

การเชื่อมโยงความรู้ด้านสุขภาพกับพฤติกรรมสุขภาพช่องปากของแรงงานนอกระบบ: กรณีศึกษาจากภาคตะวันออกเฉียงเหนือของประเทศไทย

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บทคัดย่อ

ความรอบรู้ด้านสุขภาพมีความสัมพันธ์กับพฤติกรรมสุขภาพ อย่างไรก็ตาม มีหลักฐานน้อยมากเกี่ยวกับความสัมพันธ์ระหว่างความรอบรู้ด้านสุขภาพและพฤติกรรมสุขภาพช่องปาก การศึกษานี้เป็นการศึกษานำร่องแบบภาคตัดขวาง โดยมีวัตถุประสงค์เพื่อเปรียบเทียบความรอบรู้ด้านสุขภาพระหว่างกลุ่มอาชีพแรงงานนอกระบบและศึกษาความสัมพันธ์ระหว่างความรอบรู้ด้านสุขภาพและพฤติกรรมสุขภาพช่องปากของกลุ่มแรงงานนอกระบบของอำเภอแห่งหนึ่งในภาคตะวันออกเฉียงเหนือ จากการศึกษากลุ่มตัวอย่าง จำนวน 110 คน พบว่า อาชีพรับจ้างทั่วไปมีความรอบรู้ด้านสุขภาพต่ำกว่าอาชีพเกษตรกรรมและค้าขาย การตรวจสุขภาพช่องปากประจำปีมีความสัมพันธ์กับความรอบรู้ด้านสุขภาพทั้ง 8 องค์ประกอบ ได้แก่ การรับรู้สิทธิขั้นพื้นฐาน การสนับสนุนสุขภาพในชุมชน ความสามารถในการเข้าถึงบริการสุขภาพ การได้รับการสนับสนุนจากครอบครัวและคนใกล้ชิด ความสามารถที่จะได้รับข้อมูลและคำแนะนำที่จำเป็นจากบุคลากรสุขภาพ ความสามารถในการประเมินความน่าเชื่อถือของข้อมูลสุขภาพ ความสามารถในการเข้าถึงข้อมูลสุขภาพที่เหมาะสม และความรับผิดชอบของตนเองต่อสุขภาพ การใช้ยาสีฟันที่มีส่วนผสมของฟลูออไรด์มีความสัมพันธ์กับความรอบรู้ด้านสุขภาพ จำนวน 2 องค์ประกอบ ได้แก่ ความสามารถในการประเมินความน่าเชื่อถือของข้อมูลสุขภาพและความรับผิดชอบต่อตนเองต่อสุขภาพ ผลการศึกษาดังกล่าวสะท้อนให้เห็นว่าแบบสอบถามความรอบรู้ด้านสุขภาพสามารถใช้เป็นเครื่องมืออย่างง่ายในการคัดกรองพฤติกรรมสุขภาพช่องปาก

คำสำคัญ: ความรอบรู้ด้านสุขภาพ พฤติกรรมสุขภาพช่องปาก แรงงานนอกระบบ ประชากรวัยทำงาน ประเทศไทย

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Association between health literacy and oral health behaviour
Among informal sector workers: A case study from North- Eastern Thailand

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Abstract

Health literacy (HL) has been reported to be associated with health behaviour. However, evidence on HL and oral health behaviour is scarce. This cross-sectional pilot study aimed to compare HL across informal occupation groups and to examine the association between HL and oral health behaviour among informal sector workers in a district in Northeastern Thailand. The result of the study suggests that among 110 participants, general labourers had the lowest HL score compared with agricultural labourers and retailers. A regular dental visit was found to be associated with all eight HL domains: knowledge about service entitlements, resources that support health in the neighbourhood, ability to access health services, close support people, ability to get the information and advice as needed from health professionals, evaluating the trustworthiness of health information, ability to find suitable health information, and accepting responsibility for health. Using fluoride toothpaste was associated with two HL domains: evaluating the trustworthiness of health information and accepting responsibility for health. The findings imply that HL questionnaire can be used as a simple screening tool for oral health behaviour.

Keywords: health literacy; oral health behaviour; informal sector workers; working age population, Thailand

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Introduction

Oral health is one of global burdens of disease as well as economic burdens that pose a health challenge for several countries (Peres et al., 2019). Almost 3.5 billion people have been affected by oral diseases, and its prevalence can be said to be 'disproportionate distribution,' by which nearly 4 times more middle- and low-income countries have been affected than high-income countries (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018). Major oral health conditions include untreated dental caries and periodontal diseases that could lead to pain and dental loss in the future, yet these conditions are preventable and can be treated if detected early (WHO, 2020).

In Thailand, the National Oral Health Survey Data 2017, which collected a national sample of 4,683 participants who were in the working age, showed similar oral health problems as that of WHO 2020: untreated dental caries accounted for 43.3% and periodontal diseases accounted for 62.4% (Bureau of Dental Health, 2018). Although in Thailand, public health insurance schemes - the Universal Coverage Scheme (UCS), Social Security Scheme (SSS), or Civil Servant Medical Benefit Scheme (CSMBS) - include basic dental services under the benefit package, the utilization of dental services during the past 12 months among working adult population aged 15-59 years has shown a downward trend compared with those from 2013 to 2015, particularly among the middle and late working aged group, while the maximum drop was found among those aged 45-49 years at 23% (Akrasut, 2018).

More than half (53.8%) of Thai workers were employed in the informal sector (National Statistical Office, 2020). Although informal sector workers are covered by the UCS, which includes basic dental services under their registered health providers, the utilization of dental services among UCS working population was lower than the two other public health insurance schemes (Jaichuen, 2016). Thus, oral health promotion interventions and strategies are needed to improve oral health and dental access of the working age population, particularly among the workers in the informal sector in Thailand.

Health Literacy (HL) has been defined as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health" (Nutbeam, 1998). Following this definition and previous studies, HL is a multidimensional concept (Batterham, Hawkins, Collins, Buchbinder, & Osborne, 2016; Cepova, Cicvakova, Kolarcik, Markovska, & Geckova, 2018; Sørensen et al., 2012), which requires broad dimensions to assess individual competencies and experiences when interacting with community and health professionals in the health system (Batterham, Beauchamp, & Osborne, 2017; Puhan, Ahuja, Van Natta, Ackatz, & Meinert, 2011). As a result, multidimensional tools for measuring HL have been developed to identify weakness and strength of particular dimensions, rather than to identify prevalence of low health literacy (Ghanbari, Ramezankhani, Montazeri, & Mehrabi, 2016; Kolarcik et al., 2017; Osborne, Batterham, Elsworth, Hawkins, & Buchbinder, 2013).

Previous studies have established the relationship between HL and health behaviours, which cause the burden of diseases such as smoking, drinking/ alcohol use, unhealthy diet, and physical inactivity (Aaby, Friis, Christensen, Rowlands, & Maindal, 2017; Buja et al., 2020; Chisolm, Manganello, Kelleher, & Marshal, 2014; Friis, Vind, Simmons, & Maindal, 2016; Geboers, de Winter, Luten, Jansen, & Reijneveld, 2014; Levin-Zamir, Baron-Epel, Cohen, & Elhayany, 2016; Stewart et al., 2013). Despite its health burden, there is scarce information on the relationship between HL and oral health behaviour using the multiple dimensions of HL questionnaire (Cepova et al., 2018).

Regular tooth-brushing was associated with HL in five domains: 'feeling understood and supported by a healthcare provider', 'having sufficient information to manage my health', 'actively managing my health', 'social support for health', and 'appraisal of health information' (Cepova and colleagues, 2018). It explored the association between multidimensional HL and oral health promotion behaviours among the Slovak general adult population. The use of interdental tools was associated with HL in two domains: 'feeling understood and supported by a healthcare provider' and 'having sufficient information to manage my health'. A dental visit for prevention was also found to be associated with 'social support for health' while using fluoride toothpaste was associated with 'ability to find good health information.' However, the study had some limitations, including being conducted only among the European population attending dental clinics, which may not be generalisable to other global regions with different socio-cultural contexts and among persons who do not utilise or even have access to dental services. To our knowledge, there has not been a study that explored the relationship between HL and oral health behaviour among the working age population in the Southeast Asian context, where the majority of the working population is in the informal sector and access to dental service is a common health challenge.

This pilot study was conducted in a small district at 210.9 km² in Nong Khai, Thailand, which had the population of 26,541 in 2020. Of the total population, the working age population accounted for 65.9%. This district was chosen because the majority of the working age population are UCS beneficiaries in the informal sector: agricultural labourers (e.g, crops, plants, farming, animals), general labourers (e.g., workers in construction sites outside the district, truck drivers), or retailers (e.g., sellers in fresh market). The common registered public providers for dental service were a district hospital and health centers in the district close to home. The dental service is available for informal sector workers only during official working hours. Multiple dimensions of HL Questionnaire were used to compare HL across the informal occupation group and to examine the association between HL and oral health behaviour among informal sector workers in a district in Northeastern Thailand. Findings from this study could provide implications on the use of HL tool to address oral health behaviours.

Methodology

Study design and target sample

This cross-sectional study applied a purposive sampling of workers employed in the informal sector living in a district in Northeastern Thailand. The purposive sampling was employed in this study to ensure that the target sample met all the inclusive criteria given below. Informal employment included all remunerative works (i.e. both self-employment and wage employment) that are not protected by the legal frameworks. Thus, informal sector workers have neither secure employment contracts nor social security from work.

Participants were invited to participate in the study by dental staff or volunteer health workers in the target district from March 2020 to May 2020. Inclusion criteria were (1) Thai citizenship aged 18-59 years who resided in the district, (2) entitled to the UCS scheme and the registered public provider was either a district hospital or a health center in the district, (3) had paid informal employment and, (4) did not a volunteer health worker. Those who met the inclusion criteria and consented to participate were then asked to complete a self-administered questionnaire which took approximately 15 minutes to finish. The participants who had reading difficulty were interviewed by the trained volunteer health workers. A set of toothpaste and toothbrush was given to the participants who returned a questionnaire as a small token of appreciation. Data were eventually obtained from 134 participants. The individuals with missing values in the health literacy scale and outliers, were excluded, and, therefore, a total of 110 participants were analysed.

Measurements

This study used a validated multidimensional Thai Health Literacy (HQL) scale developed by Wanitkun, Pattaramongkolrit, Vichathai, Bhechrung, Kloyahem, Batterham, & Osborne (2014). The Thai HQL had eight core domains comprising 33 items ($\alpha = .94$), each with a separate score on a 10-point scale from totally agree to totally disagree response options. The score of each domain was calculated from the mean. The scores were used to compare across HL domains and occupation groups. The higher score means higher HL in comparison. This questionnaire has been used in other published studies in Thailand (Choocherd, Wanitkun, & Danaidusadeekul, 2016; Jitaurangkoon & Wanitkun, 2017). The Thai HQL was developed to identify strengths and weaknesses of each domain with 8 scales as follows:

(1) Knowledge about service entitlements (KSE: 4 items) (e.g., "I know the places where I am entitled to receive health services")

(2) Resources that support health in the neighbourhood (RSN: 4 items) (e.g., "I can conveniently access places for exercise")

(3) Ability to access health services (AHS: 5 items) (e.g., "I can easily find the health services that I need")

(4) Ability to get the information and advice as needed from health professionals (AIP: 4 items) (e.g., "I understand advice given by health service staff")

(5) Close support people (CSP: 4 items) (e.g., "I can find people to help take care of my health when necessary")

(6) Ability to find suitable health information (AHI: 4 items) (e.g., “I know several sources of information about caring for my health”)

(7) Evaluating the trustworthiness of health information (EHI: 4 items) (e.g., “I know sources of trustworthy information about health”)

(8) Accepting responsibility for health (ARH: 4 items) (e.g., “I believe that good health comes from my own actions”)

Socio-demographic variables included gender, age, education, and occupation. In accordance with the Thailand Ministry of Public Health, age was categorised into three groups: (1) early working age (18-29 years), (2) middle working age (30-44 years), and (3) late working age (45-59 years). Occupation was categorised into general labourers, agricultural labourers, and retailers.

Oral health behaviour was a dichotomous variable measured through 4 items: (1) dental visit during the past 12 months (yes/no): if no, respondents were asked to give the reasons for not visiting the dentist during the past 12 months, (2) using toothpaste with fluoride (yes/no), (3) duration of brushing for 2 minutes or more (yes/no), and (4) searching for oral health information (yes/no).

Statistical analysis

Statistical analyses were performed with STATA version 11. Descriptive statistics and chi-square tests were used to analyse the respondent characteristics. One-way ANOVA and Kruskal–Wallis were used to compare health literacy across the informal occupation groups. Note that Kruskal–Wallis was used for non-normal distributions. Multiple logistic regressions were conducted to determine the association of oral health behaviour and health literacy, controlled for gender and education. The results are presented as odds ratios (OR) with 95% confidence intervals. All tests were two-sided with p-values less than 0.05 as statistically significant.

Ethical considerations

All participants provided written informed consents prior to beginning the questionnaire. The ethical approval was granted on 13 January 2020 by the Institute for the Development of Human Research Protection, Thailand (IHRP No. 2020009).

Results

Sample characteristics

Of 110 participants, the majority were females (60.91%), and almost half were general labourers (49.09%), and aged between 45-59 years (45.45%). Significant differences across occupations were observed in gender, age, education, dental visit within the past 12 months, and toothpaste with fluoride, but not in over two minutes brushing and search for oral health information (Table 1).

Table 1. Descriptive statistics of all variables used in the analysis by the informal occupation groups (N=110)

| Variable | Total <i>n</i> (%) | General labourer <i>n</i> (%) | Agricultural labourer <i>n</i> (%) | Retailer <i>n</i> (%) | <i>P</i> value |
|------------------------------------|-----------------------|-------------------------------------|--|--------------------------|----------------|
| Gender | | | | | |
| Male | 43 (39.09) | 31(57.41) | 5 (21.74) | 7(21.21) | 0.001 |
| Female | 67 (60.91) | 23(42.59) | 18 (78.26) | 26(78.79) | |
| Age | | | | | |
| 18-29 years | 27(24.55) | 17(31.48) | 0(0.00) | 10(30.30) | 0.001 |
| 30-44 years | 33(30.00) | 20(37.04) | 4(17.39) | 9(27.27) | |
| 45-59 years | 50(45.45) | 17(31.48) | 19 (82.61) | 14(42.43) | |
| Education | | | | | |
| Primary school or lower | 54(49.09) | 24(44.44) | 18(78.26) | 12(36.36) | 0.005 |
| Secondary school or higher | 56(50.91) | 30(55.56) | 5(21.74) | 21(63.64) | |
| Oral health behaviors | | | | | |
| Dental visit | | | | | |
| Yes | 28(25.45) | 7(12.96) | 9(39.13) | 12(36.36) | 0.012 |
| No | 82(74.55) | 47(87.04) | 14(60.87) | 21(63.64) | |
| Toothpaste with fluoride | | | | | |
| Yes | 40(36.36) | 14(25.93) | 8(34.78) | 18(54.55) | 0.026 |
| No | 70(63.64) | 40(74.07) | 15(65.22) | 15(45.45) | |
| Over two minutes brushing | | | | | |
| Yes | 15(13.64) | 6(11.11) | 4(17.39) | 5(15.15) | 0.729 |
| No | 95(86.36) | 48(88.89) | 19(82.61) | 28(84.85) | |
| Search for oral health info | | | | | |
| Yes | 82(25.45) | 13(24.07) | 5(21.74) | 10(30.30) | 0.730 |
| No | 28(74.55) | 41(75.93) | 18(78.26) | 23(69.70) | |

Note: Chi-square test. Bold values denote statistical significance with the $p < 0.05$ level.

Eighty-two non-dental utilization respondents, cited the main reason for not visiting the dentist was no symptoms (88.75%), followed by dental fear (18.75%) and no time (17.50%). Obviously, among three informal occupations, the retailers reported a greater proportion of dental fear (28.57%) than the other groups (Table 2).

Table 2. Reasons for not visiting the dentist during the past 12 months

| | Total | General labourer | Agricultural labourer | Retailer | <i>P</i> value |
|------------------------|--------------|------------------|-----------------------|--------------|----------------|
| | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | <i>n</i> (%) | |
| No symptoms | 71(88.75) | 43(95.56) | 11(78.57) | 17(80.95) | 0.090 |
| Dental fear | 15(18.75) | 8(17.78) | 1(7.14) | 6(28.57) | 0.273 |
| No time | 14(17.50) | 9(20.00) | 1(7.14) | 4(19.05) | 0.530 |
| Travel distance | 2(2.50) | 0(0.00) | 0(0.00) | 2(9.52) | 0.056 |
| No accompanying person | 2(2.50) | 0(0.00) | 1(7.14) | 1(4.76) | 0.243 |
| Travel fee | 2(2.50) | 2(4.44) | 0(0.00) | 0(0.00) | 0.450 |
| Dental cost | 1(1.25) | 0(0.00) | 0(0.00) | 1(4.76) | 0.241 |
| Long waiting time | 1(1.25) | 1(2.22) | 0(0.00) | 0(0.00) | 0.674 |

Note: Chi-square test. More than one reason was selected. Only respondents who did not have a dental visit during the past 12 months are included.

Observable differences were found across HL domains. The highest HL mean score was found for 'ability to get the information and advice as needed from health professionals', while the lowest mean score was found for 'evaluating the trustworthiness of health information'.

HL domain scores significantly varied among different informal occupation groups. Retailers and agricultural labourers tended to score significantly higher than general labourers in all domains, excepting in the 'knowledge about service entitlements' (KSE), which did not show any statistical significance. By contrast, retailers tended to score higher than agricultural labourers in all domains, but not in the KSE (Table 3).

Table 3. Differences in health literacy domains by occupation (*N*=110)

| HL domains | Total (<i>N</i> =110) | | General labourer (<i>n</i> =54) | | Agricultural labourer (<i>n</i> =23) | | Retailer (<i>n</i> =33) | | <i>P</i> value |
|------------|------------------------|------|----------------------------------|------|---------------------------------------|------|--------------------------|------|----------------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| KSE | 7.93 | 0.99 | 7.75 | 0.87 | 8.12 | 1.08 | 8.08 | 1.10 | 0.186 |
| RSN | 8.00 | 1.50 | 7.75 | 1.50 | 7.75 | 1.50 | 8.25 | 1.00 | 0.038 |
| AHS | 7.98 | 0.96 | 7.75 | 0.87 | 8.08 | 1.15 | 8.30 | 0.88 | 0.029 |
| AIP | 8.50 | 1.50 | 8.00 | 1.75 | 8.25 | 1.25 | 8.75 | 1.25 | 0.012 |
| CSP | 7.99 | 1.09 | 7.66 | 1.14 | 8.16 | 0.96 | 8.42 | 0.94 | 0.004 |
| AHI | 7.71 | 1.15 | 7.44 | 1.08 | 7.68 | 1.29 | 8.17 | 1.01 | 0.013 |
| EHI | 7.61 | 1.14 | 7.24 | 1.11 | 7.64 | 1.14 | 8.19 | 0.98 | 0.001 |
| ARH | 8.25 | 1.25 | 8.00 | 1.75 | 8.25 | 0.75 | 8.50 | 1.00 | 0.004 |

Note: One-way ANOVA test for KSE, AHS, CSP, AHI, EHI. Kruskal-Wallis test for RSN, AIP, and ARH. Bold values denote statistical significance with the $p < 0.05$ level.

KSE = Knowledge about service entitlements, RSN = Resources that support health in the neighbourhood, AHS = Ability to access health services, AIP = Ability to get the information and advice as needed from health professionals, CSP = Close support people, AHI = Ability to find suitable health information, EHI = Evaluating the trustworthiness of health information, ARH = Accepting responsibility for health

Table 4 shows the odds ratios (OR) of health literacy (HL) domains in relation to oral health behaviour. After adjusting for gender and education, respondents who had higher scores in all eight HL domains were more likely to visit a dentist during the past 12 months. Additionally, respondents who had higher score of 'evaluating the trustworthiness of health information (EHI)' and 'accepting responsibility for health (ARH)' were more likely to use a toothpaste with fluoride. No significant differences were observed for the association between HL domains with searching for oral health information.

Table 4. The association between health literacy domains and oral health behavior (N=110)

| HL domains | Dental visit | | Toothpaste with fluoride | | Search for oral health information | |
|------------|-------------------|----------------|--------------------------|----------------|------------------------------------|----------------|
| | (Yes) | | (Yes) | | (Yes) | |
| | OR (95% CI) | <i>P</i> value | OR (95% CI) | <i>P</i> value | OR (95% CI) | <i>P</i> value |
| KSE | 2.39 (1.41, 4.04) | 0.001 | 1.24 (0.82, 1.89) | 0.306 | 1.48 (0.91, 2.39) | 0.115 |
| RSN | 2.19 (1.28, 3.73) | 0.004 | 1.50 (0.99, 2.28) | 0.057 | 0.92 (0.61, 1.41) | 0.715 |
| AHS | 1.96 (1.17, 3.29) | 0.011 | 1.52 (0.97, 2.37) | 0.067 | 1.22 (0.76, 1.97) | 0.415 |
| AIP | 1.84 (1.10, 3.09) | 0.021 | 1.28 (0.85, 1.95) | 0.243 | 1.19 (0.77, 1.85) | 0.439 |
| CSP | 1.94 (1.19, 3.17) | 0.008 | 1.30 (0.88, 1.92) | 0.183 | 0.80 (0.54, 1.19) | 0.274 |
| AHI | 1.94 (1.21, 3.11) | 0.006 | 1.34 (0.92, 1.96) | 0.126 | 1.20 (0.80, 1.80) | 0.381 |
| EHI | 2.91 (1.60, 5.32) | 0.001 | 1.74 (1.14, 2.64) | 0.010 | 1.16 (0.76, 1.78) | 0.478 |
| ARH | 1.79 (1.08, 2.97) | 0.023 | 1.80 (1.15, 2.81) | 0.010 | 1.06 (0.70, 1.61) | 0.787 |

Note: Multiple logistic regression model adjusted for gender and education of particular domain of health literacy on the outcome variable.

Bold values denotes statistical significance with the $p < 0.05$ level, OR = odds ratio, 95% CI = confidence interval

KSE = Knowledge about service entitlements, RSN= Resources that support health in the neighbourhood, AHS= Ability to access health services, AIP= Ability to get the information and advice as needed from health professionals, CSP= Close support people, AHI= Ability to find suitable health information, EHI =Evaluating the trustworthiness of health information, ARH= Accepting responsibility for health

Discussion

This pilot study provides new insights to the health literacy (HL) research by showing that HL domain scores significantly varied across the informal occupation groups and had association with oral health behaviours among informal employment sector workers in a district in Northeastern Thailand. Higher HL in the eight domains were associated with dental visits and using toothpaste with fluoride.

Despite existing literature on differences between socioeconomic status variables (e.g., gender, education, income, employment status) and HL (Cho, Lee, Lim, & Lee, 2020; Furuya, Kondo, Yamagata, & Hashimoto, 2015), none of the studies published has explored the different levels of HL among occupation groups in the informal employment sector. Findings showed differences of HL score across the informal occupation groups where general labourers had lower HL scores, across all domains, than agricultural labourers and retailers. In addition, among the three informal occupation groups, general labourers had the worst oral health behaviours with disproportionately less regular dental visits and the use of toothpaste with

fluoride. This finding can be explained by the fact that general labourers usually work outside the community during the day and come back at night, so they cannot utilize a dental service during the working hours at public dental settings and it is difficult for health personnel or volunteer health workers to reach them whether it is for inputting health information or for health promotion activities. Therefore, the future of health promotion intervention, including oral health, should be developed in response to different HL needs and working conditions of the informal employment sector group, especially the general labourers.

Another important finding is that higher HL across eight domains were associated with a regular dental visit. A regular dental visit associated with four individual competencies of HL: 'knowledge about service entitlements (KSE)' illustrating the ability to exercise their right entitlements, 'evaluating the trustworthiness of health information (EHI)' indicating the ability to appraise the reliability of health information, and 'ability to find suitable health information (AHI)' illustrating ability to access the appropriate health information, and 'accepting responsibility for health (ARH)' indicating awareness on self-responsibility for health. This finding is in accordance with those of the previous studies (Henderson, Dalawari, Fitzgerald, & Hinyard, 2018; Naghibi Sistani, Virtanen, Yazdani, & Murtomaa, 2017). People who are aware of their right to health services and those who have capacities of accessing, understanding, and evaluating health information as well as self-awareness of health, would recognise the importance of a regular dental visit. In addition, the regular dental visit was associated with the two social components of HL, 'resources that support health in the neighbourhood (RSN)' indicating the ability to find the place/equipment for promoting health and to get support on health from the neighbours, and 'close support people (CSP)' illustrating the ability to get support on health from friends or family, similar to the previous research showing that people who enjoyed high level of the social support were more likely to visit the dentist for prevention (Cepova et al., 2018). Thus, RSN and CSP can be viewed as a social enabling factor for dental visits. Lastly, a regular dental visit associated with experiences with health professionals and the health system: 'ability to get the information and advice as needed from health professionals (AIP)' illustrating the ability of a person to communicate when interacting with health professionals and 'ability to access health services (AHS)' indicating the ability to use health services when necessary. Thus, those who received the support from health providers and the health system were more likely to have a regular dental visit. The AIP and AHS reflect the ability of the health system to equitable access to health services, including dental services. Therefore, it can be concluded that these eight HL domains could identify people who had dental visits during the past 12 months.

Additionally, 'evaluating the trustworthiness of health information (EHI)' and 'accepting responsibility for health (ARH)' were associated with using fluoride toothpaste. One explanation is that people who can evaluate health information and are responsible for their own health would recognise that fluoride is an important ingredient for tooth decay prevention when choosing their toothpaste. However, the results of our study slightly differ from previous research which found that 'appraisal of health information' and 'actively managing my health' were not associated with fluoride toothpaste use, and only the 'ability to find good health information'

was (Cepova et al., 2018). Regardless, it still can be concluded that skill and ability to evaluate health information are associated with people who use toothpaste with fluoride.

The dental provision concept emphasises regular dental visits to maintain good oral health and prevent advance treatment costs. Accessing dental services once symptoms are present may be too late and subsequently require comprehensive treatments that come with high costs, greater pain, higher risk of infections, and potential tooth loss. Our findings showed that the majority of the informal sector workers did not visit the dentist during the past 12 months due to not having symptoms. This reason was similar to that found in the previous study conducted among Thai older persons (Saengtipbovorn, Taneepanichskul, Pongpanich, & Boonyamanond, 2012). Thus, a regular dental visit without symptoms—as primary prevention—once or twice a year must be widely scaled among informal sector workers through various communication channels to improve their accessibility and willingness to do so. A regular dental visit is important not only because it is a preventive measure, but also because it is the channel which people could access to reliable oral health information. It is an opportunity where dental personnel can provide oral health promotion information and good oral practice (e.g., tooth brushing, using interdental floss), including the information on dental care benefits of the entitled scheme during the dental visit in a dental setting. Thus, dental personnel could enhance HL among the working age population as well. This is supported by the results of Thai National Oral Health Survey that found more than half of the working age population (55%) accessed to health information via health professionals (Bureau of Dental Health, 2018).

The administration method of questionnaire consisted of self- and interviewer- administered questionnaire. The reason to include interviewer- administered questionnaire was some participants were unable to read or illiterate. However, they should not be excluded from this study due to their abilities to read. The format and wording of questionnaire were similar for both methods. Previous studies showed that there was no significant difference between self- administered and interviewer- administered questionnaire (Puhan et al., 2011; Tsakos, Bernabé, O'Brien, Sheiham, & de Oliveira, 2008). Thus, the different in administration formats would not have significant effect on the results of this study.

Limitations and future research directions

One important limitation of this study is that the sample was small. This study planned to collect at least 392 participants according to the calculation formula of Yamane (1967), but the calculated sample size was not reached during the data collection due to the fact that the data was unavoidably collected during COVID-19 pandemic. To address this limitation, our models included only potential two control variables to increase the power of prediction. In addition, the exact p-values were shown in order that the readers can consider the level of significance for reference. Again, this is a pilot study to explore the feasibility and usability of HL tool in oral health behaviour. Thus, the results of this study may not be generalised to the overall informal sector worker population in Thailand. However, our findings are similar to those of the previous research and support the relationship between HL and oral health behaviours. Thus, the future research should increase the sample size

and be conducted in different contexts such as urban and semi-urban community settings. Another limitation is that this study applied HL questionnaire but not oral HL questionnaire due to unavailability of oral HL questionnaire that has been validated in the Thai contexts. Thus, an oral HL questionnaire should be developed and validated in Thailand.

Conclusion

Three informal occupation groups of informal workers in a district in North-eastern Thailand have different levels of HL as well as oral health behaviours. Thus, oral health promotion intervention should be tailored to meet HL needs of each group, especially general labourers. Findings of this study showed an association between HL domains and oral health behaviours, particularly regular dental visits. Thus, the HL questionnaire can be used as a simple screening tool at dental or community settings to help dental providers identify needs of their users in particular HL domains and to effectively support the oral health behavioural intervention designed by combining the social contexts with clinical care findings. Finally, a regular dental visit even without dental symptoms among the working age population should be promoted through various communication channels in order to create preventive oral health behaviour and enhance HL related oral health, especially in public health settings where dental clinics are located.

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