficacy and lower values on perceived barriers regarding oral health behaviors, most probably to their concern in body appearance.

Exploratory regression analyses revealed, in both males and females, self-efficacy as predictor of oral health behaviors. This is not surprising as self-efficacy, or judgment about ability to perform certain behaviors, is an important basis for action: persons with a high sense of efficacy tend to set higher goals, persist longer at tasks despite obstacles, and devote more effort and energy to the task compared to those without a strong sense of efficacy (Bandura & Locke, 2003).

Self-efficacy should be considered when designing practical recommendations for improving oral health behaviors (Stretcher, DeVellis, Becker, & Rosenstock, 1986). Once the dentist has identified the patient's self-motivation for changing the oral health behavior(s), the changes that need to be made will be explored and subtly encouraged. The dentist will affirm the patient's competence, encourage additional self-motivational statements and

also encourage the patient to talk about the difficulties in changing the oral habits and explore possible solutions. There is a need of further experimental research in this area for the development of tailored oral hygiene interventions.

References

- Becker, M.H., Drachman, R.H., & Kirscht, J.P. (1974). A new approach to explaining sick-role behavior in low-income populations. *American journal of public health*, 64, 205–216.
- Bermúdez, J. (1999). Personality and health-protective behaviour. *European journal of personality*, 13, 83-103.
- Buglar, M.E., White, K.M., & Robinson, N.G. (2010) The role of self-efficacy in dental patients' brushing and flossing: testing an extended Health Belief Model. *Patient counselling and health education*, 78(2), 269-72.
- Edwards, W. (1954). The theory of decision making. *Psychological Bulletin*, 51, 380-417.
- Ersin, F., Bahar, Z. (2011). Effect of health belief model and health promotion model on breast cancer early diagnosis behavior: a systematic review. *Asian Pacific journal of cancer prevention*, 12(10), 2555-2562.
- Fishbein, M., & Ajzen, I. (1975). *Belief; Attitude; Intention and Behavior, An Introduction to Theory and Research*. Menlo Park; CA, Addison-Wesley.
- Hochbaum, GM. (1958). *Public participation in medical screening programs: A socio-psychological study* (PHS Publication No. 572). Washington DC, US Government Printing Office.
- Maddux, J., & Rogers, R. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of experimental social psychology*, 19, 469-479.
- Maiman, L.A., Becker, M.H., Kirscht, J.P., Haefner, D.P., & Drachman, R.H. (1977). Scales for measuring health belief model dimensions: a test of predictive value; internal consistency; and relationships among beliefs. *Health education monographs*, 5, 215–230.
- Nanakorn, S., Osaka, R., Chusilp, K., Tsuda, A., Maskasame, S., & Ratanasiri, A. (1999) Gender differences in health-related practices among university students in northeast Thailand. *Asia-Pacific journal of public health*, 11(1), 10-15.
- Nyamathi, A.M. (1989). Comprehensive health seeking and coping paradigm. *Journal of advanced nursing*, 14, 281–290.
- Ostberg, A.L., Halling, A., & Lindblad, U. (1999) Gender differences in Knowledge, attitude, behavior and perceived oral health among adolescents. *Acta odontologica Scandinavica*, 57, 231-6.
- Roden, J. (2004). Revisiting the Health Belief Model: Nurses applying it to young families and their health promotion needs. *Nursing and health sciences*, 6, 1–10.
- Rosenstock, I.M. (1974). The Health Belief Model and preventive health behavior. *Health education monographs*, 2, 354–386.
- Umaki, T.M., Umaki, M.R., & Cobb, C.M. (2012). The psychology of patient compliance: a focused review of the literature. *Journal of periodontology*, 83(4), 395-400.
- Weinstein, N.D. (1988). The precaution adoption process. *Health Psychology*, 7, 355-86.