

Caregivers' knowledge, attitudes and behaviour towards the daily oral care of bedridden patients in Chiang Rai, Thailand

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Objectives: The objectives of this study are to explore caregivers' knowledge, attitudes and behaviours towards oral care for bedridden patients and to examine the relationship among those three variables.

Methods: Participants were 24 caregivers from Muang District, Chiang Rai Province, Thailand, who agreed to be part of the study. Data were collected in January 2020 via a 24-item questionnaire covering knowledge such as understanding what can cause and prevent oral problems, attitudes such as feelings towards providing oral care and behaviours such as actions taken to clean the patient's mouth. Caregivers were also interviewed using a semi-structured guide to further explore their oral health care knowledge, attitudes and behaviours. Descriptive analysis and Chi-square correlation were used to analyse quantitative data. Thematic analysis was used to explore the interview data.

Results: The caregivers' roles were all informal, with an average age of 54.2 years and almost all were female (91.7%). They cared for bedridden patients who were on average 14 years older, comprised mostly of their parents (54.1%) and were partially dentate (79.2%); half were males. Although most caregivers (87.5%) did consider sugar as likely causing tooth decay, one in three did not think that fluoride toothpaste could help to prevent dental decay. None of the edentulous patients and 42.1% of the partially dentate patients had their mouths cleaned by their caregivers daily. Knowledge was not associated with the oral health care behaviour of the caregiver ($P = .43$). Financial constraints, limited knowledge and personal beliefs contributed to caregivers' behaviour towards oral health care for their bedridden patients.

Conclusions: Knowledge remains unassociated with behaviour. Caregiver education and support are needed to maintain good oral health care practices for bedridden patients.

KEYWORDS

ageing, attitude, bedridden, behaviour, caregiver, knowledge, older adults, oral hygiene, practice, self-reported, Thailand

1 | INTRODUCTION

The current number of older adults in Thailand has increased rapidly, and by 2040 they will number approximately 24 million (or more than 32% of the Thai population).¹ Most older adults in Thailand can be quite healthy and have a reduced likelihood of losing their teeth as they age, while others can experience disabilities and comorbidities, including tooth loss.² Unfortunately, for a small number of them, their health will deteriorate to the point where they become bedridden and frail. These older adults in particular have limited mobility and are unable to independently perform activities of daily living (ADLs), including oral care and hygiene.³ In Thailand, it is believed that over 200 000 individuals of various ages are bedridden, with 1035 living in Chiang Rai.⁴ Chiang Rai is Thailand's northernmost province, bordering Laos and Myanmar, and has an overrepresentation of working poor and low-income families.

Bedridden individuals of any age and socioeconomic status depend on caregivers.⁵ Such dependency further increases the risk of any type of abuse and neglectful behaviour, including failure to providing basic necessities like daily oral care.^{6,7} In response to an increase in numbers of the bedridden elderly population, the Thai government has implemented policies for promoting their overall health, particularly focusing on oral care and hygiene.

Poor oral health has been linked to respiratory infections (mainly aspiration pneumonia from oral pathogens⁸) and is a risk factor for death, particularly when associated with poor mastication.⁹ In turn, the responsibility of daily oral care and hygiene for bedridden patients is placed on their caregivers, who often experience both positive and negative aspects of caring.^{5,10,11} Caregiving is generally designated as being either informal and formal care. Informal care usually includes the support and assistance provided by family, friends, or neighbours. Formal care, on the other hand, comes mostly from home-health agencies, assisted living facilities, community organisations and nursing homes.^{12,13}

Regardless of the form of caregiving, the knowledge, attitudes and behaviours of caregivers towards providing daily oral care to bedridden patients significantly influence the effectiveness of such care.^{14–17} However, there is a lack of research on the knowledge, attitudes and behaviours towards daily oral care among caregivers for bedridden patients in Thailand, particularly in Chiang Rai province.

Accordingly, this study aimed to investigate quantitatively and qualitatively the knowledge, attitudes and behaviours of caregivers in providing daily oral care to bedridden patients in that province. The findings presented herein offer information for improving the care of bedridden patients and supporting caregivers in delivering effective daily oral care in the future.

2 | METHODS

This cross-sectional study received an ethics exemption from the Mae Fah Luang Ethics Committee on Human Research (# EC20025-22) due to being part of the 'Practice in Dental Research'

course at the School of Dentistry at the same university. Participants were purposively selected. Inclusion criteria were caregivers aiding bedridden patients in the small jurisdiction of the Sub-District Health Promotion Hospital in Chiang Rai province, who were willing to participate, responsible for most of the ADL care of at least one bedridden individual (from bathing to dressing, feeding and companionship) and able to communicate fluently in Thai. Bedridden patients were also those considered dependent for oral care and hygiene according to the Health District Hospital records. There were in total 24 such caregivers; all were invited by the course instructor via email and phone calls, and all volunteered to participate.

Four senior dental students (5th year of a 6-year program) from the Mae Fah Luang University gathered the data by means of structured surveys and individual interviews as part of their training program. Prior to data collection, the course instructor (KP) further briefed the students on how to gather data using survey and interviews, and to optimise participant engagement. Students were trained to use the research tools by role playing with one another; formal calibration was not performed. The survey had 24 questions about knowledge (such as understanding oral health and prevention; seven questions), attitudes (such as feelings towards providing oral care; nine questions) and behaviours (such as actions taken to clean the patient's mouth; eight questions), with answers in the 'correct/incorrect', 'agree/disagree' and 'practice/do not practice' formats, respectively. Data were analysed using descriptive statistics for means and percentages, and inferential statistics for correlations via the Spearman's rank correlation between knowledge and attitude, knowledge and behaviour and behaviour and attitude, all at $P < .05$.

The audio-recorded individual interviews conducted by the four undergraduate dental students explored participants' understandings of oral health care and hygiene practices, aided by an interview guide with open-ended and probing questions. These questions were adapted from the survey's statements (presented in [Tables 1 and 2](#)), including 'why do you clean (or not) the mouth of your patient (e.g., mother, brother, spouse...) and if you do, how you do it?', 'do you use toothpaste with fluoride when needed? why and why not?', 'what do you do when your patient (e.g., mother, brother, spouse...) has a dental or mouth problem, and why?' The four students were also instructed to add follow-up questions to probe for further information. Interviews took place at the location where the caregiving occurred (at the patient's residence), on the same day the survey was administered. Caregivers were given the option to have the interview in a separate room from where their patients were located. Interviews were audio-recorded in Thai, transcribed and translated into English by the first author (KP), who is fluent in both languages. Transcribed and translated textual data from the interview were analysed thematically to highlight the reason, justification, or rationale of the knowledge, attitude or behaviour of the caregivers. The analysis was iterative, and each team individually read each transcript and then collectively debriefed with the first author (KP). These debriefings were not necessarily aimed at reaching consensus on the patterns of meanings. Rather, they allowed researchers to reflect on their biases, assumptions and preconceptions that could influence

TABLE 1 Knowledge and attitudes of the 24 caregivers towards the oral health care of their bedridden patients.

Knowledge statements	Correct, N (%)	Incorrect, N (%)
1. Fluoridated toothpaste may help to prevent dental decay	16 (66.7)	8 (33.3)
2. Consumption of sugary foods may cause dental decay	21 (87.5)	3 (12.5)
3. When the food remains in the mouth, it may have a negative effect on oral health	20 (83.4)	4 (16.6)
4. Seeing an oral health care provider can help to prevent oral problems	19 (79.2)	5 (20.8)
5. Dentures (removable; complete or partial) should be cleaned daily to reduce the accumulation of bacteria and germs ^a	12 (70.6)	5 (29.4)
6. Dentures (removable; complete or partial) that are not removed at night may cause irritation in the mouth ^a	12 (70.6)	5 (29.4)
7. If the dentures (removable; complete or partial) are too loose or damaged, a dentist should be consulted ^a	12 (70.6)	5 (29.4)
Average	112 (76.2)	35 (23.8)
Attitudinal positions	Agree N (%)	Disagree N (%)
1. If their mouth is not clean, it will have a negative effect on their overall health	19 (79.2)	5 (20.8)
2. The mouth should be cleaned after meals	20 (83.3)	4 (16.7)
3. Cleaning the mouth is a waste of time ^b	3 (12.5)	21 (87.5)
4. Cleaning the mouth is difficult ^b	7 (29.2)	17 (70.8)
5. You feel satisfied when able to clean their mouths	20 (83.3)	4 (16.7)
6. If they have no teeth, there was no need to clean their mouths	8 (33.3)	16 (66.7)
7. You do not clean/stop cleaning when they do not cooperate	15 (62.5)	9 (37.5)
8. For those with dentures (removable; complete or partial), you have to clean them at least 3 times (after meals and before going to bed) ^a	17 (100)	0 (0.00)
9. For those with dentures (removable; complete or partial), wearing them at night does not affect their health ^{a,b}	6 (35.3)	11 (64.7)
Average	148 (74.7) ^c	50 (25.3) ^c

^aOnly applicable to 17 out of 24 patients.^bResponses to questions 3, 4 and 9 under attitudinal positions were inverted, as disagreeing was considered good instead of agreeing with that statement.^cThe averages of questions 8 and 9 were considered out of 17, not 24.

their interpretation of the transcripts.¹⁸ For illustration purposes, we use excerpts from some of the interviews to exemplify the reasoning behind a caregiver's specific behaviour; these excerpts are not

meant to be exhaustive. When applicable, we inform them of the caregiver's age and their relationship to the patient.

3 | RESULTS

Almost all of the 24 participants were female and ranged in age from 16 to 81 years (average, 54.3 years). They were all informal caregivers for their own parents (54.1%, N=13), a close relative (20.8%, N=5), a sibling (12.5%, N=3), a son/daughter (8.3%, N=2) or a life partner (4.2%, N=1) and did not receive financial compensation for the care they provided. The youngest caregiver (age 16) was taking care of their mother, while the oldest (age 81) was taking care of their spouse. Four caregivers (16.7%) were single, 19 (79.2%) were married and one (4.1%) was divorced; most had graduated from primary school (70.8%, N=17). For 91.7% (N=22) of them, that was their first caregiving experience. Most caregivers (58.3%, N=14) had a monthly income of less than 5000 baht (US\$137.72 on June 1, 2024), while 12.5% (N=3) earned more than 10000 baht monthly (US\$275.42 on June 1, 2024).

The individuals receiving care were 12 males and 12 females, with an average age of 68.9 (ranging from 13 to 94 years); 18 of the individuals were older adults. A total of 9 (37.5%) were bedridden due to stroke, seven (29.2%) due to cancer, six (25.0%) due to an accident (motor vehicle or work-related) and two (8.3%) due to congenital diseases such as cerebral palsy. While two patients had all their teeth (4.3%), only 3 were completely edentulous and had dentures; 17 patients had partial dentition with or without removable partial dentures.

Table 1 shows that the majority of caregivers (87.5%) considered sugar consumption as a likely cause of tooth decay in terms of knowledge. One in three caregivers did not think that fluoride toothpaste could help prevent dental decay. In terms of attitude, the majority of the caregivers agreed that the mouth should be cleaned after meals (83.3%). However, the majority of caregivers did not clean, or continued to clean, the mouth when the patient was uncooperative.

Regarding oral care behaviours, none of the edentulous patients, and just over two in five of the partially dentate patients had their mouths cleaned daily by their caregivers. Moreover, two out of three caring for edentulous patients did not take their patients to see a dentist when there was a problem (Table 2). Although there was an association between caregivers' oral health knowledge and attitude towards oral health, there was no such association with their oral health behaviours (Table 3).

All 24 caregivers were interviewed once (duration 19–35 minutes). Analysis revealed some of the reasoning behind a given knowledge, attitude or behaviour, either positive or negative.

An instance of positive knowledge was noted when participants seemed to consider the role of sugar in the process of tooth decay: 'He always liked to eat sweet desserts, like a lot. If he didn't eat them, he would get irritated ... now he has no teeth, they are all gone with holes on them, broken, painful' (51-year-old mother taking care of her 30-year-old son). A positive attitude included those

TABLE 2 Behaviours of the 24 caregivers towards the oral health care of their bedridden patients.

	Patients with all their natural teeth (N = 2)		Patients with some natural teeth (N = 19)		Fully edentulous patients (N = 3)	
	Practice N (%)	DNP* N (%)	Practice N (%)	DNP* N (%)	Practice N (%)	DNP* N (%)
1. Clean the mouth of your patient at least 3 times a day	2 (100)	0 (0)	10 (52.6)	9 (47.4)	0 (0)	3 (100)
2. Brush your patients' teeth with fluoridated toothpaste	2 (100)	0 (0)	11 (57.9)	8 (42.1)	-	-
3. Rinse the mouth of your patient with water after every meal	1 (50)	1 (50)	13 (68.4)	6 (31.6)	1 (33.3)	2 (66.7)
4. Frequently look inside the mouth of your patients for abnormalities	2 (100)	0 (0)	11 (57.9)	8 (42.1)	1 (33.3)	2 (66.7)
5. Wipe the gums and cheeks of your patient with a clean cloth/gauze	-	-	5 (26.3)	14 (73.7)	2 (66.7)	1 (33.3)
6. Clean the dentures of your patient after every meal	-	-	-	-	1 (33.3)	2 (66.7)
7. Remove the dentures of your patients every time before bed	-	-	-	-	1 (33.3)	2 (66.7)
8. Take your patient to see a dentist when there is a problem in their mouth	1 (50)	1 (50)	11 (57.9)	8 (42.1)	1 (33.3)	2 (66.7)
Average	8 (80)	2 (20)	61 (53.5)	53 (46.5)	7 (33.3)	14 (66.7)

Abbreviation: DNP*, do not practice.

TABLE 3 Strength of the relationships (*P* values) between knowledge, attitude and oral health care behaviour of caregivers of bedridden patients (N = 24) according to Spearman's rank correlation.

	Knowledge	Attitude	Behaviour
Knowledge	1.00		
Attitude	0.001783	1.00	
Behaviour	0.428496	0.012866	1.00

instances when the caregivers mentioned the need to look inside the mouth while providing oral hygiene: 'Oral health is as important ...imagine having bad breath, that interferes with living in society, so you have to see what is happening (inside the mouth) when we are brushing that can be causing that' (29-year-old son taking care of his 55-year-old mother). An example of positive behaviour was when participants described encouraging their patients to rinse the mouth after eating. This was indeed confirmed by a 37-year-old female taking care of her 61-year-old uncle: 'After he finished eating, he would always drink water and rinse, he would then get tired and fall asleep. But I know he would fall asleep but couldn't let him do it before rinsing' (37-year-old female taking care of her 61-year-old uncle). We also considered a positive behaviour when the caregivers used fluoride toothpaste to brush patients' teeth, as discussed by a 44-year-old sister taking care of her 49-year-old brother: 'Absolutely, you have to keep using (fluoridated toothpaste). The dentist advised me to do so, to clean better and help the teeth'. Two further positive behaviours included participants' use of a cloth to wipe gums and cheeks: 'I've seen white patches in Grandma's mouth. So, I used a cloth soaked in water to wipe it, and it came out, so I was relieved'

(55-year-old grand-daughter taking care of her 94-year-old grand-mother), and when they were making appointments to see an oral health care provider, as explained by a 52-year-old male taking care of his 79-year-old mother: 'I've taken my mother to the dentist even when she did not cooperate. They examined and said there was a problem that could be addressed, and the tooth saved, preventing further damage'.

Negative knowledge, attitude and behaviours were typically contrary to the ones noted above. That included those participants who mentioned that they did not use fluoridated toothpaste to perform daily oral hygiene: 'I don't think auntie knows the benefit of fluoride in toothpaste, so, she does not use it when I brush. Can it actually help prevent tooth decay?' (32-year-old female taking care of her 65-year-old auntie); 'The mouth feels clean after using herbal toothpaste to brush, so, no need for fluoride, so I use herbal toothpaste' (27-year-old daughter taking care of her 49-year-old father). An example of negative behaviour was identified when the caregivers did not continue cleaning the mouth due to uncooperative behaviour, as was the case for a 52-year-old male taking care of his 79-year-old mother: 'Sometimes my mother refuses to have her teeth brushed. Mother would cry...even shout or bit my hand if I continue brushing her teeth' and for a 39-year-old female taking care of a 59-year-old close relative: 'Well, he just doesn't want to do it. I don't know why there are so many things to do. Even his child tried to clean his mouth, but he does not [allow it] and gets agitated, shaking his head...so, I do not do it'. We considered a negative attitude when participants believed that older adults would eventually lose their teeth: 'Old people's teeth naturally fall out, don't they?' (81-year-old female taking care of her 87-year-old edentulous husband).

An example of negative knowledge held by the caregivers included those who did not clean an edentulous mouth, as voiced by a 47-year-old daughter taking care of her 62-year-old mother: '...and if there are no more teeth in the mouth when you get older...there is nothing to be concerned about'. Lastly, some caregivers did not seek an oral health care provider even where their patients were in need: 'His teeth are broken off and they are loosened...they will fall [out] so you don't have to go see a dentist. It's just a hassle' (21-year-old female taking care of a 61-year-old relative). Others, as was the case of a 7-year-old daughter taking care of her 47-year-old father, made use of a palliative medication instead: 'I do not take him ... if he has a toothache, try something at home, use Kanolone (Triamcinolone Acetonid 0.1%) to see if it goes away because if you want to take him to see a dentist, it's difficult. You have to hire a car for 500 baht (US\$13.87) each time or request a car from the municipality to take you.'

4 | DISCUSSION

Our study explored caregivers' knowledge, attitudes and behaviours towards oral health care for their bedridden patients of various ages and medical conditions, using both qualitative and quantitative approaches. To the best of our knowledge, this was the first study in Chiang Rai, Thailand, to do so and to not limit the caregiving experience to a specific medical condition,^{19–21} or to patients of a certain age.^{22–24}

Our study also included the experiences of a very young–16-year-old adolescent–caregiver, which is very uncommon; most research considers young caregivers as those between the ages of 18 and 21.^{25–27} Young caregivers are faced with the challenge of not only caring for somebody else, but also balancing age-related tasks, including finishing school, finding a hobby, establishing a career and developing personal and romantic relationships.²⁶ Unfortunately, we did not explore such challenges in this study.

Our 24 participants were all informal, which is the most common form of caring^{12,13,28}; it is also the most overburdening considering the close familial relationships of the care provided.²⁹ Our caregivers were caring for patients 14 years older than them on average, with most looking after their parents rather than spouses of a similar age, as found in other studies.^{30–32} Although the caregiving experience was the first for a majority of participants, we did not collect information pertaining to the length of the caregiving experience, which would have enriched the interpretation of the findings.

The overall knowledge and attitudes of caregivers towards the oral health care and hygiene of their patients were considered good. However, our findings also corroborate with the old adage that knowledge does not always lead to, or create, changes in behaviour.³³ For example, being knowledgeable about the effects that poor oral hygiene for teeth and dentures has on the mouth and even the body did not necessarily lead them to practice good oral hygiene. In turn, when our results are considered in light of the potential impacts of poor oral health on the overall health and quality of life of bedridden patients, it becomes imperative to offer simple

yet effective caregiver education.³⁴ Such education must also be accompanied by support services and resources to maintain good oral health care practices for their bedridden patients whose ADLs depend on somebody else.^{35,36} When considering our findings from the surveys and interviews, education can also help to inform us of the benefits of fluoride toothpaste for caries prevention over herbal toothpaste,³⁷ tactics and techniques to perform oral hygiene on uncooperative patients³⁸ and the benefits of cleaning and removing dentures overnight.³⁹ Such education can be advantageous given that the majority (83.3%) of caregivers felt satisfied when able to clean the mouth of their patients.

Lastly, the involvement of undergraduate dental students in research activities such as the one described herein remains a key component of community-driven dental education, fostering social responsibility,⁴⁰ community as the teacher,⁴¹ and outreach.⁴² It can also foster research capacity development that has a long-term impact on valuable learning outcomes for students preparing for professional services, as discussed by Adebisi⁴³ and Howel.⁴⁴

Despite our findings, this study is not without limitations. There was no formal calibration assessment among the students collecting the survey and interview data, although they learnt about the different types of research and were trained in using the research tools. The cross-sectional design prevents inferences of causation, and the relatively small—and purposeful—sample size limited to one geographic area of low socio-economic status jeopardises generalisation. Larger and comparative studies are warranted. Although the knowledge, attitudes and behaviours expressed herein were related to the oral health care and hygiene of somebody else, we did not explore if caregivers shared the same approaches towards their own oral health, which could have enlightened our findings. We also have to consider socially desirable response biases, as the caregivers may have given their answers to the surveys and interviews in a manner that they thought would be viewed favourably by researchers, rather than their actual views. Although the interviews were translated from Thai to English by a bilingual researcher, the translation process might have lost some of the nuances of the original intended responses,⁴⁵ as Thai is regarded as a challenging language to translate due to its distinct scripted vocabulary and language patterns and various cultural considerations. This study was conducted pre-COVID-19, which may have affected the findings given the negative impacts the pandemic initially had on oral health care-seeking behaviour⁴⁶ and oral hygiene⁴⁷ heightened by a lack of agreed-upon protocols⁴⁸ and pandemic preparedness models.⁴⁹ A post-COVID-19 follow-up study is recommended. Although we used both qualitative and quantitative approaches, this study did not involve traditional qualitative research with thematic analysis of codes and themes underlined by a theoretical framework, nor was the textual data collected repeatedly until saturation. This study also did not involve a formal mixed-methods design, which could have integrated both methodologies to offer a more comprehensive and complete understanding of the findings.⁵⁰ Lastly, we did not use the observation of behaviours to validate the accounts we heard from caregivers, which could be added in a future enquiry.

5 | CONCLUSIONS

Although most were knowledgeable, some caregivers' oral hygiene practices were not optimal. Financial constraints, limited knowledge and personal beliefs contributed to caregivers' behaviour towards oral health care for their bedridden patients. Caregiver education and support are needed to maintain good oral health care practices for the patients under their care. Follow-up studies involving caregivers from other Thailand provinces and formal caregiving experiences are warranted.

AUTHOR CONTRIBUTIONS

Pattanaporn contributed to the conception and design of this study, data management and the revised manuscript. Kaewduangsaeng, Panich, Limpaphan and Lakboon contributed to data collection and initial data analysis and revised the manuscript. Brondani contributed to data analysis, drafted the initial and final manuscripts and developed the tables. All authors are in agreement and accountable for all aspects of the work and gave their approval for this publication.

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CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This cross-sectional study received an ethics exemption from the Mae Fah Luang Ethics Committee on Human Research (# EC20025-22) due to being part of the 'Practice in Dental Research' course at the School of Dentistry at the same university.

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