

QUANTITATIVE STUDIES

Factors influencing sexual activity among patients with heart failure in Thailand

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 <https://doi.org/10.31603/jhns.v13i1.14543>

Article journey

Submitted

17/8/2025

Revised

20/11/2025

Accepted

9/12/2025

Online first

12/3/2026



Abstract

In patients with heart failure (HF), sexual activity (SA) is influenced by physiological, psychological, and relational factors. These issues are often overlooked, despite the significant impact they have on quality of life. Research on this topic is extensive worldwide, however there remains a significant lack of data specifically focused on the Thai population. Moreover, sexual health is an underreported problem in patients with HF, necessitating the identification of predictors of SA to develop the best nursing care. Addressing this gap is important, as establishing a clear baseline in Thailand can serve as a vital reference point for developing further studies conducted within and outside of Asia. Therefore, the study aimed to identify predictors of SA among patients with HF, specifically metabolic equivalents (METs), age, mental health, and partner communication. The study used a cross-sectional observational design, recruiting a sample of 144 married Thai patients with HF from two tertiary care facilities. Data was collected between August and October 2024. Participants completed questionnaires on demographics, METs (Duke Activity Status Index), mental health status (DASS-21), and partner communication (Dyadic Sexual Communication Scale). Before beginning the research, all instruments were validated and assessed for reliability using appropriate psychometric methods. Binary logistic regression was used to analyze the predictive value of variables. The finding indicated that most participants reported fewer and shorter episodes of SA on a daily basis. Furthermore, they also identified a lack of professional guidance during this period. Significant predictors of SA included lower METs (OR=0.362), depression (OR=0.002), and effective partner communication (OR=1.156). Age, anxiety, and stress were not significant predictors of the outcome. The study concludes that lower METs, higher levels of depression, and effective partner communication are associated with reduced SA. Given the impact of METs and mental health, it is essential for nurses to integrate physical activity assessments and mental health screenings into HF care protocols.

Keywords: Aging, heart failure, mental health status, metabolic equivalents, partner communication, sexual activity

Introduction

Heart failure (HF) constitutes a considerable global health challenge within the continuum of cardiovascular disorders, impacting an estimated 64 million individuals across the globe (Savarese et al., 2023). Patients with HF in Asia tend to be marginally younger than their European and American counterparts, mirroring the overall younger population demographics prevalent in these regions (Feng et al., 2024). In Thailand, the proportion of HF rehospitalizations versus hospitalizations in patients with HF was 22.7% in 2018 and 23.9% in 2019 (Jiampo et al., 2024). HF is a complex clinical syndrome characterized by symptoms and signs resulting from any structural or functional impairment of ventricular filling or ejection of blood (Heidenreich et al., 2022). The clinical condition leads to inadequate oxygen supply, dyspnea, fatigue, and reduced exercise capacity (Ahmad et al., 2024). These complications influence functional capacity, including sexual activity (SA) (Carella et al., 2023). This influence is ascribed to the pathology of the disease, the various treatment modalities, disease severity, psychological factors and social dimension (e.g., sexual communication) (Da Silva et al., 2022; Celano et al., 2018; East et al., 2021). SA is often compromised in individuals suffering from HF because of the underlying pathophysiological mechanisms of the condition and its associated therapeutic interventions. Patients commonly express experiences of diminished sexual efficacy reduced levels of pleasure and satisfaction, a decline in libido, and a lower frequency of sexual interactions (Jaarsma, 2017). Moreover, there is widespread apprehension regarding the exacerbation of symptoms during sexual engagement, such as dyspnea and apnea, which is further intensified by concerns related to potential mortality (Corradetti et al., 2022). Additionally, the adverse effects of specific

HF pharmacotherapies on sexual performance require patients to adjust medication with healthcare professional (Chen et al., 2019).

SA is classified as a form of physical activity (PA) that requires an energy expenditure typically ranging from 3 to 5 Metabolic Equivalents (METs), leading to transient changes across the cardiovascular, ventilatory, and circulatory systems (Teng et al., 2024; Oliva-Lozano et al., 2022). METs have emerged as crucial predictors of sexual function in patients with cardiovascular disease (Jaarsma, 2014). The cornerstone of sexual limitation in HF is the physiological constraint imposed by functional capacity. For patients with advanced HF (NYHA Class III/IV), this energy demand exceeds their cardiorespiratory reserve, leading to dyspnea and fatigue (Levine et al., 2012). Specifically, individuals with HF with an exercise capacity of approximately 2.8 METs show marked impairment in sexual function (Jaarsma, 2017). Furthermore, lower VO₂ peak values are consistent with the prognostic value of the degree of congestion and severity of HF (Puttini et al., 2025). This physiological barrier limits physical activity and engenders a fear of exertion, contributing to sexual cessation and avoidance. Extensive literature supports the notion that advancing age is a significant determinant in the development of cardiovascular disease (Zhou et al., 2022; Rodgers et al., 2019). However, there is a trend toward an increasing incidence in younger individuals (Groenewegen et al., 2020). The prevalence of erectile dysfunction (ED) is positively correlated with age, rising from 10% among 40-year-olds to 79% by age 80 (Pellegrino et al., 2023). In women, the menopausal transition associated with aging can influence sexual function (McCool-Myers et al., 2018).

Mental health issues including depression, anxiety, and stress are highly prevalent in individuals with HF and often surpass the rates reported in the general population (Tsabedze et al., 2021). These psychological conditions contribute to sexual dysfunction. For instance, anxiety has been linked to erectile difficulties in men (Liu et al., 2018), diminished sexual desire or arousal in women (Nappi et al., 2016), and decreasing the likelihood of sexual resumption with their partners (Hoekstra et al., 2012). Depression is similarly implicated, often correlating with reduced SA due to its detrimental impact on desire, arousal, and relational intimacy (Liu et al., 2018). Moreover, effective dyadic sexual communication has been shown to play a pivotal role in maintaining SA among patients with HF (Dongpho & Ua-Kit, 2014). High-quality communication enables discussions about sexual needs and boundaries, promoting mutual understanding and enhancing sexual satisfaction. The interplay of these physiological and psychological variables is shaped and often exacerbated by the prevailing socio-cultural and clinical context in Thailand. This context creates unique barriers that necessitate focused research. Sexual health concerns remain underreported in Thailand, primarily due to cultural sensitivities and significant communication barriers (Rittirong et al., 2023). Many patients feel reluctant to discuss intimate matters with partners or healthcare providers, constrained by norms and stigmas (Kucukkaya & Gonenc, 2023). Compounding this issue, healthcare professionals often receive inadequate training to address sexual health effectively.

For patients with HF in Thailand, this communication gap is very important. Although 66.1% of participants expressed a desire for counseling, only 20% had previously received it (Rittirong et al., 2023). Research in this specific population is scarce (Dongpho & Ua-Kit, 2014); however, existing evidence suggests the presence of clear physical and psychological barriers. These include reduced METs capacity and cardiac anxiety, which are exacerbated by suboptimal Cardiac Rehabilitation access outside major urban centers (Kotchaoen et al., 2024). Moreover, the rationalization of decreased sexual activity in the 50s as a result of lower female desire reflects socio-cultural aging norms; consequently, couples may redefine their relationships through spiritual or companionate lenses (Ford & Chamrathirong, 2012). In the high-stakes cardiology setting, the primary clinical focus is on managing acute physical symptoms and optimizing medical therapy (Chirakarnjanakorn et al., 2023). Consequently, systematic screening for crucial mental health comorbidities, such as depression and anxiety, is frequently not routine in HF clinics. This systemic oversight presents a critical knowledge gap, impeding the delivery of comprehensive care. This study, therefore, seeks to explore the factors influencing SA in Thai patients with HF, addressing a vital yet overlooked component of holistic health.

Method

The study used a descriptive and predictive cross-sectional design to establish foundational evidence on sexual activity among patients with HF in Thailand. This research design is highly suitable for determining the prevalence, characteristics, and patient-reported frequency of SA before developing further nursing interventions. Moreover, this approach was chosen as a critical first step to generate local evidence in the field. Identifying predictors (e.g., depression and communication) within the Thai context is a prerequisite for designing subsequent, appropriate, and interventional research in the future. The source population consisted of an average of 340 heart failure patients during the study period across both study sites, with 60% from Ramathibodi Hospital and 40% from Police General Hospital, refers from total population each site. Following the application of inclusion criteria, 150 patients were identified as eligible (90 from

Ramathibodi and 60 from Police hospital). After accounting for a total of 5 dropouts (4 from Ramathibodi and 1 from Police General Hospital), the final analysis was conducted on the remaining 144 participants. This research ensured internal validity by utilizing purposive sampling at two Bangkok tertiary hospitals, specifically targeting outpatients to maintain a consistent clinical setting. Limiting the scope to major metropolitan tertiary centers guarantees that all participants receive a comparable standard of care, including specialized services and guideline-directed medical therapy (GDMT). Such standardization is essential to control for clinical confounders (e.g., varying treatment protocols) that could potentially skew the METs data. The research team defined inclusion and exclusion criteria to obtain a suitable sample that effectively meets the research objectives. The inclusion criteria were age ≥ 18 years, The New York Heart Association (NYHA) functional class I or II, peripheral oxygen saturation $\geq 95\%$, being married, and proficiency in both written and spoken Thai. For participants aged ≥ 60 years, cognitive impairment was assessed using the Thai 6-Item Cognitive Impairment Test (6-CIT), requiring a score of ≤ 7 Aree-Ue & Youngcharoen, 2020). On the other hand, the exclusion criteria consisted of received treatment with specialized cardiac devices such as pacemakers, Ventricular Assist Devices (VADs) or transplantation, pre-existing medical conditions compromising sexual function (e.g., cerebrovascular disease, spinal cord injury, end-stage renal disease, cancer), diagnosed psychiatric disorders (e.g., schizophrenia, depressive disorders), HF diagnosis less than six months prior, or acute symptomatic exacerbations at enrollment. The immediate post-event period: 0–6 months is often characterized by acute adjustment disorders or transient distress. With selecting patients beyond this window, we aim to capture the chronic psychological state and quality of life, rather than the acute emotional response to a recent life-threatening event or new diagnosis. The sample size was determined using standard assumptions for logistic regression (Stevens, 1996). Applying the formula $N \geq 30p$ —where N is the required sample size and p is the number of independent variables ($p=4$)—a minimum of 120 participants was required to ensure adequate statistical power. To account for potential attrition and incomplete data, this target was increased by 20% (Burmeister & Aitken, 2012), resulting in a final sample of 144 participants to enhance the study's reliability and robustness.

The research utilized a two-part instrument set comprising screening and data collection tools. The screening instruments used the 6-CIT (Brooke & Bullock, 1999) which translated into Thai Version (Aree-Ue & Youngcharoen, 2020). The instrument assesses cognitive domains, including orientation, attention, and memory, specifically in individuals aged 60 and above. This instrument consists of 6 items or questions. Scores range from 0–28, with a cutoff score of ≤ 7 indicating no cognitive impairment. Participants scoring 8 or above were classified as having suspected cognitive impairment. The 6-CIT shows strong diagnostic validity for dementia screening ($r=-0.91$, 78.57% sensitivity, 100% specificity) (Brooke & Bullock, 1999). The Thai version has also been validated, showing a moderate negative correlation with both the Mini-Cog and the original English 6-CIT ($r_s=-0.42$, $p<0.001$) and good test-retest reliability ($r_s=0.64$, $p<0.001$), confirming its suitability for cognitive screening in the Thai population (Aree-Ue & Youngcharoen, 2020). Meanwhile, the data collection instrument consists of a patient personal data form, developed by the authors through a review of existing research. The instrument consists of two sections. Section 1 includes nine participant-completed items such as age, gender, menopause (in females), religion, smoking habits, income, SA engagement, receipt of SA-related healthcare information, and symptom burden during the prior two weeks. Item 9 in section 1 served as the criterion variable for SA. This item asked, “after being diagnosed with HF, did you continue to have sexual activities with your partner?” with response options such as 1) No/abstain from sexual activities after diagnosis, 2) continue sexual activities but with reduced frequency/duration, and 3) continue sexual activities as usual. For analytical purposes, these responses were recoded into two categories: (1) the group reported sexual activity as usual/abstain, and (2) the group reported reduced frequency and duration, facilitating dichotomous analysis of SA patterns postdiagnosis. Moving on to section 2, the data for this section was obtained via medical record review. The researcher recorded six items, including comorbidities, duration of HF, left ventricular ejection fraction (LVEF), NYHA classification, and a comprehensive list of prescribed medications.

Other data collection instruments include the Duke Activity Status Index (DASI) which is known as a 12-item self-report physical activity questionnaire used to determine an individual's functional capacity (Hlatky et al., 1989). The 12 items of the DASI represent a hierarchical range of physical exertion, spanning personal care, ambulation, household tasks, sexual function, and recreational activities. Each item is weighted based on the METs associated with that specific activity, providing a validated surrogate for peak oxygen consumption and overall functional status in patients with chronic cardiovascular conditions. This tool has been adapted into a Thai version that demonstrates strong content validity (80%) and internal consistency ($\alpha=0.80$) (Namphonkrang, 2004). The tool categorizes activities into ten graded levels, with weighted scores ranging from 1.75 to 8.00, convertible to METs. In this study, the reliability is $\alpha=0.77$. To ensure the tool was suitable for this population, Cronbach's alpha was calculated for the 30 study participants,

confirming the reliability of the scale for heart failure participants. Existing research has frequently applied this tool, with examples including studies validated 12-item instrument used to assess functional capacity and quality of life in heart failure populations (Madujibeya et al., 2023; Wu et al., 2016). By converting physical activity into metabolic equivalents, the DASI effectively stratifies clinical risk. Specifically, a cut-point of ≥ 19 distinguishes between good and poor functional capacity (Madujibeya et al., 2023), while a threshold of ≤ 23 serves as a robust predictor of 36-month mortality (Santos-de-Araujo et al., 2024). Higher scores consistently correlate with superior functional status and improved clinical outcomes in chronic heart failure patients. The subsequent instrument utilized is the Depression Anxiety Stress Scale-21 (DASS-21) for mental health status. The tool is a 21-item self-report instrument assessing depression, anxiety, and stress based on weekly experiences (Lovibond & Lovibond, 1995). In practice, the tool uses a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time), with higher scores indicating greater depression, anxiety, and stress. For the purpose of dichotomous analysis, participants' scores on subscales of the DASS-21 were categorized. Scores exceeding 4 for depression, 3 for anxiety, 7 for stress and were classified as group "sense", while scores at or below were categorized as group "not sense", based on established cutoff scores. Moreover, the tool demonstrates excellent internal consistency, with Cronbach's alpha values of 0.91 for the depression subscale, 0.84 for the anxiety subscale, and 0.90 for the stress subscale. The DASS-21 has demonstrated excellent internal consistency, with Cronbach's alpha coefficients reported at 0.91 for depression, 0.84 for anxiety, and 0.90 for stress (Lovibond & Lovibond, 1995). The Thai version of the DASS-21, adapted and validated by (Ratanasiripong et al., 2020), also shows robust psychometric properties in Thai populations, with alpha values ranging from 0.78 to 0.85 across all subscales, confirming its reliability for assessing psychological distress in clinical settings.

The last instrument employed in this research is the Dyadic Sexual Communication Scale (DSC) which is acknowledged as a self-report instrument assessing sexual communication quality in partnerships (Catania, 2011). The tool operationalizes partner communication by measuring the quality and frequency of communication specifically related to the couple's sexual life and associated feelings (Galizia et al., 2023). This scale transcends general spousal communication to focus on the intimate, relational criteria that are relevant to sexual activity in a chronic illness context. The criteria within the DSC focus on key communication behaviors such as openness and ease in discussing sexual needs or problems, emotional support and responsiveness during these discussions, and the frequency and comfort of initiating conversations about sex. Scores 13–78 reflect the quality of communication. The original DSC exhibits strong psychometric properties, including good internal consistency ($\alpha=0.87$) (Catania, 2011). The Thai adaptation demonstrates similar robustness ($\alpha=0.76$, $r=0.96$) (Oeychanai et al., 2021). In this study, the tool's overall reliability was confirmed, with an alpha value of 0.86. In this study, a pilot study of 30 participants, the instrument demonstrated high internal consistency, yielding a Cronbach's alpha coefficient of 0.86. Data collection occurred from August to October 2024. All the process was conducted by the researcher and the team. Eligible patients from two Bangkok tertiary hospitals were identified via medical records, adhering to inclusion and exclusion criteria, with older adults undergoing 6-CIT cognitive screening. Consenting participants completed self-administered questionnaires, including Personal Data Record, DASI, DASS-21, and DSC, in approximately 30 minutes. Accommodations for visual impairment ensured inclusivity. Data were then reviewed for completeness at the end of the process. Data collection was conducted through direct communication with the participants to confirm the authenticity of self-reported outcomes; caregivers were not involved in the response process. All assessments took place at the hospital during scheduled follow-up appointments, specifically during the waiting periods immediately before or after the patients' consultations with their physicians.

Data accuracy was verified before analysis, which was conducted via the Statistical Package for the Social Sciences (SPSS) for Windows version 29 under a licensed agreement with Mahidol University, Thailand. Descriptive statistics summarized participants' demographic and clinical characteristics, including frequencies, percentages, ranges, means, median, and standard deviations. Additionally, to evaluate the primary study variables, mean scores, median scores, standard deviations, and the percentage of average scores relative to the maximum possible scores were calculated for age, METs, mental health status, and partner communication among participants with HF. Binary logistic regression analysis was conducted via the enter method to assess the predictive capacity of four independent variables—age, METs, mental health status, and partner communication for the presence of SA among participants. Before performing the regression, preliminary assumption testing was carried out to ensure that the data met the requirements for logistic regression analysis. The significance level was considered at 0.05 for hypothesis testing.

Ethical approval and institutional permissions were obtained prior to recruitment. The study was conducted in accordance with the Declaration of Helsinki and approved by the Human Research Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University (COA No. MURA2024/412, June 15, 2024) and the Human Research Ethics Committee of Police general hospital (No.0036.ศจจ(พจ)/112, July 17, 2024). Research ethic principles were strictly

maintained during the data gathering process for the study. The study adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (Version 4) checklist for enhancing the methodological rigor of the observational studies.

Results

The participants ranged in age from 35-79 years, with a mean age of 61.47 years (SD=8.87). The majority of the cohort were male (70.1%), and among the female participants, 81.4% were postmenopausal. Most participants identified as Buddhist (93.1%). A significant portion of the cohort (89.6%) reported maintaining SA with their partners, although many noted a reduction in frequency or duration. Even so, a striking majority (96.5%) reported never having received any information on safe SA from healthcare providers, and 40.3% expressed a desire for more guidance on the topic (**Table 1**). The clinical profile of the 144 patients revealed hypertension as the most prevalent comorbidities (52.1%). Other comorbid conditions were reported, but none of the participants presented with anemia. The most commonly experienced symptom within the cohort was musculoskeletal pain, reported by 50.0% of the participants. With respect to HF classification, Heart Failure with Reduced Ejection Fraction (HFrEF) phenotype was the most common, representing 35.2% of cases. Most participants (46.4%) had been living with HF for two to five years, with NYHA functional class I, indicating mild symptoms. Beta-blockers were the most frequently prescribed medications for HF management and were used by 81.3% of the cohort. VO_2 peak values ranged from 19.58 to 34.63 mL/kg/min, with a mean of 28.42 (SD=5.49), reflecting varying exercise tolerance levels across the participants (**Table 2**). METs scores of patients ranged from 5.59 to 9.89, with a mean of 8.12 (SD=1.57), indicating moderate physical activity capacity. In terms of mental health status, the mean scores were depression 0.76 (SD=1.36; range 0–10), anxiety=1.50 (SD=1.99; range 0–13), and stress=2.09 (SD=2.42; range 0–11), suggesting a relatively low average mental health status across the sample. The mean score for partner communication was 40.81 (SD=7.00), with scores ranging from 28 to 66, indicating moderate levels of sexual communication within relationships (**Table 3**).

For binary logistic regression analysis, variables were categorized. Age was dichotomized into two groups, and mental health status variables were classified as either "sense" or "nonsense" based on established clinical cutoff scores. In terms of SA patterns, no participants reported complete abstinence from SA following their HF diagnosis (**Table 4**). The result presents the binary logistic regression analysis, which indicate that the study variables can explain 35.2% of the variance in SA outcomes, as indicated by the Nagelkerke R^2 value of 0.352. The model achieved a 91.7% correct prediction rate, indicating strong performance. The Hosmer–Lemeshow test yielded a nonsignificant result ($\chi^2=12.261$, $p=0.140$), confirming that the model adequately fit the data. After adjusting for all variables, three predictors were found to significantly influence the likelihood of decreased SA such as METs, depression, and partner communication. These findings indicate that lower physical capacity, greater depressive symptoms, and better sexual communication are significantly associated with decreased SA. However, in the case of partner communication, the interpretation may suggest nuanced relational dynamics warranting further exploration. In contrast, age, anxiety, and stress were not significant predictors of changes in SA (**Table 5**).

Discussion

The study highlighted that the model indicates a substantial portion of the variance in sexual activity was explained. Given the limited existing research in Thailand on the topic, exploring these determinants is an important direction to develop a comprehensive understanding of sexual health in patients with HF. Consistent with prior research on cardiovascular populations, the persistent yet diminished intensity of SA reported by most participants likely reflects the impact of advanced age and comorbidities (Li et al., 2020; Scavello et al., 2019). The findings may also be attributed to cultural factors. To be more specific, Thai Buddhist beliefs often frame aging and illness as periods for sexual abstinence, where continued sexual expression is viewed as inappropriate or inconsistent with the sick role (Wattanapansak et al., 2014). Of concern, the lack of professional guidance is stark with 96.5% of participants reporting no prior counseling on safe sexual practices. With 40.3% of respondents actively seeking this information, there is a clear educational void that may perpetuate anxiety surrounding the resumption of SA (Jaarsma, 2017; Baert et al., 2019). Hence, there is a pressing need for interventions that support couples in their sexual decision-making (Bafrani et al., 2023). This is especially critical given that SA encompasses a broad range of behaviors outside sexual intercourse alone (Cameron & Santos-Iglesias, 2024). In chronic illness context, maintaining these non-coital aspects of sexuality can be as vital as physical sexual performance (Penhollow, 2024). These behaviors serve as meaningful alternatives that preserve relational intimacy while respecting the patient's physical limitations. This underscores the importance of reframing sexual health within a more inclusive context when counseling patient and their partners (Bond & Radix, 2024). Partner communication was the most

influential predictor of decreased SA in the study. This result indicates that increased dialogue occurs as couples negotiate changes in their sexual lives necessitated by HF symptoms or treatment side effects (Piegza et al., 2025). Open communication enables couples to redefine sexual norms and engage in shared decision-making to address their concerns (Wasson & Rehman, 2025; Mallory et al., 2019; Jones et al., 2018).

Although it strengthens intimacy, open communication can result in a collaborative choice to restrict SA when patients or partners experience discomfort, worsening symptoms, or distress (Klompstra et al., 2025). The findings regarding SA in this population must be interpreted within the unique Thai sociocultural context. Within this framework, a pervasive stigma surrounding sexuality influences both patient behavior and their chosen coping strategies (Wainberg et al., 2016; Shamrock et al., 2024). Furthermore, the prevailing influence of Buddhism and cultural conservatism in Thailand creates a substantial barrier to open communication about intimate matters. Such cultural stigma discourages patients from addressing sexual needs or physical decline with their families or healthcare team (Bohren et al., 2022). The stigma leads patients to adopt avoidant strategies when addressing their sexual health concerns. A study highlighted that engaging more in temple life helps patients navigate the transition of aging by providing a spiritually meaningful alternative to physical intimacy (Ford & Chamrathirong, 2012). Though religion is beneficial to positive health behaviors, the spiritual shift allows couples to avoid the difficult conversation about sexual needs or functional decline caused by HF. This pattern is reinforced by collectivist norms in Thailand, which are influenced by family roles, gender expectations, and religious values, all of which discourage direct conversations about sexuality (Falgares et al., 2024). Thus, the method of expressing intimacy is often adapted to noncoital behaviors such as hugging or emotional closeness, which are both acceptable and less physically demanding for patients with HF. The dynamic of avoidance through substitution and noncoital intimacy highlights a crucial difference from patterns observed in more individualistic Western cultures (Mallory et al., 2022).

In Western countries, sexual rehabilitation is an explicit component of cardiac rehabilitation, driven by an emphasis on open disclosure and addressing physical needs directly (Koenders et al., 2025). The deep-rooted stigma in Thailand likely limits open communication regarding sexual initiation, adaptation, and satisfaction. Therefore, nurses are essential in developing care that recognize both spiritual substitution and the barriers to starting conversations on sexual health. The observed association between increased partner communication and decreased SA may reflect the cultural framework. From the perspective of instrument usage, the DSC scale may not adequately capture or differentiate communication pertaining to affectionate expressions, emotional intimacy, or discussions around non-coital intimate behaviors. In light of this, the instruments require more cultural adaptation for the Thai context and population. In addition to linguistic adaptation, this means adapting them to capture forms of non-coital intimacy and affection which are often prioritized among older adults with partners or healthcare providers. The study recognizes this as a limitation and a vital direction for future research in developing relevant measurement tools. This could explain why improved communication did not predict increased SA. METs emerged as the second most significant predictor of decreased SA in patients with HF. This suggests that individuals with greater physical capacity, indicating that greater physical capacity correlates with maintained sexual engagement. METs are indirect indicators of a patient's ability to perform physical tasks including SA (Oliva-Lozano et al., 2022). Therefore, higher METs values indicate better cardiovascular fitness, greater confidence, and safety in sexual intimacy. The findings underline the clinical utility of assessing functional capacity via METs in HF management. A study supported that patient with heart disease can safely engage in SA when their condition is stable and well-managed, particularly those with METs of 3–5 and no significant cardiovascular compromise (Jelavic et al., 2018; Jaarsma et al., 2021). Our results support this, as the sample's high MET scores and NYHA Class I/II status indicate mild symptoms with minimal impact on daily functioning. The participants are more physically capable and confident in resuming SA. A study reported that individuals in NYHA I and II exhibit heightened illness awareness, which may increase acceptance of their diagnosis and facilitate the maintenance of sexual intimacy (Obieglo et al., 2017).

The study found a counterintuitive link between depression and SA. Although depression was a significant factor, individuals with depression showed a 0.002-fold reduction in the odds of reporting decreased SA, indicating a protective or divergent trend compared to individual without depression. This contrasts with extensive literature demonstrating depression's typical impairment of sexual functioning. For instance, study reported depressive symptoms in patient with HF linked to sexual dysfunction and decreased quality of life (Stein et al., 2016). Moreover, another study described a bidirectional link between depression and erectile dysfunction (Xiao et al., 2023). SA might be a protective factor against depression in some population of interest (Chen et al., 2025). The anomalous finding here is likely due to the disproportionately small number of participants with depression (n=3) versus participants without depression (n=141), potentially skewing statistical analysis. Furthermore, 88.89% of participants without depression still reported reduced

SA, supporting the multifactorial nature of SA decline in HF. Thus, the limited sample size of the participants with depression restricts interpretability, necessitating cautious interpretation and further investigation. During data analysis, age was not a significant predictor of decreased SA in this study. These findings suggest that age alone may not fully explain SA variations when METs, partner communication, and depression are considered. Although evidence of age-related sexual dysfunction in cardiovascular patients (Melese et al., 2024) and increased difficulties among post-menopausal women (Kucukkaya & Gonenc, 2023), the study found no significant difference in SA between the 18–60 and >60 age groups. In men, a gradual decline in testosterone—often referred to as andropause—typically begins between the ages of 20 and 30 and continues throughout the lifespan (Pataky et al., 2021). The comparable age distribution (41.67% vs. 58.33%) suggests that most participants were already experiencing the lifelong decline of testosterone. Because these hormonal changes had already commenced for both groups, SA remained relatively uniform, potentially accounting for why age failed to significantly predict sexual activity in this study. While disease progression typically correlates with greater sexual decline in older populations (Da Silva et al., 2022; Steinke et al., 2018), our findings revealed that decreased SA was nearly universal across the sample, affecting 86.67% of younger participants and 91.67% of those over 60. Although psychological and relational health can buffer age-related decline (McCabe et al., 2016), the high prevalence of decreased SA across our sample suggests a different driver. Specifically, the impact of HF and associated comorbidities appears to outweigh the influence of age, even among the younger demographic (13.19% under age 50).

Table 1. Descriptive data of personal information.

Variables	Frequency (n)	Percentage (%)
Age groups (Years) / Range=35-79, Mean (SD)=61.47 (8.87)		
18 – 60	60	41.6
>60	84	58.4
Age (Years) by gender		
Male / Range=35-79, Mean (SD)=61.34 (9.12)	101	70.1
Female / Range=40-77, Mean (SD)=61.79 (8.34)	43	29.9
Menopause		
Menopause	35	81.4
Premenopausal	8	18.6
Religious		
Buddhism	134	93.1
Islam	8	5.6
Christianity	2	1.4
Smoking behaviors		
Never smoking	77	53.5
Quit smoking	55	38.2
Still smoking	12	8.3
Income level		
Sufficient and with savings	67	46.5
Sufficient but no savings	47	32.6
No income	30	20.8
SA with a partner		
Reduced for the duration and frequency	129	89.6
Regular for the duration or frequency	15	10.4
Received information about SA		
Never receiving	139	96.5
Desire information	58	40.3
Do not desire information	81	56.3
Previously received information from healthcare personnel	5	3.5
Medications affecting SA	4	2.8
The appropriate frequency and duration of SA	1	0.7

Table 2. Descriptive data of health information.

Variables	Frequency (n)	Percentage (%)
Comorbidities		
Hypertension	75	52.1
Dyslipidemia	72	50.0
Diabetes	68	47.2
Coronary artery disease	50	34.7
Cardiomyopathy	39	27.1
Brady-tachy arrhythmia	37	25.7
Valvular heart disease	26	18.1
Chronic kidney disease stage I-IV	22	15.3
Gout	12	8.3
Respiratory disease	7	4.9
Benign prostatic hyperplasia	5	3.5
Thyroid disease	3	2.1
Myocarditis	2	1.4
No comorbidity	4	2.8
Symptom burden		
Musculoskeletal pain	72	50.0
Sleep disturbances	51	35.4
Fatigue	46	31.9
Constipation	36	25
Dyspnea	35	24.3
Poor appetite	18	12.5
Nausea and vomiting	14	9.7
Weight loss	12	8.3
No symptom	27	18.8
Duration of HF / Range=1-30, Mean (SD)=3.58 (3.94)		
>6-12 months	35	25.4
>1-2 years	25	18.1
>2-5 years	64	46.4
>5 years	14	10.1
HF category by LVEF (%)		
HFrEF	50	35.2
HFim/mEF	45	31.7
HFpEF	38	26.8
No reports	11	6.3
VO₂ peak / Range=19.58-34.63, Mean (SD)=28.42 (5.49)		
NYHA classification		
NYHA I	105	72.9
NYHA II	39	27.1
Treatment		
Beta-Blocker	117	81.3
Diuretic	95	66.0
Angiotensin Converting Enzyme inhibitor (ACEi)	32	22.2
Angiotensin Receptor Blockers (ARB)	20	13.9
Digoxin/ Digitalis	3	2.1
No medication	10	7.0
Other Treatments		
Sleeping pills	21	14.7
PDE-5 inhibitors	1	0.7

Table 3. Mean score of METs, mental health status, and partner communication.

Variables	Range		Mean (SD)	Median
	Possible range	Actual range		
METs	2.74-9.89	5.59-9.89	8.12 (1.57)	8.91
Mental health status				
Depression	0-21	0-13	0.76 (1.36)	0.0
Anxiety	0-21	0-11	1.50 (1.99)	1.0
Stress	0-21	0-10	2.09 (2.42)	1.0
Partner Communication	13-78	28-66	40.81 (7.00)	40.0

Table 4. Number of participants categorized by age and mental health status.

Variables	Frequency (n)	Percentage (%)	Duration or Frequency of SA			
			Decreased		As usual	
			Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Age (years)						
18-60	60	41.67	52	36.11	8	5.56
>60	84	58.33	77	53.47	7	4.86
Mental health status						
Depression						
Not sense	141	97.92	128	88.89	13	9.03
Sense	3	2.08	1	0.69	2	1.39
Anxiety						
Not sense	124	86.10	113	78.47	11	7.64
Sense	20	13.90	16	11.11	4	2.78
Stress						
Not sense	135	93.75	122	84.72	13	9.03
Sense	9	6.25	7	4.86	2	1.39

Table 5. Binary Logistic regression analysis*.

Predictors	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
Age (years)								
18-60	0.290	0.628	0.213	1	0.644	1.336	0.390	4.573
>60								
METs	1.015	0.382	7.069	1	0.008	0.362	0.172	0.766
Mental health status								
Depression								
Not sense	6.247	2.249	7.715	1	0.005	0.002	0.000	0.159
Sense								
Anxiety								
Not sense	1.374	0.958	2.056	1	0.152	0.253	0.039	1.656
Sense								
Stress								
Not sense	1.237	1.754	0.498	1	0.481	3.447	0.111	107.248
Sense								
Partner communication	0.145	0.067	4.669	1	0.031	1.156	1.014	1.319
Constant	4.186	3.830	1.195	1	0.274	65.753		

*Nagelkerke R²=0.352; -2LL=69.149; Hosmer & Lemeshow Test:Chi-square=12.261; p=0.140

Anxiety and stress also failed to emerge as significant predictors of decreased SA in the study. Although these conditions are prevalent among patients due to the fear of symptom exacerbation (Wisnicka et al., 2021) and are known to compromise cardiovascular health (Sanchis-Gomar & Lippi, 2025), their specific impact on sexual assertiveness remained statistically negligible. Several factors may explain this finding. A high proportion of participants were receiving Beta-blockers (81.30%) and Angiotensin-Converting Enzyme (ACE) inhibitors (22.20%)—medications that stabilize the heart by inhibiting the sympathetic nervous system (SNS) and the renin-angiotensin-aldosterone system (RAAS). With promoting ventricular remodeling and improving cardiac contractility (Harris et al., 2021), these therapies likely contributed to the stabilization of participants' symptoms. The study sample exhibited low baseline stress, with 93.8% reporting normal levels and only 6.3% experiencing elevated stress. This correlates with the participants' high functional status, as the majority were classified as NYHA Class I (72.9%) or Class II (27.1%). These results suggest that disease progression had not yet impaired daily activities or necessitated major lifestyle changes. Furthermore, the finding that 46.5% of participants reported sufficient income and savings likely acted as a buffer, mitigating financial burdens and reducing the anxiety that might otherwise negatively impact SA. The low prevalence of anxiety (13.90%) and stress (6.25%) among participants, combined with even lower rates of co-occurrence with reduced SA (11.11% and 4.86% respectively), likely limited the statistical power to detect significant associations. Furthermore, the use of a mixed-gender sample may have obscured significant gender-specific fears. For instance, research indicates that over 25% of female patients experience a fear of symptom exacerbation or death during SA, which can elevate anxiety (Kucukkaya & Gonenc, 2023). Additionally, recent research suggests that higher stress levels can correlate with enhanced coping strategies within couples, improving stronger sexual communication and emotional support (Yurkiw & Johnson, 2021; Aljaffer et al., 2025). In this context, it is plausible that effective partner coping and mutual understanding served as protective buffers, mitigating the adverse effects of stress on SA. This dynamic may have reduced the statistical visibility of stress as a standalone predictor. Consequently, though stress is frequently implicated in sexual dysfunction (Girouard et al., 2025; Velurajah et al., 2022; Montejo, 2022), the presence of strong relational coping mechanisms likely mitigated its impact among participants.

Notwithstanding its practical contributions to clinical practice, several limitations of this study must be acknowledged. For example, random sampling was not feasible due to the cultural sensitivity of SA discussions in Thai population. Consequently, the study utilized purposive sampling, recruiting only married participants willing to discuss SA following their HF diagnosis. However, this sampling approach limits the generalizability of the findings to unmarried, divorced, or widowed individuals, whose experiences with SA may differ significantly from those of married couples. Furthermore, the exclusive focus on tertiary care hospitals may limit the applicability of the findings to patients in primary or community-based settings, where resource availability and clinical support often vary. The small proportion of participants reporting mental health status likely hindered the detection of relationships between psychological distress and SA changes.

Conclusion

The study revealed that a substantial proportion of patients with HF experience reduced SA frequency and or duration. METs, depression, and partner communication were significant predictors during the study. These findings emphasize the multidimensionality of sexual health in HF and underscore the need for sexual health assessments into routine care. Emphasis should be placed on promoting functional capacity, evaluating psychosocial well-being, and improving open sexual communication. Cardiovascular nurses are responsible for initiating sensitive conversations to reduce patient embarrassment and provide evidence-based counseling on how to safely resume sexual activity. These findings suggest the need for future research to assess the interaction between gender, relational dynamics, and specific forms of psychological distress more precisely to elucidate their roles in the sexual well-being of patients. For future recommendation, clinical guidelines supporting comprehensive sexual counseling are fundamental as it may address physical, emotional, and relational concerns. What's more, interventions should include physical activity programs, mental health screening with referrals, and couple-based education to maintain intimacy among patients and their families.

Acknowledgments

The authors wish to express profound thanks to Professor Duncan Richard Smith, Ph.D. (Portsmouth Polytechnic, UK, 1987), whose meticulous English language edits significantly enhanced the clarity and precision of this work.

AI statements

The authors declare that the manuscript was developed without any involvement from generative -text AI tools.

Author's declaration

All the authors contributed to the conceptualization, methodology, data validation, data analysis, and manuscript preparation for publication.

Availability of data and materials

Data and supporting materials are available upon request to the corresponding author. Access will be granted provided the request is supported by a valid scientific justification and intended for research use.

Competing interests

The authors have no conflicts of interest to declare relevant to the content of the study.

Ethical clearance

The study was conducted in accordance with the Declaration of Helsinki and approved by the Human Research Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University (COA No. MURA2024/412, June 15, 2024) and the Human Research Ethics Committee of Police general hospital (No.0036.ศรจ(พจ)/112, July 17, 2024).

Funding

This study is partially supported by the Faculty of Graduate Studies and Graduate Studies of Mahidol University Alumni Association (Academic year 2024).

Publishers and journal's note

This study is crucial because it examines the factors affecting sexual activity in the heart failure population. Though conducted only in Thailand, the result provided a foundation for future research using more advanced methodologies. I believe cardiovascular nurses should read this study to broaden their understanding of this often-overlooked area.

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Authors' insight

Key points

- The study explores how physiological capacity collectively influence sexual health among patients with HF in Thai population.
- The research provides insights that traditional norms and communication styles in Southeast Asia impact the management of chronic illness and intimacy.
- The findings advocate for a shift in HF protocols, suggesting that sexual well-being should not be treated as a secondary issue but integrated into routine physical and mental health assessments.

Emerging nursing avenues

- To what extent do METs and mental health status predict the frequency and quality of SA among patients with HF in Thailand?
- How does the quality of partner communication moderate the relationship between physical functional capacity and sexual satisfaction in the context of Thai values?
- What is the significant impact of mental health status (e.g., anxiety, depression) on SA among patients with HF in Thailand?

How to cite this article (APA style)

Rawangban, P., Junda, T., & Sumdaengdrit, B. (2026). Factors influencing sexual activity among patients with heart failure in Thailand. *Journal of Holistic Nursing Science*, 13(1), 86–101. <https://doi.org/10.31603/jhns.v13i1.14543>