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Predictive model of death acceptance among Thai Buddhist patients with chronic diseases

Nguyen Hoang Long[1], Sureeporn Thanasilp[2*], Janya Chimluang[2], Kanoklekha Suwannapong[3], Wilailuck Tantitrakul[4], Andrew W. Taylor-Robinson[5,6], Noppamat Pudtong[2] and Ratchaneekorn Upasen[2]

Abstract

Background A chronic disease generally leads to a decline in patients' health and shortened lives. This cross-sectional study examined death acceptance and related factors among Thai Buddhists diagnosed with chronic diseases.

Methods A convenience sample of 423 patients recruited from five tertiary hospitals in Thailand completed self-reported questionnaires.

Results Respondents reported a moderately high level of death acceptance, with a mean score of 39.59 ± 6.52 (out of 48.00). Death anxiety, Buddhist practices, Buddhist belief, and self-efficacy explained 28% of the variance of death acceptance ($R^2 = 0.28$; $F = 25.27$; $p < 0.001$). Among variables, Buddhist belief was the strongest predictor of death acceptance ($\beta = 0.26$, $t = 5.74$, $p < 0.01$), followed by death anxiety ($\beta = -0.23$, $t = -4.84$, $p < 0.05$).

Conclusions Investigation of additional variables is recommended to enhance the model's predictability. Longitudinal studies on how Buddhists' death acceptance changes with disease chronicity are needed to understand this phenomenon fully. Examining whether a causal relationship exists between death anxiety and death acceptance is also recommended.

Clinical trial number Not applicable.

Keywords Buddhist, Chronic disease, Death attitude, Death acceptance, Death anxiety

Background

The incidence of chronic diseases (diabetes, chronic obstructive pulmonary disease - COPD, heart disease, cancer, etc.) is increasing worldwide [1]. While patients suffering from acute conditions, such as infections or injuries, can fully recover, people with chronic diseases must live with their illnesses for many years, often their entire lives. Although the trajectory of a chronic disease consists of various onset and stable periods, it generally leads to a decline in patients' health and shortened lives. In other words, a person who is chronically ill means faces their own mortality [2], and having the disease would inevitably change their perception of life and death

*Correspondence:
Sureeporn Thanasilp
sureeporn.t@chula.ac.th
[1]Faculty of Nursing, Chulalongkorn University, Bangkok 10330, Thailand
[2]Asian Wisdom Care Research Unit, Faculty of Nursing, Chulalongkorn University, Bangkok 10330, Thailand
[3]Royal Thai Navy College of Nursing, Bangkok 10600, Thailand
[4]The Hospital of Excellence in Thai Traditional and Complementary Medicine for Cancer at Sakonnakhon (HTCC) Khampramong Temple, Sakonnakhon 47000, RN, Thailand
[5]College of Health Sciences, VinUniversity 67000, Hanoi, Vietnam
[6]Center for Global Health, University of Pennsylvania, Philadelphia, PA 1904, USA

[3]. A study of 195 individuals with chronic medical conditions reported moderate to high levels in all aspects of death anxiety, including the death of oneself, contemplating the death of oneself, the death of others, and witnessing others dying [4]. This makes death and its associated issues an important topic regarding the mental well-being of this population.

Preparing patients and families for the impending death is an essential component of high-quality end-of-life care [5]. It is evident that patients with no death preparedness demonstrate increased anxiety and depressive symptoms and decreased quality of life compared to those with sufficient death preparedness [6]. According to Wen et al. [6], an integral component of death preparedness is emotional preparation, which "reflects emotionally accepting one's dying role, becoming realistic about the constraints of present circumstances, relinquishing one's unattainable future, and closing, reconciling, and renewing relationship bonds with beloveds to prepare them for life without oneself" (p. 989). From this perspective, one crucial outcome of death preparation is death acceptance. Indeed, some authors consider acceptance essential to a 'good' death [7, 8].

To date, however, the majority of current death studies have focused on death anxiety rather than death acceptance [3, 9–11]. This may be because of an assumption that death is unexpected and unwelcome. Nevertheless, why should death not be seen from a positive perspective if it is unavoidable? Obviously, patients seek medical services in their fight for life and improved well-being. While death is the end-point of life, acceptance of its inevitability is not necessarily the opposite of ceasing to strive to live. Indeed, it might be argued that death brings meaning to life [12], and people who are reconciled to their mortality may have opportunities to prepare better for their own passing while still trying to live as full a life as possible [7, 8].

More importantly, the perspective toward death cannot be fully understood without considering its cultural and spiritual context [12]. Most Thais practice the non-theistic faith of Buddhism and have learned the basic teachings of Buddha from an early age [13, 14]. The practices of Buddhism include such activities as meditation, cultivating mindfulness, listening to Buddha's teachings, and engaging in spiritual conversations. Buddhism introduces a unique perspective toward life and death. To Buddhists, death is natural and inevitable, aligning with three characteristics of the natural cyclical process of life: suffering, impermanence, and egoless nonself. According to this doctrine, a good death, meaning to leave this life peacefully and happily, is important because it leads to better reincarnation or even enlightenment [14]. Death acceptance, which is defined as the integration of physical, verbal, and mental expressions, indicates an individual's understanding and acceptance of death; therefore, it is essential to a good death [15].

Death acceptance is associated with various factors [14]. In the context of Thailand, a study by Krapo et al. [16] on Thai patients found moderately positive associations between death acceptance and Buddhist belief regarding death ($r = 0.43$, $p < 0.05$), self-efficacy ($r = 0.38$, $p < 0.05$), and relationship with family ($r = 0.14$, $p < 0.05$). Suwannapong and colleagues interviewed 800 older people in the community about their acceptance of death. The study found that death anxiety was negatively associated with death acceptance ($r = -0.43$, $p < 0.01$). Factors that were positively related to death acceptance were social support ($r = 0.34$, $p < 0.01$), Buddhist belief about death ($r = 0.39$, $p < 0.01$), and Buddhist practices ($r = 0.29$, $p < 0.01$) [17]. However, these studies were conducted on cancer patients or healthy individuals, while little is known about this issue among chronic disease populations. The current study examines the relationship between several selected key factors and the death acceptance of (Thai) hospital patients receiving treatment for chronic diseases.

Methods

Design and sample

A cross-sectional study was designed and performed. Thailand is divided into 13 health regions. To select the research settings, five were chosen randomly from these regions. After that, one hospital was randomly selected from all public tertiary hospitals in each area. They were Buddhachinaraj Phitsanulok Hospital, Udonthani Hospital, Ratchaburi Hospital, Somdech Phra Nangchao Sirikit Hospital, and Maharaj Nakhon Si Thammarat Hospital.

This study was carried out as a part of a larger project undertaken to describe the path associations among selected factors and death acceptance of Thai individuals. The sample size was calculated based on the number of latent variables of the hypothetical model. The recommended number of subjects needed per one latent variable is 20 [18]. Therefore, with 21 latent variables, the estimated sample size required was 420, with 84 patients from each participating hospital. This was achieved, as the final sample size of the study was 423.

A convenience sampling method was employed in each hospital to recruit from the outpatient department. Patients were invited to participate in the study if they identified as Buddhists, were diagnosed with a chronic disease (including cancer, cardiovascular diseases, and COPD), were aged at least 18 years old, and were able to read and understand Thai.

Instruments and data collection

Data were collected by self-reported questionnaires. Seven instruments were utilized.

The demographic form was designed to obtain each participant's general sociodemographic information, such as age, gender, and occupation.

The modified Buddhist Death Acceptance Scale (BDAS) [15] was used to measure death acceptance. The questionnaire included 12 statements about beliefs and practices that reflect a Buddhist's acceptance of their foreseen death. Respondents rated each item on a scale of 4, from 1 (not true to them) to 4 (true to them). The total score ranged from 12 to 48; the higher a person's score, the greater their level of death acceptance. Cronbach's alpha coefficient of the scale was 0.82, suggesting a good level of internal consistency between questionnaire items.

Self-efficacy was measured by the General Self-Efficacy Scale [19], validated in Thai by Sukmak and colleagues [20]. The questionnaire consisted of 10 items, assessing the strength of respondents' belief in their ability to respond or deal with difficulties and obstacles in life on a scale from 1 (not at all true) to 4 (exactly true). The total score ranged from 10 to 40; the higher a person's score, the greater their self-efficacy. The internal consistency coefficient of the scale was 0.74, considered acceptable [16].

Social support was measured by the Social Support Questionnaire [21], validated in Thai by Hanucharurnkul [22]. The instrument included seven items. Respondents rated the level of support received from others, including healthcare professionals and family, for each item on a five-point scale (from 1, "never," to 5, "always"). The total score ranged from 7 to 35; the higher a person's score, the higher their level of social support. Cronbach's alpha coefficient of the scale was an excellent 0.96.

The severity of illness was investigated by the Perceived Severity of Illness Scale [23]. The questionnaire consisted of 18 items assessing patients' perception of their illness, on a scale from 1 (strongly disagree) to 5 (strongly agree). The sum score of illness severity varied from 18 to 90; the higher a person's score, the more severe their illness. Cronbach's alpha coefficient of the scale was 0.85.

Buddhist practices were assessed using the questionnaire developed by Tantitrakul [24]. The scale included 20 items regarding activities that a Buddhist might perform. Respondents indicated the frequency of carrying out such activities on a five-point scale (from 0, "never," to 4, "always"). The sum score varied from 20 to 100; the higher a person's score, the stronger their adherence to Buddhist practices. The internal consistency coefficient of the scale was 0.82 [17].

Buddhist belief was evaluated by the Buddhist Beliefs about Death Questionnaire [25]. Respondents were asked to indicate the strength of their common Buddhism beliefs on a 13-item three-point scale (from 1, "weakly believe," to 3, "strongly believe"). The sum score ranged from 13 to 39; the higher a person's score, the stronger their belief in Buddhism. Cronbach's alpha coefficient of the instrument was 0.72 [16].

The Death Anxiety Questionnaire [26] was used to examine death anxiety. This was validated in Thai by Krapo et al. [16]. The scale included 15 items concerning respondents' worries about the process of dying and death. Respondents were required to rate on a scale from 0 (no anxiety) to 2 (the highest level of anxiety). The total score varied from 0 to 30; the higher a person's score, the greater their death anxiety. Cronbach's alpha of the instrument was 0.86 [16].

Data were collected from April 2021 to July 2022. Outpatients who attended a healthcare appointment at one of the five tertiary hospitals were invited to participate in the study. After the study was explained and written consent was obtained from each person who agreed to participate, they completed the self-administered questionnaire and passed it to the researcher in attendance.

Statistical analysis

Data analysis was conducted using SPSS version 29.0. Descriptive statistics were used to examine the data. Given the non-parametric nature of the data, Spearman's rank correlation coefficient was utilized to investigate the associations among key variables. Regression analysis was conducted to explore the predictive relationship between dependent and independent variables. The level of significance was set at 0.05 for all tests.

Results

As shown in Table 1, the mean age of participants was 54.26 ± 13.54, more than half (55.1%) of whom were female. Nearly one-third of respondents were either single, divorced, or widowed. A very small number of participants had no schooling (2.8%), while those who completed primary school accounted for the largest proportion. The most frequently identified occupation was a worker/officer (30.7%).

Table 2 provides an overview of the variables examined in the study. The mean score for Severity of illness was 49.42 ± 11.52, while Social support had a mean score of 30.23 ± 4.20. The average score for Self-Efficacy was 31.06 ± 5.55. When compared to the maximum possible scores, participants showed relatively high levels of Buddhist belief (34.14 ± 4.67 out of 39.00), Buddhist practices (76.51 ± 14.32 out of 100.00), and Death anxiety (22.11 ± 6.59 out of 30.00).

The mean score of death acceptance was 39.59 ± 6.52. This is negatively associated with the severity of illness (r = -0.17, $p < 0.01$) and death anxiety (r = -0.36, $p < 0.01$). In contrast, death acceptance has weak and positive associations with social support ($r = 0.22$, $p < 0.01$), self-efficacy

Table 1 Sociodemographic characteristics of participants ($n = 423$)

	Frequency	Percent	Min-Max	Mean ± SD (Median)
Age (years)			17–87	54.26 ± 13.54 (55.00)
≤ 30	20	4.7		
31–40	44	10.4		
41–50	102	24.1		
51–60	119	28.1		
> 60	138	32.6		
Gender				
Male	190	44.9		
Female	233	55.1		
Relationship status				
Single	73	17.3		
Married	293	69.3		
Divorced	27	6.4		
Widowed	30	7.1		
Highest education level*				
No formal education	12	2.8		
Primary school	144	34.0		
Secondary school	53	12.5		
High school	54	12.8		
Vocational school	61	14.4		
Undergraduate degree	84	19.9		
Postgraduate degree	10	2.4		
Occupation				
Business owner	67	15.8		
Farmer	79	18.7		
Worker/Officer	130	30.7		
Public servant	58	13.7		
Others	89	21.0		
Diagnosis				
Cancer	263	62.2		
Cardiovascular Diseases	109	25.8		
COPD	51	12.1		

* 418 cases due to 5 respondents providing incomplete data

Table 3 Factors predicting death acceptance ($n = 423$)

	B	SE	β	t	*p*-value
Constant	19.56	3.53		5.54	< 0.001
Severity of Illness	0.01	0.03	0.02	0.49	0.63
Social Support	-0.02	0.07	-0.01	-0.31	0.76
Self Efficacy	0.21	0.06	0.18	3.64	< 0.001
Buddhist Belief	0.36	0.06	0.26	5.74	< 0.001
Buddhist Practices	0.08	0.02	0.18	3.83	< 0.001
Death Anxiety	-0.22	0.05	-0.23	-4.84	< 0.001

$R = 0.52$; $R^2 = 0.28$; Adjusted $R^2 = 0.27$; $F = 25.27$; $p < 0.001$

($r = 0.31$, $p < 0.01$), Buddhist belief ($r = 0.37$, $p < 0.01$), and Buddhist practices ($r = 0.33$, $p < 0.01$).

As shown in Table 3, severity of illness and social support are not predictors of death acceptance. The model with self-efficacy, Buddhist belief, Buddhist activity, and death anxiety explained 28% of the variance of death acceptance ($R^2 = 0.28$; $F = 25.27$; $p < 0.001$).

Discussion

The current study examined a predictive model of death acceptance among persons of Buddhist belief with chronic diseases. It explained 28% of the variance of death acceptance. This means that the variables included in the model account for, modestly, nearly one-third of death acceptance. While this percentage indicates a large effect size for R^2 [27], there is still room to enhance the predictability of the model. Death and death acceptance are complex and multifactorial phenomena, bounded by various physiological, psychosocial, spiritual, and economic determinants [12]. Obviously, although the selected independent variables reflect the religious (Buddhist practice and Buddhist belief), environmental (social support), diseases (severity of illness), and individual (death anxiety and self-efficacy) factors, the inclusion of variables in our model might not be exhaustive. This may provide a plausible explanation as to why it did not account for a larger variability of death acceptance. Therefore, future studies are recommended to consider additional factors to increase model predictability. For example, qualitative research in a Vietnamese sample found that one motivation for them to accept death was to "unload" the family burden, especially financial hardship. Patients would

Table 2 Associations among studied variables ($n = 423$)

	Mean	SD	1	2	3	4	5	6	7
1. Severity of Illness	49.42	11.52	–						
2. Social Support	30.23	4.20	-0.25**	–					
3. Self Efficacy	31.06	5.55	-0.39**	0.43**	–				
4. Buddhist Belief	34.14	4.67	-0.09	0.23**	0.19**	–			
5. Buddhist Practices	76.51	14.32	-0.07	0.23**	0.18**	0.34**	–		
6. Death Anxiety	22.11	6.59	0.41**	-0.26**	-0.31**	-0.19**	-0.06	–	
7. Death Acceptance	39.59	6.52	-0.17**	0.22**	0.31**	0.37**	0.33**	-0.36**	–

** $p < 0.01$; Spearman's rank correlation

also accept death more easily if they could find others to handle their responsibilities [28].

The mean score of death acceptance was 39.59 ± 6.52, exceeding 80% of the highest possible BDAS score (48.00). Although the BDAS does not use cut-off points, the results suggest a moderate to high level of death acceptance. Nichols and Riegel [29] argued that death acceptance in chronic illness might not be completely positive. Premature acceptance at an early stage of a person's disease may lead to them withdrawing from treatment and other medical support. In contrast, chronic illness may stimulate patients to find the meaning of life. They will then adapt to the new conditions and start perceiving death as a natural part of the cycle of life. This argument is both interesting and plausible. However, although such a process might represent what happens in some populations, whether it applies to Buddhists is debatable. Indeed, in their very first life lessons, Buddhists are taught that death is an integral and natural aspect of all human beings. According to this philosophy, the body of a deceased person will decay since nothing in life is permanent. Illness, pain, bereavement, sorrow, unhappiness, and other physical and emotional challenges are unavoidable. Thus, accepting death and all suffering is taking life as it is. Instilled with such a belief system, Buddhists may not need to wait for months or years after a chronic disease diagnosis to consider death as a natural part of life and thus to find acceptance of it. However, further studies are still needed on death acceptance in Buddhist individuals with changing chronic diseases over time. Such research will be helpful to guide interventions tailored to death acceptance in this specific population.

In the current study, Buddhist belief was the most significant predictor of death acceptance ($\beta = 0.26$, $t = 5.74$, $p < 0.01$). This appears to align with previous findings on the association between religiosity and death acceptance. For example, Daaleman and Dobbs [30] studied American community-dwelling elders with chronic diseases. They indicated that individuals who reported more religiosity and 'closeness to God' demonstrated greater death acceptance. Research by Krapo et al. [16] on Thai cancer patients also reported positive associations between death acceptance and Buddhist belief about death ($r = 0.43$, $p < 0.05$). Interestingly, the practice of Buddhism was not a strong factor in explaining death acceptance ($\beta = 0.18$, $t = 3.83$, $p < 0.01$). Accepting death is seemingly attributable to the patient's mindset. That is why Buddhist belief is a good predicting factor of death acceptance. Nevertheless, since behaviors are influenced by a multitude of factors, regularly following practices expected by Buddhism may not necessarily reflect a strong belief in Buddhist teachings, including the ones relevant to death and death acceptance.

The model used here signaled that death anxiety is negatively related to death acceptance ($\beta = -0.23$, $t = -4.84$, $p < 0.01$). This means that decreased death anxiety would be associated with increased death acceptance. These two death attitudes reflect different, typically opposing, viewpoints. Anxiety is negative, whereas acceptance is a positive feeling about death. However, whether or not the relationship is causal remains unknown. Evidence shows that cognitive behavior therapy, which has the capacity to enhance the acceptance of the reality of death, helps to reduce death anxiety among hypochondriasis patients [31]. This suggests that if such a causal association exists, death acceptance might be the cause, and death anxiety might be the effect. However, further theoretical and empirical investigations are both needed to confirm the nature of the relationship between these two concepts.

Strategies to enhance death acceptance are suggested in the published literature. For example, Morgan and Gazarian [8] proposed that acceptance of death can be learned and educated. The end-point of death education for patients and family members is acceptance and appropriate preparation for the impending death. Interestingly, a study by the first author [12] found that accepting death does not stop cancer patients from trying to live longer. Indeed, striving for life is an attribute of death acceptance. However, death remains a taboo subject and is not commonly or openly discussed, even in conversations between healthcare providers and patients. Consequently, death preparation for patients with chronic conditions is often insufficient [32]. Healthcare providers face challenges in finding ways to improve patients' death acceptance. The current study includes several modifiable factors, such as social support or Buddhist practices, in its predictive model of death acceptance. These variables could provide the focus of future interventions concerning changing patients' death acceptance. Additionally, the confirmed associations in the model offer the foundations for further studies to probe causal relationships between such elements and death acceptance.

The bivariate analysis revealed a negative correlation between death acceptance and both social support ($r = -0.25$, $p < 0.01$) and the severity of illness ($r = -0.17$, $p < 0.01$). However, subsequent regression analysis did not confirm these variables as significant predictors of death acceptance in the model. In contrast, a study involving 800 elderly Thai individuals found that social support had a small, yet direct and positive effect on death acceptance ($\beta = 0.10$, $p < 0.01$) [17]. This suggests that while social support may be linked to death acceptance, it is not a strong predictor. It is important to note that in this study, social support referred to the "quantity" of support patients received. Since death acceptance is an internal process, the amount of external support may not necessarily influence the level of acceptance. Furthermore,

the findings point to a more complex interaction among various factors in predicting death acceptance. Future research should explore how factors such as self-efficacy or death anxiety interact with social support and illness severity to influence death acceptance.

This study has recognized limitations. Firstly, although the research settings were selected randomly from all public tertiary hospitals in five major regions of Thailand, the participants were recruited by convenience sampling. This would limit the generalization of the findings. Secondly, although death acceptance may be influenced by various factors, this study was able to examine only some important predictive variables. In order to enhance the validity of the model, more variables should be included, and the influence of confounding factors such as the nature of the diseases, treatments, age or gender should be controlled. Thirdly, this study focused on a few highly prevalent chronic illnesses in the Thai population, which are cancer, cardiovascular diseases, and COPD. The findings, therefore, might not necessarily represent the perspectives of individuals with other chronic diseases. Additionally, future studies with more specific selection criteria would be valuable for gaining a deeper understanding of death acceptance in patients with particular diseases or at different stages of chronic illness.

Conclusions

The research described herein on 423 Thai Buddhist patients with chronic illness found a moderately high level of death acceptance, with a mean score of 39.59 ± 6.52 (out of 48.00). The model containing the key variables of death anxiety, Buddhist practices, Buddhist belief, and self-efficacy explained 28% of the variance of death acceptance ($R^2 = 0.28$; $F = 25.27$; $p < 0.001$). Investigation of additional variables is advocated in order to enhance the model's predictability. Furthermore, longitudinal studies on how death acceptance by a Buddhist changes with disease chronicity are needed to provide a detailed perspective of the phenomenon in this specific population. Confirming whether or not a causal relationship exists between death anxiety and death acceptance is also highly recommended.

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Author contributions
NL: Conceptualization, Formal analysis, Writing - Original Draft. ST: Conceptualization, Methodology, Supervision, Funding Acquisition. JC: Conceptualization, Investigation, Resources, Supervision. KS: Conceptualization, Project administration, Data Curation, Methodology. WT: Investigation, Formal analysis, Resources, Data Curation. AT: Conceptualization. Methodology, Writing - Review & Editing. RU: Methodology, Resources, Data Curation. NP: Conceptualization, Resources, Writing - Review & Editing. All authors reviewed the manuscript.

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Data availability
The data that support the findings of this study are not openly available due to reasons of sensitivity and are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study complied with the Declaration of Helsinki and was approved by the Ethical Committee of each of the five hospitals where it took place. They were Buddhachinaraj Phitsanulok Hospital (approval number: COA No.025, IRB No. 030/64), Udonthani Hospital (approval number: UDH REC No.34/2564), Ratchaburi Hospital (approval number: COA-RBHEC007/2021), Somdech Phra Nangchao Sirikit Hospital (approval number: COA-NMB-REC 010/64), and Maharaj Nakhon Si Thammarat Hospital (approval number: COE No. 38/2564 REC No. 7/2564). Informed consent was obtained from all participants prior to administering the questionnaires.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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