Testing of Uncertainty in Illness Theory to predict quality of life among Thais with head and neck cancer

Mukda Detprapon, Yupapin Sirapo-ngam, Merle H. Mishel, Yajai Sitthimongkol, Thavatchai Vorapongsathorn

Abstract: This cross-sectional descriptive study tested the Uncertainty in Illness Theory to determine factors influencing quality of life among Thais with head and neck cancer. The selected variables were symptom experience, Buddhist practices, uncertainty, depression, and QOL. A sample of 240 head and neck cancer patients was recruited from five hospitals in Bangkok. The instruments included a: Set Test; Demographic Questionnaire; Modified Symptom Experience Scale; Buddhist Practices Scale; Community version of Mishel's Uncertainty in Illness Scale; Center for Epidemiologic Studies Depression Scale; and, Version 4 of the Functional Assessment of Cancer Therapy - General Scale. The hypothesized model was tested using LISREL 8.52.

The model fit the empirical data and explained the majority of the variance in uncertainty, depression and quality of life among the subjects. Symptom experience had a positive impact directly on uncertainty and indirectly on depression and QOL, mediated through uncertainty. On the other hand, uncertainty had a negative impact on quality of life, but a positive impact on depression. Buddhist practices had a positive, although non-significant, impact on QOL, but did not have an indirect effect either on uncertainty through symptom experience or on depression and QOL through uncertainty. These findings may help in managing symptom experience and uncertainty, contribute to preventing and reducing depression, and enhance QOL in patients with head and neck cancer.

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Background and Rationale of the Study

Head and neck cancer (HNC) impacts one's quality of life (QOL) given that it involves the skin, soft tissue and/or bones of the head and neck region, a readily visible, prominent, identifiable area of the body which serves as the fundamental medium for communication with others.[1] QOL refers to one's

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appraisal of satisfaction with his/her current level of functioning, as compared to what the person perceives to be possible or ideal.[2] General treatment for HNC, i.e. surgery, radiation therapy and chemotherapy, administered alone or in combination, may result in one experiencing head and neck dysfunction, disfigurement and psychosocial problems.[3] Individuals with HNC often try to distance themselves from engaging in social activities, socially withdraw, experience low self-esteem and develop depression.[4]

Ongoing symptoms, resulting from the disease and treatments, may contribute to experiencing "uncertainty" or not being able to determine the meaning of illness-related events. Such uncertainty may be created when a person is unable to adequately structure or categorize events because of insufficient cues.[5] The diversity and unpredictability of symptoms, such as fatigue, often lead to one experiencing uncertainty, since he/she may not know the cause of the symptoms or how to effectively manage them.

Moreover, lack of information about the disease process and treatment can create uncertainty, i.e. someone undergoing radiation therapy may experience taste changes and/or loss of appetite. Even though either can return to normal after treatment is completed, patients often do not know the trajectory of the changes or how long it will take to regain taste and /or appetite after treatment. Thus, symptom severity and distress, from illness or treatment, may increase uncertainty among individuals with HNC. Furthermore, the side effects and long-term financial consequences of treatments, as well as traveling expenditures to/from home/hospital, are unpredictable and unknown.

Patients often rely on religious beliefs to help them deal with uncertainty, as well as cope with painful events.[6] In Thailand, over 90% of the population are Buddhist.[7] Despite different cultural interpretations of Buddhism,[8] core teachings of Buddhism deal directly with the concept of suffering and how to eliminate it. In addition, the practice of Buddhism has been found to impact depression and QOL.[6-7]

Although studies regarding one's QOL and level of depression have been conducted in Western countries,[9-10] there has been limited investigation, in Thailand, of these concepts among individuals with HNC. Given that culture is a major determinant of QOL,[11] and Western cultures are different from the Thai culture, one effectively cannot generalize QOL for Thai people from findings conducted among Western individuals. Thus, it is essential to investigate QOL and its associated factors, as perceived by Thais with HNC, when seeking to determine the effect HNC has on Thai's QOL.

Conceptual Framework

The Uncertainty in Illness Theory (UIT), in combination with the concept, "religious participation as a structure provider,"[12] comprised the theoretical framework for this study. The UIT is organized around three major themes: antecedents of uncertainty; appraisal of uncertainty; and, coping with uncertainty. Uncertainty is the central concept in the theory and is defined as the inability to determine the meaning of illness-related events occurring when the decision maker is unable to assign definitive values to objects or events, and/or is unable to accurately predict outcomes.[13] Uncertainty is a major component of all illness experiences which affect outcomes of disease,[14] and is a fluctuating experience that never totally resolves in cancer patients. Previous studies show that uncertainty has been related to poorer QOL.[15]

The primary antecedent of uncertainty is the stimuli frame, which has three components: symptom pattern; event familiarity; and, event congruence between the expected experience and the actual experience.[5] Uncertainty is reduced when patterns among symptoms and events can be detected, and when illness events can be predicted. Cognitive capacity and structure providers positively influence the three components of the stimuli frame. When patients have

impaired cognition, ability to interpret and predict symptoms and events is lessened. Structure providers are resources available to assist one in the interpretation of the stimuli frame and can reduce uncertainty directly and indirectly.[5] In regard to the adaptation outcome of the UIT, adaptation refers to returning one to a pre-illness level of functioning, which can be both positive and negative outcomes.[16] In this study, QOL and depression refer to the positive and negative outcomes, respectively.

Symptom experience, in this study, is noted as a cause of uncertainty,[13] which consists of symptom severity and symptom distress from illness or treatment. Previous findings reveal that symptom severity and distress influence uncertainty in individuals with acute and chronic illnesses.[17] Symptom experience may increase uncertainty in patients with HNC due to: unfamiliar symptoms, unpredictability of symptoms, and lack of information on how to manage existing uncertainty.

Buddhist practices promote positive attitudes that contribute to positive hope, a way to reinterpret negative thought processes. This contributes to reducing depression and, subsequently, increasing QOL.[4] Buddhism is a system of teachings about ridding life of its ultimate problem of mental suffering.[18] If patients have a belief of receiving good results from Buddhist practices, they will participate more frequently when encountering troubles, i.e. illness, in life. These practices may help development of a peaceful mind and facing life difficulties.[19] Buddhist practices, in this study, act as the structure provider to help one interpret stressful events to directly reduce uncertainty, and indirectly alter stimuli frame variables (symptom experiences) by interpreting, providing meaning and explaining events.[5] Common symptom experiences include: loss of normal facial appearance; speech; communication; taste; and, smell.[4]

To date, no study has investigated the relationship among symptom experience, Buddhist practices, uncertainty, depression and QOL among Thais with HNC. Therefore, this study was conducted to examine the UIT as a framework for predicting QOL among Thais patients with HNC. The following five research hypotheses were tested using Thais with HNC: (1) symptom experience has a direct positive impact on uncertainty, and an indirect impact on QOL and depression, mediated through uncertainty; (2) Buddhist practices have a direct negative impact on symptom experience and uncertainty, or an indirect impact on uncertainty, mediated through symptom experience; (3) Buddhist practices have a direct positive impact on QOL, or an indirect impact, mediated through uncertainty; (4) Buddhist practices have a direct negative impact on depression, or an indirect impact, mediated through uncertainty; and (5) uncertainty has a direct positive impact on depression, and a direct negative impact on QOL.

Method

A correlational, cross-sectional design was conducted using a convenience sample of 240 Thai Buddhists diagnosed with HNC. Inclusion criteria were individuals: 18 years of age or older; without history of disease which might affect their cognitive ability; able to communicate in Thai; finished with at least one month, but no more than one year, of treatment; coming for follow-up treatment at an otolaryngological and radiological outpatient clinic of one of five selected hospitals in Bangkok; willing to participate in the study; and scoring 25 or more on the Set Test,[20] so as to assure normal mental functioning.

Protection of Human Subjects

The Ethical Committee on Human Rights, of each of the selected hospitals, approved the study prior to data collection. Protection of human rights was maintained in accordance with the revised Helsinki

Declaration. The investigators explained the purpose and method of the study, as well as possible inconveniences that might be experienced from participating in the study. Those consenting to participate were asked to sign a written consent form. All were assured they could refuse to continue at any time without effecting services received. Subjects were instructed to not place their name on the questionnaires. The investigators numbered each questionnaire after it had been completed. Participants were reassured their responses and identities would be kept confidential. Data were kept in a safe place and destroyed after study completion.

Instruments

A total of 7 instruments were used, the: Set Test; Demographic Questionnaire; Modified Symptom Experience Scale (MSES); Buddhist Practices Scale (BPS); Mishel Uncertainty in Illness Scale: Community Version (MUIS-C); Center for Epidemiologic Studies Depression Scale (CES-D); and, Functional Assessment of Cancer Therapy - General (FACT-G) Scale, Version 4. All instruments either had been or were translated into Thai (with back translation into English to assure no change in meaning from the original instrument had occurred) prior to data collection. Permission for use was obtained for all copyrighted instruments.

The Set Test is a pencil and paper test, originally designed by Isaacs and Kennie,[20] and primarily used by Thai.[21] It assesses cognitive function by asking participants to recall, within 1-2 minutes, as many items as they can in each of four successive sets: colors, animals, fruits, and towns. One point is given for each correct response. The maximum score for each set is 10 for a maximum total score of 40. A score of fewer than 15 is indicative of clinically diagnosable dementia. On the other hand, a score of 25 and above indicates normal mental functioning.[20]

The Demographic Questionnaire is a paper and pencil instrument designed and written in Thai by the researchers for the purpose of gathering data related to subjects' age, gender, marital status, years of education, current occupation, family income per month, sources of payment, financial problems, presence of other chronic illness, belief in Karma, Buddhist practices, site and stage of cancer, types of treatment, time since last treatment, and complications related to treatment. It takes approximately 3-5 minutes to complete.

The Modified Symptom Experience Scale (MSES) was modified from the 15-item Symptom Distress Scale[22] and used to assess symptom severity and symptom distress. It consists of 19 of the most common symptoms one may experience from disease and/or side effects of treatments. The instrument is divided into two parts, symptom severity and symptom distress. Subjects rate whether they have experienced a particular symptom in the past week. Items on the severity section of the scale range from 1 (never have symptoms) to 4 (have symptoms all the time). Responses of 2 to 4 are considered to indicate symptom severity. Items on the distress section of the scale range from 1 (not at all) to 4 (unbearable). Scoring of each dimension, severity and distress, is obtained by summing each respective section. The higher the total score, the greater the symptom experienced. The Cronbach's alpha coefficients of the MSES, Thai version, were 0.90 in the pilot study, using 20 patients with HNC, and 0.91 in this study. The tool takes 8 to10 minutes to complete.

Since no adequate instrument existed, the Buddhist Practices Scale (BPS) was designed, by the primary researcher, to measure, through use of a one-factor, 13-item, 4-point Likert-like scale, how often subjects engaged in practice of, and participation in, Buddhist activities. One open-ended question ("*How are Buddhist practices helping you solve your health problem?*") was asked. The scale's development was guided by the: (1) concept of Three Fold Learning

(*Sikkhattaya*: morality, concentration and wisdom); (2) Three Signs of Being (*Tilakkhana*: impermanence, state of conflict and not-self), considered essential ways to solve problems and manage suffering in daily life; [18] and, (3) Buddhist Practices Scale and Buddhist Participation Scale, previously used in comparative religious studies.[23-24] To assure item confirmation, the investigator interviewed twenty Thais with HNC. Participants indicated the frequency with which they practiced and/or participated in the particular Buddhist activity. Each item was assigned a rating from 1 (none of the time) to 4 (all of the time). Total scores were calculated by summing responses of 13 items. Possible scores ranged from 13 to 52. The higher the score, the greater the level of practice of Buddhist activities. The Cronbach's alpha coefficient, both in the pilot study and in this study, was 0.91. It took 3 to 5 minutes to complete the tool.

The Mishel Uncertainty in Illness Scale: Community Version (MUIS-C) is a one-factor, 23-item scale designed to measure uncertainty in non-hospitalized individuals with chronic illness.[25] Subjects responded to each question using a 5-point Likert –like scale, which ranged from 1 (strongly not close to your feeling) to 5 (strongly close to your feeling). All positive item scores were reversed before calculation of the total score. The total score is obtained by summing responses to all items. Possible scores range from 23 to 115. Higher scores indicate higher levels of uncertainty. The MUIS-C Cronbach's alpha coefficient, both in the pilot study and in this study, was 0.90. It takes 8 to 10 minutes to complete.

The Center for Epidemiologic Studies Depression Scale (CES-D) is a 20-item self-report instrument designed by Radloff [26] to evaluate depressive symptoms among the general population. However, it is a sensible tool to use with cancer patients.[27] The CES-D consists of four factors (20 items), including: depressed affect; positive affect; somatic retarded activities; and, interpersonal relationships. Each item is assigned a rating from 0 (rarely or none of the time) to 3 (most or all of the time). Prior to calculating the total score, scores on the four positive items are reversed. Total scores can range from 0 to 60. Higher scores indicate a greater level of depressive symptoms. A score of 0 to 15 indicates lack of depression, while a score of 16 or greater indicates depression.[36] Due to prior studies, conducted in Thailand, having reported higher cut-off scores, than found in Western countries, [28] a cut-off score of 19 or greater was used to indicate depressive symptoms among subjects in this study. The Cronbach's alpha coefficient for the total score was 0.87, with a range of 0.55 to 0.80 among the subscales. It takes 5 to 8 minutes to complete.

The Functional Assessment of Cancer Therapy-General (FACT-G) Scale, Version 4, is a multidimensional outcome measure, designed by Cella et al, [29] to assess QOL among cancer patients receiving treatment. It consists of four subscales (27 items) including: physical well-being (7 items); social/family well-being (7 items); emotional well-being (6 items); and, functional well-being (7 items). Among the 27 items, 15 are positively stated and 12 are negatively stated. Each item is scored from 0 (not at all) to 4 (very much). Scores for negatively stated items were reversed by subtracting the response from "4." After reversing proper items, all subscale items are summed for a total score. Total scores can range from 0 to 108. Higher scores indicate better QOL. The Cronbach's alpha coefficient for the total score was 0.91, with a range of 0.80 to 0.87 among the subscales. It takes 8 to 10 minutes to complete.

Data Collection

Data were collected from August 2006 to July 2007. Administration of the instruments was organized by the variables in the hypothesized model as

follows: 1) MSES; 2) BPS; 3) MUIS-C; 4) CES-D; and, 5) FACT-G. Participants who could read and write completed the questionnaires by themselves. The researchers read the questionnaires to those who were illiterate or had visual problems.

Data Analysis

The Linear Structural Relationship (LISREL) 8.52 was used to analyze data for the: hypotheses testing; hypothesized model; and, modified model testing. Statistical significance was set with an alpha of 0.05.

Results

Demographics: The subject's Set Test scores ranged from 25 to 40 (mean = 31.98). The sample was predominantly married (70.4%) males (70.4%), between the age of 19 to 89 years (mean = 55.17 years), with none to 21 years (mean = 7.58 years) of education, no economic problems (97.1%) and moderate to strong beliefs in karma (77%) and Buddhist practices (85.5%). Although over a third (39.6%) reported monthly family incomes between 2,001 and 100,000 Baht, more than half (52.9%) used universal (30 baht) health care coverage; only 6.3% reported self-paying medical expenses. Nearly a third (30.0%) had lip and oral cavity cancer, with over half (57.1%) of the cancers at stage III or IV. Almost half (42.5%) had been treated using a combination of surgery and radiotherapy for 1 to 12 months (mean = 5.27 months). Most did not have complications related to treatments (91.7%) or another chronic illness (85.4%).

Description of Study Variables: See **Table 1** for description of study variables. The mean, as well as the noted positive value of symptom experience, indicate subjects reported a low level of symptom experience.

The most frequently reported symptoms included: difficulty in swallowing (80.0%); dry mouth (79.2%); thick saliva (76.2%); trouble sleeping (73.3%); and, taste change (72.5%). Subjects indicated greatest distress included; difficulty in swallowing; difficulty in talking; thick saliva; dry mouth; and, difficulty in mastication. However, all did not rate their symptom distress as unbearable.

Buddhist practices scores indicated that most participants had low to moderate levels of practicing Buddhist activities. The majority (85.7%) reported, via the open-ended question regarding Buddhist practices, they had gained various benefits and good outcomes from practicing Buddhist activities, with almost half (47.3%) reporting the activities helped them feel happy and relaxed, as well as establish a peaceful mind. Secondly, regular Buddhist practices contributed to a thought of the nature of human life, nothing is permanent and death is considered as a simple matter (16.07%). Thirdly, they perceived that practicing Buddhist activities, particularly making merit, might redeem past Karma and help them have a good life in the present and in the future (13.39%). They also reported that the more they practiced, the more they had good sleep and good health, which was the way to gain more energy to face suffering (11.61%). Lastly, they believed that the Buddhist activities would improve and empty their mind, and help them cope by accepting their situation (11.61%).

Participants were found to have a moderate level of uncertainty, a low level of depression and no risk of depression (90.8%), since the cutoff score was set at 19 and greater. In addition, most had a high QOL.

Model Testing: Models of symptom experience, depression and QOL were tested using confirmatory factor analysis (CFA). Results indicated all three models fit the data and fell into the "good" model fit. Four goodness-of-fit indices of the three models were at an acceptable level. The chi-square values of symptom experience, depression and QOL

Table 1 Possible range, actual range, means, standard deviations and meaning of mean score of Buddhist practices, uncertainty, depression and quality of life (n = 240)

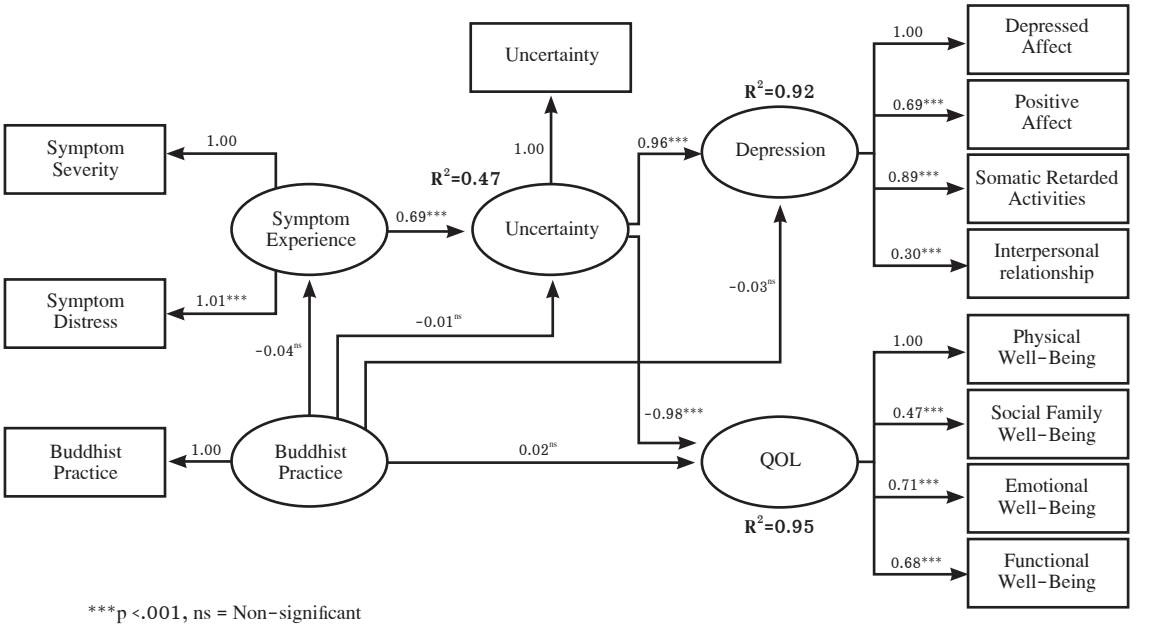
Variables	Possible Range	Actual Range	Mean	SD	Skewness (SE = .157)	Kurtosis (SE = .313)	Meaning (Based on mean)
Symptom-Experience	38 - 152	38 - 99	61.12	13.397	.509	-.227	Low
Symptom - Severity	19 - 76	19 - 53	33.90	7.668	.315	-.369	
Symptom-Distress	19 - 76	19 - 46	27.22	6.224	.636	-.209	
Buddhist-Practices	13 - 52	14 - 49	26.03	7.164	.773	-.026	Moderate
Uncertainty	23 - 115	27 - 84	53.90	13.053	.010	-.722	Moderate
Depression	0 - 60	0 - 32	10.43	6.160	1.012	1.408	Low
Depressed-Affect	0 - 21	0 - 13	1.46	2.157	2.704	9.432	
Positive-Affect	0 - 12	0 - 11	3.89	1.994	.438	.613	
Somatic-Retarded	0 - 21	0 - 14	4.93	2.867	.479	.025	
Interpersonal-Relationship	0 - 6	0 - 3	.14	.489	3.786	14.613	
Depressive Score [<19 = 218 (90.8%), ≥19 = 22 (9.2%)]							
QOL	0 - 108	46 - 103	82.58	10.386	-.558	.203	High
Physical-Well-being	0 - 28	12 - 28	23.57	3.505	-1.104	.844	
Social/Family-Well-being	0 - 28	10 - 28	20.07	3.573	-.020	-.732	
Emotional-Well-being	0 - 24	8 - 24	21.05	2.711	-2.136	6.034	
Functional-Well-being	0 - 28	7 - 28	17.80	3.754	.046	.043	

Note: SD = Standard Deviation; QOL = Quality of Life

were non-significant (p = 0.739, 0.589, 0.503 respectively), and χ^2/df were less than 3.0. Each of the other three goodness-of-fit indices also were at a good level (GFI = 0.999 to 1.000, AGFI = 0.991 to 0.999, RMSEA = 0.000).

Structural Equation Model Testing: Results revealed that the Fit Index Statistics of the hypothesized model were not in an acceptable range (See **Figure 1**). The largest standardized residual was 4.632, which exceeds normal values (± 2.58 or ± 3.29).[30] There also was evidence of misspecified parameters from Buddhist practices to the paths to symptom experience, uncertainty, depression and QOL. Thus, due to the poor goodness of fit, statistics and misspecified parameters, the hypothesized model was determined not to fit the empirical data and had to be modified to improve fit with the indices.

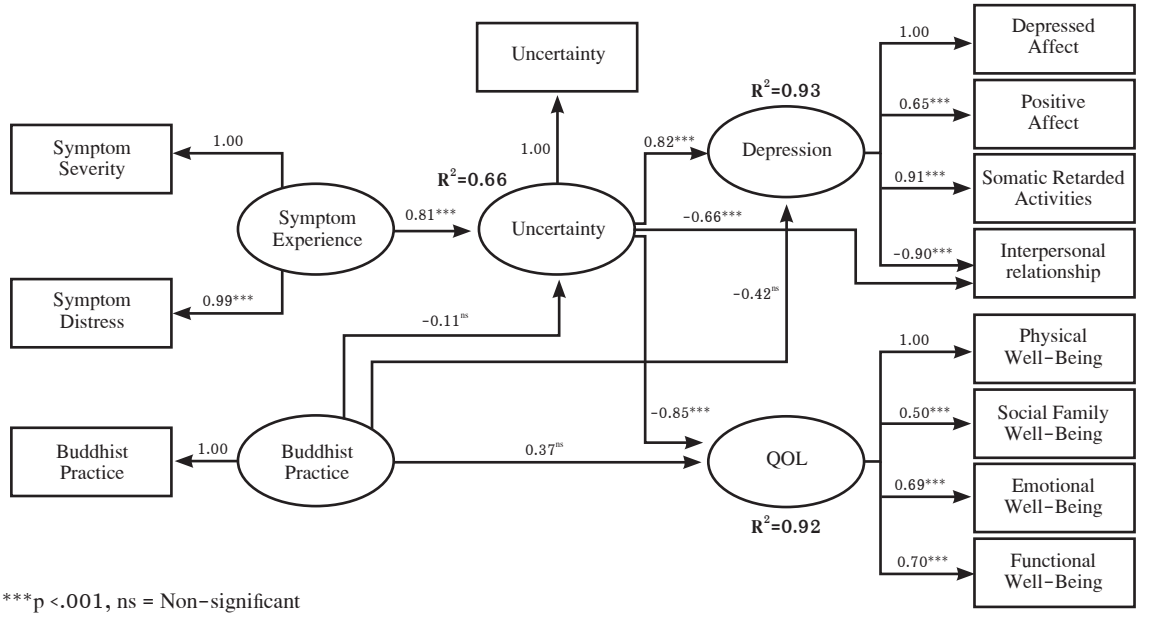
Model modification was performed using the modification indices (MI) and theoretical reasoning as a guideline. The path from Buddhist practices to symptom experience was deleted, due to its low non-significant parameter and parameter estimation. However, the three paths from Buddhist practices to uncertainty, depression and QOL were retained, because of substantive interest in testing the effect of Buddhist practices as a new component of structure providers in the UIT.[22] Results showed increased parameter estimation, with the right direction, but were not significant. All other path coefficients, in the modified model, were significant and conformed to the theory. Modifications were continued until all goodness-of-fit indices were within an acceptable level. The final modified model showed the model fit the data well, and accounted for and explained 66% of variance in uncertainty, 93% in depression and 92% in QOL (see **Figure 2**). The largest standardized residual was within an acceptable level. The total effect, direct effect and indirect effect among the variables are shown in **Table 2**.



***p <.001, ns = Non-significant

Chi-Square(χ^2) = 308.47, df = 48, χ^2/df = 6.43, P-value = 0.000, RMSEA = 0.151, GFI = 0.823, AGFI = 0.712

Figure 1 Hypothesized model of uncertainty to predict QOL among Thais with HNC



***p <.001, ns = Non-significant

Chi-Square(χ^2) = 28.00, df = 21, χ^2/df = 1.33, P-value = 0.140, RMSEA = 0.037, GFI = 0.981, AGFI = 0.929

Figure 2 Modified model of uncertainty to predict QOL among Thais with HNC

Table 2 Direct, indirect and total effects of causal variables on affected variables

Causal Variables	Affected Variables								
	Uncertainty			Depression			QOL		
	TE	IE	DE	TE	IE	DE	TE	IE	DE
Symptom Experience	.81***	-	.81***	.66***	.66***	-	.68***	.68***	-
Buddhist Practices	-.11	-	-.11	-.51	-.09	-.42	.46	.09	.37
Uncertainty	-	-	-	.82***	-	.82***	.85***	-	-.85***
Structural Equation Fit	R^2 = .66			R^2 = .93			R^2 = .92		
Modified Model	χ^2 = 28.00, df = 21, χ^2/ df = 1.33, p = .14, GFI = .981, RMSEA = .037								

Note: QOL = Quality of Life; TE = Total Effect; IE = Indirect Effect; DE = Direct Effect; χ^2 = Chi-square; df = degree of freedom; GFI = Goodness of Fit Index; RMSEA = Root Mean Square Error of Approximation; *** p < .001

Discussion

Most of the subjects reported a low to moderate level of symptom experience. This finding is similar to prior findings, wherein the intensity of the symptoms decreased over time for men with prostate cancer.[22] Although differences in the samples make it difficult to compare findings, the similar findings may be due to the fact that subjects, in this study, completed nearly six months (mean treatment = 5.27 months) of treatment. This amount of treatment might have lead to a reduction of severity and distress of symptoms, i.e. mucositis, shoulder dysfunction, drooling, nasal bleeding, and/or difficulty in closing lip. Findings, in this study, revealed these symptoms were perceived as the five least in severity and distress.

Since most were middle-aged, they may have become more aware of their physical health and developed effective stress management strategies, i.e. problem-focused and/or emotion-focused coping, to help them deal with the stress of their symptom severity and distress experiences.[31] Furthermore, some (5%) participated in regular exercise, even when they were sick. Regular exercise is known to confer physical and psychosocial benefits, i.e. enhancing physical fitness, feeling better about self, reducing stress and gaining better control of one's life. Thus, regular exercise may have led participants to perceive their symptom experience to be low to moderate.

The five symptom occurrences most frequently reported (difficulty in swallowing, dry mouth, thick saliva, trouble sleeping and taste change) were incongruent with prior findings, which showed patients reported the top five symptoms as hoarseness, phlegm in mouth and throat, disfigurement, choking, and fatigue.[32] One explanation of this incongruence may be related to differences in cancer sites investigated. Most, in this study, had lip and oral cavity cancer, followed by cancer of the thyroid and nasopharynx, while laryngeal cancer was the most prevalent cancer in the prior study. As a result, symptoms related to treatments may have been different.

With regard to severity of symptoms, subjects reported the highest levels of severity from the five most common symptoms as: dry mouth, difficulty in talking, thick saliva, difficulty in swallowing and taste change. Findings of symptom severity are consistent with those of an earlier study, wherein dry mouth was the most prevalent symptom in nasopharyngeal cancer during radiation therapy.[33] On the other hand, the top five symptoms for which patients felt distress were: difficulty in swallowing, difficulty in talking, thick saliva, dry mouth and difficulty in mastication.

The findings of symptom distress reflect the subjects being most concerned with problems related to eating, speaking and suffering from xerostomia. These findings are consistent with previous findings,[33-35] which showed individuals with HNC may have compounding problems often directly related to changes in basic functions (i.e. eating, speaking and suffering from xerostomia for more than one year after treatment).

The finding that participants perceived difficulty swallowing to be their greatest cause of symptom distress is in agreement with findings of prior studies, wherein patients with: 1) HNC had impaired swallowing six months after treatment and no improvement after one year of follow-up; [34] and, 2) oral cancer had reduced tongue base swallowing function after treatment completion.[35] One may conclude that there is evidence of swallowing limitations among individuals treated for oral and/or oropharyngeal cancer.

The fact that subjects reported low to moderate Buddhist practice involvement may have been because most activities they had to select from, on the BPS, could be performed either individually or while attending a Buddhist temple or club. Four of the thirteen items (chanting, reading religious books, keeping the Five Precepts, and walking up and down)

were activities they could practice by themselves. Other activities, such as making merit by going to a temple on a holy day or Buddhist festival, and walking around the temple while holding lighted candles, required participation at a temple or Buddhist club. It was expected that subjects would participate in Buddhist activities, given that Thais are believed to have moderate to strong beliefs and will obtain good results from Buddhist practice involvement. However, since most of them were employed and had a family, they may not have had opportunities to be involved in Buddhist activities, due to job and family responsibilities. In addition, they may have been concerned with their general appearance from the side effects of treatment and chose not to participate in Buddhist activities.

The moderate level of uncertainty found is higher than what has been found among Thai women with cervical cancer.[36] However, subjects, in this study, perceived a lower level of uncertainty than did those with atrial fibrillation.[37] One possible explanation may be that participants, in this study, were newly diagnosed with HNC. Thus, they may have perceived less familiarity and more ambiguity regarding physical symptoms, which may have been precipitated by illness and treatments, and not knowing how long symptoms may persist, leading them to perceive a moderate level of uncertainty.

During the modification process, one parameter, from uncertainty to interpersonal relationships subscales of depression, was added, as suggested by the modification indices (MI), in the structural path. Even though no prior studies could be located that had been conducted to examine the relationship between uncertainty and depression among Thais with HNC, this study was supported by the UIT.

Most participants, based on depression scores equal to or greater than 19, had a low level of depression. The depression scores, in this study, were lower than those found among individuals with HIV [38] and breast cancer.[27] These results may be explained by interpersonal factors considered antecedents to depressive symptoms.[39] In addition, the fact the researchers chose to raise the cutoff point for depression, from 16 to 19, may have lead to inability to identify depression that might have been present.

Although previous findings [35] indicate many with facial disfigurements feel stigmatized and have difficulties making friends and obtaining jobs, the social/family subscales of the FACT-G revealed that subjects, in this study, had good relationships with family members and received support from family and friends. One possible explanation may be that the participants were employed, able to earn a living and did not have family economic problems. This may have helped create feelings of hope, self-value and self-esteem, which lead to having a low level of depressive symptoms.

The finding that most subjects had a high level of QOL is consistent with prior findings showing marital status significantly related to QOL, and socioeconomic status to be a strong predictor for QOL.[40] In addition, since participants predominantly were middle-aged men, they may have possessed characteristics of hardiness [31] and been better able to cope with stress. If so, they may have viewed stressful situations as a challenge, which would have helped them remain healthy in the face of stress, and appraised problems as manageable and interesting situations. In addition, most of the men were married, which in the Thai culture means their wife would have been expected to provide care for them during illness. The majority of subjects also reported not having financial problems, thus they may have perceived less stress in their lives.

The findings showed that symptom experience, consistent with prior findings, [41] had a direct positive impact on uncertainty. In addition, the results revealed that symptom experience had an indirect impact on depression and QOL, mediated through uncertainty. Uncertainty also had a direct negative impact on QOL

and a direct positive impact on depression. These findings conform to the UIT, [5] wherein symptom experience is proposed as an antecedent of uncertainty.

The nature of the severity of symptoms presents difficulties when attempting to delineate a symptom pattern with respect to the extent of the disease, resulting in uncertainty. Uncertainty is increased when patterns among symptoms cannot be detected and predicted. If one uses effective coping strategies, a positive adaptation outcome (QOL) occurs. On the other hand, if a person uses ineffective coping strategies, a negative outcome (depression) occurs. These findings are congruent with prior research on post-radiotherapy cervical cancer patients, wherein symptom distress was found to have both direct and indirect effects on psychosocial adjustment through uncertainty.[36]

Conclusions, Limitations and Recommendations

This modified model partially supported the UIT. The findings showed that subjects reported differing perceptions between symptom severity and symptom distress. Thus, nurses should use the findings to assist in the development of specific practice guidelines for the provision of care and management of the most common symptoms patients perceive as being severe and distressful. Furthermore, members of the healthcare team should work on the development of an intervention program that prevents or manages those symptoms, so as to provide better outcomes. An effective symptom management program may help reduce uncertainty, lead to appraisal of uncertainty as an opportunity and encourage the use of effective coping strategies. This, in turn, could contribute to the prevention or reduction of depression, with subsequent improvement of QOL.

Like all studies, this study has limitations. It was a cross-sectional descriptive design, which provided data from only one point in time. These data can be used only as preliminary information for future studies. It would be advisable to obtain data on the study variables over a longer period of time. Regarding generalizability, the study's results can only be applied to the type of sample that was used to estimate and test the structural equation model. Further studies should be conducted in different settings for more explanation and generalizability among Thais with HNC.

It cannot be overlooked that the BPS was researcher developed and used for the first time. Although its reliability showed an acceptable level, the BPS might not have been sufficiently sensitive to measure the subjects' actual Buddhist activities. In the case of Buddhist practices acting as a causal variable in the model, no significant relationships or explained variance was noted. Thus, further studies should test the construct validity and reliability of this instrument, so as to increase its psychometric value. Researchers also may need to consider other emergent findings on the relationship between Buddhist practice and other variables that might be more appropriate in the Thai population, i.e. evaluating this concept as a mediator to help patients cope with stressful life events.

Qualitative research methods can provide a mechanism for understanding one's symptom experience and physical status in a way not achievable through quantitative scales or methods. A qualitative study may be needed for greater in-depth understanding of Buddhist beliefs and Buddhist practices of Thais with HNC.

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การทดสอบทฤษฎีความรู้สึกไม่แน่นอนในความเจ็บป่วยเพื่อทำนายคุณภาพชีวิตในผู้ป่วยมะเร็งบริเวณศีรษะและคอ

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บทคัดย่อ: การศึกษาภาคตัดขวางเชิงบรรยายในครั้งนี้ เพื่อทดสอบทฤษฎีความรู้สึกไม่แน่นอนในความเจ็บป่วยเพื่อทำนายคุณภาพชีวิตของผู้ป่วยมะเร็งบริเวณศีรษะและคอ ตัวแปรที่ศึกษาประกอบด้วย ประสบการณ์การเกิดอาการ การปฏิบัติกิจกรรมทางศาสนาพุทธ ความรู้สึกไม่แน่นอน ภาวะซึมเศร้า และคุณภาพชีวิต ผู้เข้าร่วมการวิจัยคือผู้ป่วยมะเร็งบริเวณศีรษะและคอ จำนวน 240 คน จากโรงพยาบาล 5 แห่งในกรุงเทพมหานคร ประเทศไทย เครื่องมือที่ใช้ประกอบด้วย แบบประเมินเกี่ยวกับการนึกคิดและการจำ แบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามประสบการณ์เกี่ยวกับอาการ แบบวัดการปฏิบัติกิจกรรมทางพุทธศาสนา แบบสอบถามภาวะซึมเศร้า และแบบสอบถามคุณภาพชีวิต รูปแบบที่สร้างขึ้นได้รับการทดสอบและปรับด้วยโปรแกรมลิสเรล 8.52

รูปแบบที่ปรับแล้วมีความสอดคล้องกับข้อมูล และอธิบายความแปรปรวนของตัวแปรความรู้สึกไม่แน่นอน ภาวะซึมเศร้า และคุณภาพชีวิตได้เป็นส่วนใหญ่ ผลการศึกษาพบว่าประสบการณ์การเกิดอาการ มีอิทธิพลทั้งโดยตรงทางบวกต่อความรู้สึกไม่แน่นอน และมีอิทธิพลทางอ้อมต่อภาวะซึมเศร้า และคุณภาพชีวิตผ่านความรู้สึกไม่แน่นอน นอกจากนี้ความรู้สึกไม่แน่นอนมีอิทธิพลโดยตรงทางลบต่อคุณภาพชีวิต และอิทธิพลโดยตรงทางบวกต่อภาวะซึมเศร้า การปฏิบัติกิจกรรมทางศาสนาพุทธมีอิทธิพลโดยตรงทางบวกต่อคุณภาพชีวิตถึงแม้จะไม่มีนัยสำคัญทางสถิติ แต่ไม่มีผลทางอ้อมต่อความรู้สึกไม่แน่นอนผ่านประสบการณ์การเกิดอาการ และไม่มีผลทางอ้อมต่อภาวะซึมเศร้า และคุณภาพชีวิตผ่านความรู้สึกไม่แน่นอน ผลการศึกษาในครั้งนี้ช่วยในการจัดการกับอาการและความรู้สึกไม่แน่นอน ซึ่งส่งเสริมให้สามารถป้องกันหรือลดความซึมเศร้า และเพิ่มคุณภาพชีวิตของผู้ป่วยมะเร็งบริเวณศีรษะและคอได้

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คำสำคัญ: การทดสอบทฤษฎี ความรู้สึกไม่แน่นอน คุณภาพชีวิต มะเร็งบริเวณศีรษะและคอ

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