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Investigating predictors of self-care behaviour among homebound older adults: The role of self-efficacy, eHealth literacy, and perceived social support

Abstract

Purpose: This study aimed to investigate the predictors of self-care behaviour among homebound older adults using the Health Empowerment theory as a framework.

Design: This was a cross-sectional, predictive correlational study.

Methods: Sixty-eight participants were randomly selected from five Hong Kong community centres from 21 May 2020 through 20 July 2020. Self-care behaviours were assessed using the Chinese version of Partners in Health. Self-efficacy, eHealth literacy, and perceived social support were assessed as potential predictors of self-care behaviours. A multiple linear regression analysis was adopted to examine the predictive effects.

Results: The age of the sample ranged from 61 to 85 years (mean = 71.7, SD = 6.0). Participants who reported having sufficient or more than sufficient financial resources had better self-care behaviours than those who claimed to have insufficient financial resources ($F = 5.08, p = .009$). Statistically significant correlations were found between the participants' eHealth literacy ($r = .54, p\text{-value} = < .001$), perceived social support ($r = .60, p\text{-value} = < .001$), and self-care behaviours. eHealth literacy ($\beta = 0.13, p\text{-value} = .007$) and perceived social support ($\beta = 0.13, p\text{-value} = < .001$) were significant predictors of self-care behaviours. Collectively, the three variables accounted for 41% of the variances in self-care behaviours.

Conclusions: The findings in this study suggest that eHealth literacy and perceived social support are two key factors that predicted the self-care behaviours of this vulnerable population.

Clinical Relevance: In this technological era, the use of eHealth, together with enhanced social support, can lead to better self-care among older adults, particularly those who are homebound.

Key Words: Predictors, self-care, self-efficacy, eHealth, literacy, homebound

With the rapid growth of the ageing population, it is anticipated that the number of homebound older adults, defined as those aged 65 or older with physical, mental, or functional limitations that prevent them from leaving home (Sterling-Fox, 2019), will continue to rise (Xiang, Chen, & Kim, 2020). Homebound older adults not only suffer from multiple chronic diseases but also experience significant symptom distress, social isolation, and physical disabilities (Cheng, Batten, Cornwell, & Yao, 2020). The combination of these is especially detrimental and leads to elevated use of hospital services, and consequently has a profound impact on healthcare expenditures (Musich, Wang, Hawkins, & Yeh, 2015). To reduce the burden on the health and social systems and on tertiary care services, it is crucial that homebound older persons be able and willing to take responsibility for their own care.

Self-care is an independent, decision-making process involving protecting and maintaining one's own health through health promoting behaviours, lifestyle modifications, and disease prevention and management efforts (World Health Organization, 2020). Self-care is imperative to preserving the independence of homebound older adults and allowing for active and healthy ageing. There is evidence indicating that older adults who engage and adhere to self-care practices are more likely to maintain optimal functional status and quality of life, as well as

reduce their level of disability and use of healthcare services (Wong, Wong, Yeung, & Chang, 2018). However, performing self-care is a notable challenge for homebound older adults who have multiple co-morbidities and functional impairments. There is a scarcity of literature on how this vulnerable population exercises self-care and the associated factors. Exploring the self-care behaviours of homebound older adults and the associated factors can provide healthcare professionals with important information for designing an appropriate and effective intervention to promote self-care behaviours for this target group.

The Health Empowerment theory can provide a basis for understanding the factors that may affect the self-care behaviours of homebound older adults. Health empowerment is a process through which individuals gain full control over their health self-care decisions rather than being passive recipients of health services (Shearer, 2009). According to this theory, enhancing health empowerment requires identification and awareness of both personal resources and the social-contextual resources of the individual. Personal resources are unique characteristics of an individual that can influence their ability and willingness to adopt self-care behaviours, while social-contextual resources are essential to the health of an individual and can be built upon to promote and maintain self-care practices.

Among all personal resources, self-efficacy is one of the modifiable factors that is mentioned most often in relation to the self-care behaviour of older adults. Self-efficacy refers to the belief or confidence in one's ability to carry out self-care practices, including maintaining regular exercise and a healthy diet. Bandura (1998) stated that people with high level of self-efficacy will demonstrate great motivation to initiate a challenging task, deal with threats, anticipate eventual success, and persist until they succeed. Over the past few years, various studies have suggested that older adults with higher levels of self-efficacy have a higher quality of life

(Bowen et al., 2015), better physical functioning (Ory, et al., 2018), fewer depressive symptoms (Kim & Suh, 2017), and lower healthcare utilization (Yeom, 2014).

eHealth literacy is another personal resource that may affect self-care behaviours. With the emergence of technological innovations, people have a more convenient channel for communicating with family and friends, receiving online resources, and keeping track of global news without the need to leave home. Studies have found that mobile devices, such as smartphones and tablets, are especially useful to homebound older adults since these tools can provide a diverse array of both health and non-health online resources for them to manage their health and self-care problems, arrange for transportation, and maintain social connections (Choi & Dinitto, 2013). However, despite these advantages, surveys have reported that many older adults have low eHealth literacy and are not familiar with these new tools (Abrashkin et al., 2018; Census and Statistic Department, 2019). eHealth literacy is the ability of an individual to search for, understand, and appraise information from the Internet (Norman & Skinner, 2006). A high level of eHealth literacy is supposed to serve a literacy function, enabling older adults to properly apply the knowledge gained from the Internet to address and solve the difficulties that are encountered during self-care practices. There are studies exploring the correlation between the eHealth literacy levels and disease-related self-care behaviours among chronically ill patients (Cho & Ha, 2019; Guo, Hsing, Lin, & Lee, 2021). There is not much information about how eHealth literacy is associated with general self-care behaviours among homebound older adults.

As a social-contextual resource, perceived social support has been shown to have a high impact on the physical, functional, mental, and cognitive health of older adults (Courtin & Knapp, 2017; Donovan, et al., 2017; Shankar, McMunn, Demakakos, Hamer, & Steptoe, 2017). Perceived social support refers to how individuals perceive family, friends, and others as sources available

to provide informational, emotional, and financial support during times of need (Ioannou, Kassianos, & Symeou, 2019). Given that studies have consistently reported that perceived social support plays a crucial role in self-care behaviours among patients with chronic diseases including diabetes (Mohebi, et al., 2018), heart failure (Chamberlain, 2017), and hypertension (Osamor, 2015), it is important to examine whether this association is also present in homebound older adults.

In summary, previous studies have supported the proposition and provided evidence with regard to the relationship between among self-efficacy, eHealth literacy, perceived social support, and self-care behaviours among patients with specific chronic diseases. However, to the best of our knowledge, there is no study to date that examines the factors influencing the self-care behaviours of homebound older adults. Given their high medical burden and physical impairments, understanding the self-care behaviours of homebound older adults and their associated factors could assist healthcare professionals in developing and formulating educational plans and effective intervention programmes, which would help this vulnerable group of older adults live independently in the community for as long as they wish. The aim of this study was to examine the relationship between self-care behaviours and self-efficacy, eHealth literacy, and perceived social support among homebound older adults, and to examine the predictive effects of self-efficacy, eHealth literacy, and perceived social support on self-care behaviours among homebound older adults.

Methods

Design, Setting, and Sample

This study was a secondary analysis of data generated by a previous randomized controlled trial that examined the effects of a telecare case management programme for homebound older adults (Wong, Wong, Chow, & Wong, in press). A descriptive correlational design with a predictive approach was adopted in this study to investigate the correlation between self-efficacy, eHealth literacy, perceived social support, and self-care behaviours and to identify the key variables in predicting self-care behaviours among Hong Kong homebound older adults. Participants were randomly selected from five Hong Kong community centres during the period from 21 May 2020 through 20 July 2020. In this study, homebound older adults, defined as those who had gone outdoors less than once a week in the previous 6 months (Yao, Ritchie, Cornwell, & Leff, 2018), who resided within the community service areas were recruited. The selection criteria were: (1) aged 60 or over, and (2) a smartphone user. Homebound older adults who (1) had been diagnosed with dementia, (2) were unable to hear, see, or communicate, (3) were bed-bound, (4) had an active psychiatric illness for which they had recently been hospitalized within the previous 6 months, (5) were residing in an area with no Internet coverage, and (6) had been engaged in other telecare programmes, were excluded from the study. The sample size was determined by a power analysis for a multiple linear regression analysis. In order to achieve an effect size of 0.15 as recommended by Cohen (1988), a power of 80%, and a statistically significant level of .05, a minimum of 55 participants were required. The final sample size of this study was 68.

Instruments

Self-care behaviours

The self-care behaviours of the participants were assessed using the Chinese version of Partners in Health in Hong Kong (C-PIH HK). This 12-item scale was designed to measure the generic knowledge, behaviours, attitudes, and impacts relating to self-care. Each item was rated on a 9-point Likert scale, from 0 (very little, never, or not very well) to 8 (a lot, always, or very well). The total possible scores on this scale range from 0 to 96, with higher scores representing better self-care. There is a Hong Kong version of this scale, which has been shown to have good construct validity and internal consistency (Cronbach $\alpha = .845$). The test-retest reliability was high with ICC = .818.

Self-efficacy

The self-efficacy level of the participants was measured using the Chinese version of the General Self-efficacy Scale (CGSE). Schwarzer et al. (1997) first developed a 20-item German version of the GSE scale by using Bandura's social cognitive theory (Bandura, 1998). It was later shortened to 10 items for practical use and subsequently translated into Chinese (Zhang & Schwarzer, 1995). All 10 items in the Chinese version are rated on a 4-point Likert scale, with 1 = not at all true, 2 = hardly true, 3 = moderately true, and 4 = exactly true. The scores on the scale are summated. Total scores range from 10 to 40, with higher scores indicating greater self-efficacy (Leung & Leung, 2011). The scale was validated in a study involving 695 Chinese community-dwelling adults. High reliability was established, with alpha coefficients of 0.89 (Leung & Leung, 2011).

eHealth literacy

eHealth literacy among homebound older adults was assessed using the 8-item Chinese version of the eHealth Literacy Scale (C-eHEALS), with each item scored on a 5-point Likert scale of from 1 = strongly disagree to 5 = strongly agree (Koo, Norman, & Chang, 2012). This scale was developed to measure an individual's combined knowledge, comfort, and perceived skills at searching, evaluating, and adopting electronic health information to health problems. The final eHEALS score is the average of all 8 items, with higher scores suggesting higher eHealth literacy. While the eHEALS was originally validated with young adults, it has also been used to measure eHealth literacy among older adults (Xie, 2011). This scale was found to have good internal consistency, with Cronbach's alpha = .93 for both the younger (under the age of 60) group and the older adults (age 60 or over) group (Choi & DiNitto, 2013).

Perceived social support

The Chinese version of the Multidimensional Scale of Perceived Social Support (MSPSS-C) was used to measure the perceived social support among homebound older adults in this study (Chou, 2000). The 12-item MSPSS-C uses a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). The total possible score ranges from 12 to 84 (Zimet, Dahlem, Zimet, & Farley, 1988). The higher the score, the greater the amount of social support perceived by an individual. The MSPSS-C had excellent internal consistency, with Cronbach's alpha = .72. It also demonstrated good construct validity by showing a negative correlation with depression and anxiety as measured by the General Health Questionnaire and a positive correlation with perceived social support as assessed by the Lubben Social Network Scale (Chou, 2000).

The Socio-demographic Information Sheet

The socio-demographic information sheet was developed by the research team and adopted to measure the characteristics of homebound older adults, including their age, gender, marital status, cohabitation status, education level, and financial status.

Ethical considerations

Ethical approval was obtained from the Human Subjects Ethics Sub-Committee (HSESC) of the University prior to the commencement of the study. Information about the study was provided to all eligible participants. The prospective participants were given a written information sheet and a consent form to sign if they wished to participate. They were clearly informed that their participation was entirely voluntary and that they would experience no adverse consequences if they refused to join. Anonymity of personal information was maintained throughout the process and all data collected from the questionnaires were stored in a password-secured cabinet.

Data analysis

Two members of the research team entered the data independently into the SPSS software (version 26.0, IBM). No inconsistencies were found in the two files. Descriptive statistics were calculated, including the mean and standard deviation of self-efficacy, eHealth literacy, perceived social support, self-care behaviours, and their subscales. To examine the differences in self-care behaviours among different demographic subgroups of homebound older adults, an independent sample *t*-test, an analysis of variance, or a Pearson's product-moment correlation

coefficient was employed depending on the nature (i.e., categorical or continuous) of the demographic data. The level of significance was set at a p -value of less than .05.

A multiple linear regression analysis was adopted to examine the predictive effects of self-efficacy, eHealth literacy, and perceived social support on self-care behaviours, while controlling for the effects of the demographic variables (age, gender, marital status, education level, work status, financial status, and accommodation type). Prior to executing the analysis, assumptions of the absence of multi-collinearity, independence, normality, and the absence of outliers were tested. The results showed that the variance inflation factor (VIF) for each independent variable was between 1.03 and 1.46, and that the conditional index (CI) values were between 1.00 and 13.4 (i.e., a VIF value of greater than 10 and a CI value of less than 0.10 were used as cut-off criteria for multi-collinearity), suggesting that no multi-collinearity existed between these variables. Normality was confirmed by the studentized residual ($p = .91$). The assumption of independence was supported by a value of 1.78 for Durbin-Watson D . The absence of outliers was verified by the maximum value of 0.23 for Cook's D . The beta (β) standardized coefficient was also calculated to evaluate the strength of the relationship between each predictive variable and self-care behaviours.

Results

Sample characteristics

The age of the participants ranged from 61 to 85 years (mean = 71.7, SD = 6.0). More than 80% were females. Half of the participants were married. The majority (92.6%) had a primary level of education or above. Almost all of the participants claimed that they had sufficient or more than

sufficient financial resources (94.1%). About one-third lived alone (30.9%). Details are given in Table 1.

Socio-demographic data and its association with self-care behaviours

Table 1 provides the results of the bivariate analyses between self-care behaviours and different socio-demographic subgroups. No significant associations were found between self-care behaviours and socio-demographic subgroups except in financial status. Participants who reported having sufficient or more than sufficient financial resources had better self-care behaviours than those who claimed to have insufficient financial resources.

Correlations between self-efficacy, eHealth literacy, perceived social support, and self-care behaviours

Statistically significant correlations were found between the participants' eHealth literacy ($r = .54$, p -value = $< .001$), perceived social support ($r = .60$, p -value = $< .001$) and self-care behaviours. No statistically significant correlation was identified between self-efficacy and self-care behaviours. Details are given in Table 2.

Predictions of self-care behaviours by self-efficacy, eHealth literacy, perceived social support

Table 3 illustrates the findings of the multiple regression analysis. Three independent variables, namely self-efficacy, eHealth literacy, and perceived social support, were incorporated into the

regression model. Among these, eHealth literacy ($\beta = 0.13$, p -value = .007) and perceived social support ($\beta = 0.13$, p -value = <.001) were significant predictors of self-care behaviours.

Collectively, the three variables accounted for 41% of the variances in self-care behaviours.

Discussion

Overall, a statistically significant correlation was found between eHealth literacy, perceived social support, and self-care behaviours. Demographically, participants with better financial status reported better self-care behaviours. Additionally, eHealth literacy and perceived social support but not self-efficacy were identified as significant predictors of self-care behaviours among homebound older adults.

The current study highlighted eHealth literacy as a predictor of self-care behaviours among homebound older persons. Previous studies have observed a significant correlation between eHealth literacy and self-care behaviours among adults living with type 2 diabetes mellitus (Guo et al., 2021), the general adult population in Japan (Mitsutake, Shibata, Ishii, & Oka, 2016) and Korea (Kim & Son, 2017), and college students (Hsu, Chiang, & Yang, 2014). In fact, one study identified eHealth as the strongest predictor of health outcomes after adjusting for general characteristics among non-homebound Korean adults (Kim & Son, 2017), which may be related to the fact that higher levels of eHealth literacy as a personal resource may facilitate health-related decisions, autonomy, and participation in healthy behaviours (Werts & Hutton-Rogers, 2013). Thus, eHealth literacy should be targeted in health promotion activities, such as by offering training workshops to homebound older adults and their informal caregivers (Kim &

Son, 2017). Older persons should be involved in designing these eHealth literacy programmes to motivate them to embrace its use through demonstrations and ongoing education.

Similarly, in studies exploring the relationship between perceived social support and self-care behaviours a statistically significant relationship has been noted among persons with type 2 diabetes mellitus (Mohebi et al., 2018) and heart failure (Alizadeh, Ashktorab, NIKRAVAN, & Zayeri, 2014; Chamberlain, 2017). Perceived social support may also improve the physical, functional, and mental wellbeing of older adults (Courtin & Knapp, 2017; Donovan et al., 2017; Shankar et al., 2017). In addition to the role that it plays among non-homebound older adults, it was observed in the current study that perceived social support predicted self-care behaviours among homebound older persons. Thus, perceived social support may be a significant social-contextual resource not only for non-homebound adults, but also for homebound older adults, which warrants further attention.

Another finding worth mentioning is the fact that no statistically significant correlation was found between self-efficacy (a personal resource) and self-care behaviours. This finding might be related to the small size of the sample or to the relatively low baseline self-efficacy scores of the participants. A recent systematic review (n = 22 studies) examining the association between self-efficacy and self-care among persons with essential hypertension noted that 21 studies observed that higher self-efficacy was associated with engagement in self-care behaviours including medication adherence, engagement in physical activity, and dietary changes (Tan, Oka, Dambha-Miller, & Tan, 2021). However, the authors cautioned that the evidence supporting this association was of low to medium quality and was limited by heterogeneity, giving rise to a need for more longitudinal studies to examine the relationship (Tan et al., 2021). The findings of the current study support this argument and offer directions for further research.

Further to the above, the demographic data revealed that participants who reported having sufficient or more than sufficient financial resources had better self-care behaviours than those who claimed to have insufficient financial resources. Financial burden can often generate worry and anxiety, adversely affect participation in self-care behaviours, and lead to complications, especially among homebound older adults (Sina, Graffy, & Simmons, 2018). Thus, geriatric and community health nurses need to pay attention to elderly persons who may have financial challenges and refer them to social welfare services as and when appropriate. Additionally, innovative healthcare financing measures and welfare schemes are required to support homebound elderly persons in this regard. eHealth interventions should also be cost-effective so as not to impose an undue financial burden on older persons and their families.

The strength of this study was the adoption of a theory to guide the research. The Health Empowerment theory provided insights on how both the personal resources and social-contextual resources of homebound older adults affect their self-care behaviours. The results of this study can also reflect and confirm the application of this theory in this understudied population. However, this study was not without limitations. First, the size of the sample in this study was relatively small, although based on the power analysis it was not under-powered for the multiple linear regression analysis. Second, although the three variables selected in this study were based on the theory, there might have been other important factors that influenced the self-care behaviours of these homebound older adults, which can be explained by the fact that 59% of the variances in self-care behaviours were not explained. Even so, including more variables in this study would have required a larger sample size to obtain sufficient power (Jan & Shieh, 2019).

Conclusions

Supporting self-care behaviours is essential to preserving the independence of the homebound older adults and achieving active and healthy ageing. The findings in this study suggest that eHealth literacy and perceived social support are two key factors that predict the self-care behaviours of this vulnerable population. Consequently, this study will contribute to clinical applications and provide a foundation for future studies on developing educational programmes to elevate the eHealth literacy of both homebound older adults and their families. This will increase the self-care behaviours of homebound older adults and improve their overall quality of life.

Clinical Resource

World Health Organization website:

https://applications.emro.who.int/dsaf/EMROPUB_2015_EN_1901.pdf?ua=1.

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