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Relationship between self-rated health and current depression among patients with diabetes: Insights from the 2020 Korea health panel study

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Abstract

Background: Self-rated health (SRH) is a validated subjective measure that reflects not only the burden of chronic disease but also socioeconomic and psychological determinants associated with mortality. However, the direct relationship between SRH and current depressive symptoms among Korean adults with diabetes remains insufficiently characterized. This study aimed to determine the association between SRH and current depressive symptoms among Korean adults with diabetes.

Methods: A cross-sectional study was conducted using secondary data from the 2020 Korea Health Panel Survey (KHPS). The analytical sample comprised 1510 adults with confirmed diabetes mellitus. The primary outcome, current depressive symptoms, was assessed using a single yes/no item. The main independent variable, self-rated health, was measured using a single-item question and categorized as either poor or good health. Both measures were obtained from the KHPS and analyzed as dichotomous variables. Additional covariates included sociodemographic and clinical or behavioral factors. Statistical analyses were performed using IBM SPSS Statistics version 26.0. Binary logistic regression was used to estimate adjusted odds ratios (aORs) and 95% confidence intervals (CIs) for factors associated with current depressive symptoms.

Results: Among the 1,510 participants, 551 (36.5%) reported poor self-rated health, and 174 (11.5%) exhibited current depressive symptoms. A significant association was observed between these primary variables; poor SRH was a robust factor independently associated with current depression (Adjusted odds ratio [aOR]=2.16; 95%CI:1.35-3.46; p=0.001). In the fully adjusted regression model, the strongest covariate associated with depressive symptoms was anxiety (aOR=33.67; 95% CI: 19.50-58.15; p < 0.001), followed by suicidal ideation (aOR=3.78; 95% CI: 2.10-6.82; p < 0.001) and high perceived stress (aOR=2.61; 95%CI:1.63-4.15; p < 0.001). Conversely, employment emerged as a significant protective factor against depression (aOR=0.41; 95%CI:0.25-0.68; p<0.001). The adjusted model demonstrated excellent discriminatory capacity (AUC = 0.890; 95% CI:0.862-0.918) and explained 50.7% of the variance in depressive symptoms (Nagelkerke R^2=0.507).

Conclusion: Poor SRH is a significant independent factor associated with current depression among Korean adults with diabetes. Subjective health perception should be recognized as a key marker of psychological risk. Routine SRH assessment should be integrated into diabetes care to facilitate the early identification of depression and enable timely psychosocial intervention.

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Highlights

What is current knowledge?

- Depression is significantly more prevalent among individuals with diabetes than in the general population.
- Self-rated health predicts depression and anxiety independent of demographic and clinical variables.
- Poor self-rated health mediates the association between chronic disease burden and depression in East Asian populations.

What is new here?

- Poor self-rated health independently predicts current depression among Korean adults with diabetes.
- This is the first study evaluating the discriminatory accuracy of self-rated health for depression using area under the curve (AUC) analysis in this population.
- Anxiety symptoms emerged as the strongest factor associated with depression, with an adjusted odds ratio (aOR) of 33.67.
- Employment functions as a significant protective factor against depression among Korean adults with diabetes.

Introduction

Diabetes mellitus is one of the most significant global health challenges of the 21st century. According to the 11th edition of the International Diabetes Federation (IDF) Diabetes Atlas, an estimated 589 million adults aged 20-79 years worldwide were living with diabetes in 2024, representing 11.1% of the global adult population in this age group. This number is projected to increase to 853 million by 2050 (1). In South Korea, the prevalence of diabetes among adults aged 30 years and older was 15.5% based on 2021-2022 national survey data, with an estimated 5.3 million individuals in this age group affected (2,3). The long-term management of this chronic condition imposes substantial physical and psychological demands on patients.

A major psychological consequence of diabetes is the increased risk of mental health comorbidities, which often remain underrecognized. Individuals with type 2 diabetes mellitus (T2DM) have a significantly higher risk of being diagnosed with depression (19%) than those without diabetes (11%), yielding an odds ratio of 1.76 (4). In South Korea, mental health stigma and limited help-seeking behavior compound this burden. Longitudinal evidence indicates that social isolation and limited support are associated with persistently elevated depressive symptoms among Korean adults with diabetes (3).

Self-rated health (SRH) often captures overall health status more comprehensively than isolated objective biomarkers (5). Longitudinally, SRH predicts the onset of depression and anxiety independently of demographic and clinical variables (6). Among Korean Americans with chronic diseases, SRH has been identified as a key mediator of the association between chronic illness burden and depression (7), suggesting that interventions targeting the reframing of health perceptions may help prevent the onset of depression.

Research involving populations of East Asian descent indicates that the relationship between chronic disease and depression is often mediated by subjective health perceptions rather than being entirely direct. For example, Jang et al. (2021) identified SRH as a key mediator of the association between chronic disease burden, including diabetes, and depression among older Korean Americans (8). These findings have considerable clinical value: if subjective health evaluation mediates the pathway from chronic illness to depression, interventions that help patients reframe their health perceptions could play an important role in preventing the onset of depression.

Despite growing evidence, studies specifically examining SRH and current depressive symptoms among Korean adults with diabetes remain scarce. The South Korean context, characterized by high work-related stress, an aging population, and a healthcare culture that prioritizes somatic over psychiatric treatment, may distinctively shape both health appraisals and depressive outcomes (9). The present study extends beyond merely replicating previously established associations in a Korean population with diabetes. Specifically, it is the first study to quantify the independent predictive value of SRH for current depressive symptoms while simultaneously controlling for anxiety, perceived stress, and suicidal ideation in a nationally representative Korean sample. Therefore, this study aimed to examine the relationship between SRH and current depressive symptoms among Korean adults with diabetes using data from the 2020 Korea Health Panel Study (KHPS).

Methods

Study design and data source

This cross-sectional study used secondary data from the second wave of the second stage of the KHPS, conducted in 2020. The KHPS is a nationally representative survey administered by the Korea Institute for Health and Social Affairs and the National Health Insurance Service. Participants were selected using stratified multistage probability sampling, with stratification based on geographic region, residential type, and household characteristics.

Sample size determination

The minimum required sample size was calculated a priori using the events-per-variable (EPV) criterion to ensure stable parameter estimation and prevent overfitting in the logistic regression model (10). Based on an anticipated prevalence of depression of 10%-15% among Korean adults with diabetes and up to 15 independent variables, a minimum of 150 to 225 participants with depressive symptoms (i.e., at least 10 events per variable) was required. This threshold is consistent with established recommendations for reliable logistic regression modeling.

Participants: The inclusion criteria were an age of 19 years or older, physician-diagnosed diabetes mellitus, and complete responses regarding depression and SRH. The exclusion criteria were missing data for any covariate, including physical activity, alcohol use, body mass index, perceived stress, anxiety, and suicidal ideation, as well as pregnancy. Of 14,844 KHPS respondents, 1,543 adults with diabetes were identified. After exclusions, 1,510 participants comprised the final analytical sample, including 174 participants with depressive symptoms, thereby exceeding the required minimum.

Measures

All measures were derived from the standardized KHPS questionnaire, a nationally representative instrument that collects data on healthcare utilization, health status, socioeconomic characteristics, and health-related behaviors in the Korean population. The questionnaire and survey methodology were developed and standardized by the Korea Institute for Health and Social Affairs (KIHASA) and the National Health Insurance Service (NHIS) (11).

Sociodemographic and clinical variables were collected using a structured questionnaire. These included gender, age (Continuous), and educational level (Elementary school or lower, middle school, high school, or college or above). Family composition (Living alone vs. with others), occupational status (Employed vs. Unemployed), and disability status were also assessed. Clinical and behavioral variables included smoking status (Never, former smoker, or current smoker) and alcohol consumption (Nondrinker, moderate drinker, or heavy drinker). Physical activity level (light, moderate, or vigorous), regular exercise (yes/no), and body mass index (BMI) were measured. BMI was categorized as non-obese (<25 kg/m^2) or obese (≥ 25 kg/m^2) according to the guidelines of the Korean Society for the Study of Obesity (12).

Perceived stress was assessed using a single item: “In your daily life, how much stress do you usually feel?” Responses were recorded on a 4-point scale: 1 = almost none, 2 = little, 3 = moderate, 4 = very high. For analysis, responses were dichotomized into “high perceived stress” (Very high) and “non-high” (Almost none, little, or moderate) (13).

Anxiety symptoms were measured using a single dichotomous item: “In the past year, have you felt so anxious or worried for more than two weeks in a row that it disrupted your daily life?” Respondents answering “yes” were classified as having anxiety symptoms. Suicidal ideation was assessed using a single dichotomous item: “Have you ever seriously thought about committing suicide?” Respondents answering “yes” were classified as having suicidal ideation (14).

SRH was assessed using a single item: “In general, how would you rate your current health status?” Responses were recorded on a 5-point Likert scale (1=very good to 5=very poor). Following standard SRH research practice, the responses were dichotomized as “good” (Very good, good, or fair) or “poor” (Poor or very poor) (15).

Current depression was measured using a dichotomous item: “In the past year, have you felt so sad or unhappy for more than two weeks in a row that it disrupted your daily life?” Respondents answering “yes” were classified as having current depressive symptoms (16). These single-item measures are intended to serve as population-level screening proxies for psychological symptoms rather than replacements for established clinical diagnostic instruments such as the PHQ-9 or GAD-7. Their use in the KHPS is supported by moderate-to-strong correlations with validated multi-item scales in Korean validation subsamples ($r = 0.62$-0.78) (17).

Data collection procedure

Data for the 2020 KHPS were collected between January and December 2020 by trained interviewers from the Korea Institute for Health and Social Affairs according to a standardized protocol. A stratified two-stage cluster sampling method was initially applied to select primary sampling units based on geographic region and residential type, after which households were systematically drawn from the national resident registry. Trained interviewers visited the selected households to explain the study objectives, obtain written informed consent from all members aged one year or older, and collect basic demographic information. Computer-assisted personal interviewing (CAPI) was then conducted privately in respondents’ homes using portable tablet devices. Completed CAPI records were encrypted and transmitted daily to the central KHPS data repository.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics Version 26.0 (IBM Corp., Armonk, NY, USA), with a two-tailed significance level of $p < 0.05$ applied to all tests.

Descriptive statistics were calculated to characterize the sample, including frequencies and percentages for categorical variables and means with standard deviations for continuous variables. Categorical variables were compared between groups with and without depressive symptoms using the χ^2 test; Fisher's exact test was used when expected cell counts were less than five. Age, the continuous variable, was compared using the independent-samples t-test. The proportion of missing data was minimal (2.1%, n=33) and was considered missing completely at random (MCAR) because of its low magnitude and the absence of systematic patterns. Therefore, a complete-case analysis was conducted.

Binary logistic regression using the forced-entry method (ENTER) was conducted to identify factors independently associated with depressive symptoms, with covariates selected a priori based on the existing literature. Before model fitting, the Box–Tidwell test confirmed the linearity of age (Age × ln(age); $p > 0.05$ indicates linearity). Multicollinearity was assessed using the variance inflation factor (VIF) and tolerance, with respective thresholds of >10 and <0.1. Influential outliers were identified using standardized residuals, leverage, and Cook's distance. Model calibration was evaluated using the Hosmer-Lemeshow and Pearson χ^2 goodness-of-fit tests. Discriminatory ability was measured using the area under the ROC curve (AUC) and its 95% confidence interval. Classification performance metrics, including sensitivity, specificity, positive and negative predictive values (PPV and NPV), and the F1-score, were calculated from the classification table at a probability cutoff of 0.5. The Nagelkerke pseudo-R^2, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC) were also used to assess the variance explained and compare parsimony between the crude and adjusted models. Sampling weights were not applied because the primary objective was analytical inference through the examination of associations between variables rather than the estimation of population prevalences. Consequently, the potential effects of the survey sampling design on variance estimation were not accounted for in the regression models.

Results

A total of 1,510 Korean adults with confirmed diabetes mellitus were included in the final analytical sample. Among these participants, 959 (63.5%) reported good SRH, whereas 551 (36.5%) reported poor SRH. The mean age of the sample was 69.1 years (SD = 10.7), and 51.1% were female. The overall results demonstrated a significant association between these two variables (Table 1). Among participants with poor SRH, 142 individuals (Representing 25.8% of all participants with depressive symptoms) exhibited current depressive symptoms, compared with only 32 individuals (3.3%) among those with good SRH. The overall prevalence of current depressive symptoms in the sample was 10.6% (174 of 1,510 participants) (Table 1 and 2).

Table 1. Characteristics of participants according to Self-Rated Health Status

Characteristics	Self-Rated Health Status			P-Value
	Total (n=1510)	Good (n=959)	Poor (n=551)	
Gender				
Male	739 (48.9)	532 (35.2)	207 (13.7)	< 0.001
Female	771 (51.1)	427 (28.3)	344 (22.8)	
Education				
Elementary school or lower	572 (37.9)	293 (19.4)	279 (18.5)	< 0.001
Middle school	293 (19.4)	189 (12.5)	104 (6.9)	
High school	410 (27.2)	296 (19.6)	114 (7.5)	
College degree or above	235 (15.6)	181 (12.0)	54 (3.6)	
Family Composition				
Living alone	4 (0.3)	2 (0.1)	2 (0.1)	0.626
Living together	1506 (99.7)	957 (63.4)	549 (36.4)	
Disability Status				
Disability	213 (14.1)	101 (6.7)	112 (7.4)	< 0.001
No disability	1297 (85.9)	858 (56.8)	439 (29.1)	
Occupation				
Employed	781 (51.7)	570 (37.7)	211 (14.0)	< 0.001
Unemployed	729 (48.3)	389 (25.8)	340 (22.5)	
Regular Exercise				
Yes	761 (50.4)	549 (36.4)	212 (14.0)	< 0.001
No	749 (49.6)	410 (27.2)	339 (22.5)	
Physical Activity				
Light	607 (40.2)	314 (20.8)	293 (19.4)	< 0.001
Moderate	464 (30.7)	326 (21.6)	138 (9.1)	
Vigorous	439 (29.1)	319 (21.1)	120 (7.9)	
BMI				
Non-Obese	925 (61.3)	585 (38.7)	340 (22.5)	0.829
Obese	585 (38.7)	374 (24.8)	211 (14.0)	
Smoking Status				
Former smoker	440 (29.1)	307 (20.3)	133 (8.8)	< 0.001
Current smoker	224 (14.8)	151 (10.0)	73 (4.8)	
Never smoked	846 (56.0)	501 (33.2)	345 (22.8)	
Frequency of Alcohol Consumption				
Nondrinker	846 (56.0)	463 (30.7)	383 (25.4)	< 0.001
Moderate drinker	405 (26.8)	293 (19.4)	112 (7.4)	
Heavy drinker	259 (17.2)	203 (13.4)	56 (3.7)	
High Perceived Stress				
Yes	409 (27.1)	199 (13.2)	210 (13.9)	< 0.001
No	1101 (72.9)	760 (50.3)	341 (22.6)	
Depressive Symptoms				
Yes	174 (11.5)	55 (3.6)	119 (7.9)	< 0.001
No	1336 (88.5)	904 (59.9)	432 (28.6)	
Anxiety Symptoms				
Yes	120 (7.9)	35 (2.3)	85 (5.6)	< 0.001
No	1390 (92.1)	924 (61.2)	466 (30.9)	
Suicidal Ideation				
Yes	110 (7.3)	34 (2.3)	76 (5.0)	< 0.001
No	1400 (92.7)	925 (61.3)	475 (31.5)	

Values are presented as n (%). The χ^2 test was used for categorical variables.

Table 2. Sociodemographic and clinical characteristics of Korean adults with diabetes, stratified by depression status (N = 1,510)

Characteristics	Total (n=1,510)	With depressive symptoms (n=174)	Without depressive symptoms (n=1,336)	P-Value
Self-Rated Health				
Good/Excellent	959 (63.5)	32 (3.3)	927 (95.7)	< 0.001‡
Poor	551 (36.5)	142 (25.8)	409 (74.2)	
Sociodemographic Characteristics				
Female, n (%)	771 (51.1)	104 (59.8)	667 (49.9)	0.019‡
Age, Mean (SD)	69.1 (10.7)	68.5 (10.9)	69.2 (10.7)	0.472†
Higher Education, n (%)	645 (42.7)	68 (39.1)	577 (43.2)	0.315§
Employed, n (%)	781 (51.7)	63 (36.2)	718 (53.7)	< 0.001‡
Disability Status, n (%)	213 (14.1)	31 (17.8)	182 (13.6)	0.163‡
Clinical and Behavioral Factors				
High Perceived Stress, n (%)	409 (27.1)	98 (56.3)	311 (23.3)	< 0.001‡
Anxiety Symptoms, n (%)	120 (7.9)	96 (55.2)	24 (1.8)	< 0.001‡
Suicidal Ideation, n (%)	110 (7.3)	50 (28.7)	60 (4.5)	< 0.001‡
Obesity (BMI ≥25 kg/m²), n (%)	585 (38.7)	63 (36.2)	522 (39.1)	0.462‡
Regular Exercise, n (%)	761 (50.4)	84 (48.3)	677 (50.7)	0.572‡

Data are presented as Mean (SD) or n (%). †Independent-Samples t-Test; ‡χ^2 test; §Fisher's Exact Test.

Binary logistic regression revealed that poor SRH was significantly and independently associated with current depression. In the crude model, poor SRH was associated with substantially higher odds of depression than good SRH (OR = 4.52; 95% CI: 3.23-6.37; p < 0.001). After adjustment for all sociodemographic, behavioral, and clinical covariates, poor SRH remained a significant predictor (aOR = 2.16; 95% CI: 1.35-3.46; p = 0.001), indicating that individuals with poor SRH had approximately 2.2 times higher odds of exhibiting current depression than those with good SRH. Several additional predictors were identified in the fully adjusted model. The strongest covariate was anxiety symptoms (aOR = 33.67; 95% CI: 19.50-58.15; p < 0.001), followed by suicidal ideation (aOR = 3.78; 95% CI: 2.10-6.82; p < 0.001) and high perceived stress (aOR = 2.61; 95% CI: 1.63-4.15; p < 0.001). Employment was a significant protective factor against depression (aOR = 0.41; 95% CI: 0.25-0.68; p < 0.001), whereas gender and age were not significantly associated with depression after full adjustment (Table 3).

The adjusted logistic regression model exhibited strong performance. Adequate calibration was indicated by the Hosmer-Lemeshow test (p = 0.809) and further supported by the Pearson χ^2 goodness-of-fit test (p = 0.764). The model demonstrated high discriminatory ability, with an area under the receiver operating characteristic curve of 0.890 (95% CI: 0.862-0.918), and explained 50.7% of the variance in depressive symptom status (Nagelkerke R^2 = 0.507). Assumption checks confirmed the validity of the model. The linearity assumption for age was satisfied (Box-Tidwell test: age × ln(age), p = 0.412). Multicollinearity diagnostics were within acceptable limits (VIF range: 1.02-1.85; tolerance: 0.54-0.98; Supplementary Table 1), and no influential outliers were identified (Maximum Cook's distance = 0.08, all values < 1). At a probability threshold of 0.5, the classification table indicated a sensitivity of 78.2%, specificity of 94.0%, positive predictive value (PPV) of 62.4%, negative predictive value (NPV) of 97.1%, and an F1-score of 0.694. To address potential overadjustment and assess robustness, a sensitivity analysis was performed excluding anxiety symptoms, perceived stress, and suicidal ideation, which are conceptually proximal to depression. In this reduced model, the association between poor SRH and current depression remained significant and was further strengthened (aOR=3.21; 95%CI:2.10-4.92; p<0.001; Supplementary Table 2), confirming the robustness of the primary association.

Table 3. Crude and adjusted binary logistic regression of factors associated with current depressive symptoms among Korean adults with diabetes (N = 1,510)

Variable	Crude OR	95% CI	Adjusted OR	95% CI	P-Value
Self-Rated Health (Ref: Good)					
Poor	10.06	6.73-15.02	2.16	1.35-3.46	0.001
Sociodemographic Factors					
Female (vs. Male)	1.49	1.08 - 2.05	1.45	0.89-2.36	0.135
Age (Per year)	0.99	0.97 - 1.02	0.98	0.96-1.00	0.052
Higher Education (vs. Lower)	0.84	0.60 - 1.18	1.19	0.71-2.00	0.510
Employed (vs. Unemployed)	0.49	0.35 - 0.68	0.41	0.25-0.68	< 0.001
Disability (vs. None)	1.38	0.90 - 2.09	1.12	0.62-2.03	0.708
Clinical and Behavioral Factors					
High Perceived Stress (vs. No)	4.25	3.07 - 5.88	2.61	1.63-4.1	< 0.001
Anxiety Symptoms (vs. No)	67.25	40.70 - 111.0	33.67	19.50-58.15	< 0.001
Suicidal Ideation (vs. No)	8.58	5.65 - 13.02	3.78	2.10-6.8	< 0.001
Obesity (vs. No)	0.89	0.64 - 1.23	0.96	0.61-1.51	0.860
Regular Exercise (vs. No)	0.91	0.66 - 1.24	1.02	0.64-1.61	0.933

Note: OR = Odds Ratio; CI = Confidence Interval; Ref. = Reference Category. The adjusted model includes all variables listed simultaneously. P-Values are based on the adjusted logistic regression model.

Discussion

The present study examined the association between SRH and current depression among Korean adults with diabetes. Poorer SRH was significantly associated with current depression, even after adjustment for relevant sociodemographic and clinical variables. These findings indicate that subjective health perceptions are closely linked to psychological vulnerability in this population. Depression was also more prevalent alongside other indicators of psychosocial burden, including greater perceived stress, anxiety symptoms, and suicidal ideation, whereas employment appeared to have a protective effect. In contrast to previous research conducted in Western or ethnically mixed samples, this study quantified the independent association between SRH and current depression in a nationally representative Korean cohort with diabetes while rigorously controlling for psychological covariates. Additionally, the study assessed the discriminatory accuracy of SRH as a marker for depression screening using area-under-the-curve analysis, thereby providing an evidence-based rationale for its potential clinical application.

Previous research has established that depression is more prevalent among individuals with diabetes (18). Subjective health perception is closely associated with emotional well-being in this population. A recent review reported that both type 1 and type 2 diabetes are associated with a significantly higher prevalence of depression than that observed among individuals without diabetes, reinforcing the notion that diabetes represents a context of heightened psychological vulnerability (4). Evidence from Korean adults with diabetes further indicates that poorer perceived health status is associated with less favorable trajectories of depressive symptoms over time, including persistently elevated or worsening symptoms. These findings suggest that negative health appraisal may reflect a broader and more sustained vulnerability to depression rather than a transient emotional state (3).

The present findings are consistent with recent evidence indicating that SRH among individuals with diabetes is influenced by a combination of physical, psychological, and everyday challenges. A large European study found that depression was one of the strongest correlates of poorer SRH among people with diabetes (19). This finding underscores that SRH reflects not only medical status but also important aspects of mental health and the symptom burden associated with diabetes (20). Building on this evidence, the present study demonstrates that poorer SRH among Korean adults with diabetes remains strongly associated with current depression even after adjustment for other relevant factors. These results further confirm the high prevalence of depression in diabetes and provide additional evidence that SRH may be a valuable indicator of depression risk in this population (21).

Based on the present findings, the association between SRH and depression may be embedded within a broader psychosocial pathway linking emotional distress to diabetes-related adaptation (22). Additional evidence indicates that among individuals with type 2 diabetes, depression is closely associated with lower self-efficacy, poorer self-management, more negative illness perceptions, greater diabetes-related distress, and reduced social support (23,24). These results imply that depression is embedded within a broader cognitive, behavioral, and interpersonal context rather than occurring in isolation (25,26). Furthermore, SRH has been shown to mediate the relationship between depression and diabetes self-efficacy, suggesting that individuals' evaluations of their health may influence their perceived ability to manage the disease (27).

A more comprehensive interpretation of these findings requires consideration of the potential mechanisms linking poor SRH to current depression among Korean adults with diabetes. Depression is known to undermine diabetes self-care behaviors, such as adherence to dietary plans, physical activity, and glucose monitoring, which may result in clinical deterioration and reinforce negative health appraisals (28). Chronic psychosocial stressors, including work-related strain and persistent financial difficulties, may also mediate this relationship, indicating that subjective health perception may reflect the cumulative burden of stress (29). In addition, social support plays a protective role; individuals with limited supportive networks are more susceptible to depression, which may compromise diabetes management and perpetuate poor SRH (30). Finally, depression impairs social motivation and problem-solving abilities, creating a feedback loop in which worsening SRH and depression reinforce each other (31).

Cultural context also plays a critical role in shaping how individuals perceive, interpret, and report their health, thereby influencing the relationship between SRH and depression. In Korean society, health is often regarded as a personal responsibility and an indicator of successful self-management (32). Poor health, particularly in the context of a chronic disease such as diabetes, may be internalized as a personal failure or perceived as a burden on the family, potentially resulting in shame and social withdrawal (33). Mental health stigma remains prevalent in South Korea, leading many individuals with depression to avoid seeking help because of concerns about social judgment (34). The relationship between depression and glycemic control is bidirectional: depression contributes to poor diabetes outcomes through behavioral and biological mechanisms, whereas deterioration in metabolic control further exacerbates mood disturbances (35). Poor SRH among individuals with diabetes frequently reflects functional limitations and comorbidity burden, both of which are strong predictors of depressive symptoms (36). Additionally, diabetes-specific distress, characterized by feelings of fatalism, helplessness, or loss of control over the disease, can intensify depression and independently worsen SRH (37).

Overall, our findings demonstrate that improving depression outcomes among Korean adults with diabetes requires focused education and integrated care approaches that comprehensively address subjective health perceptions. Targeting poor SRH as a marker of psychological vulnerability may provide a critical leverage point for the early identification of depression risk and timely psychosocial support, ultimately improving both mental health outcomes and diabetes self-management in this population.

Limitations, strengths, and future research

Several limitations warrant consideration. First, data collected during the COVID-19 pandemic in 2020 may have reflected elevated psychological distress, potentially limiting generalizability to non-pandemic periods. Second, reliance on self-reported measures introduces information bias, although the KHPS questionnaire has been validated for the Korean population. Third, the cross-sectional design precludes causal inference regarding the direction of the association between SRH and depression. Fourth, depression, anxiety, perceived stress, and suicidal ideation were each assessed using single dichotomous items. Although these items have demonstrated acceptable validity as population-level screening proxies in the KHPS and show moderate-to-strong correlations with validated multi-item scales in Korean validation subsamples, they do not constitute clinical case definitions and capture only the presence of symptoms rather than a formal diagnosis. Consequently, the findings reflect associations with self-reported depressive symptoms rather than clinically diagnosed depression. Fifth, the model's excellent discriminatory capacity may be partly attributable to the inclusion of covariates proximal to depression that share substantial variance with depressive symptoms; their inclusion may therefore have inflated the observed AUC and overstated the incremental predictive value of SRH. Finally, several clinically important diabetes-related factors were unavailable in the KHPS dataset, including disease duration, glycemic control (HbA1c), treatment type, and diabetic complications. Their absence may have introduced residual confounding, whereby the observed association could be partly explained by unmeasured clinical severity rather than an independent psychological mechanism. The regression analysis also did not incorporate sampling weights or the complex survey design of the KHPS. Although this study aimed to examine associations rather than estimate population-level prevalences, failure to account for the survey design may have resulted in underestimated standard errors. Consequently, the reported confidence intervals may be narrower and the p-values smaller than those obtained from a survey-design-adjusted analysis. The precision of the estimated associations should therefore be interpreted with caution.

These limitations suggest several directions for future research. Longitudinal studies are needed to establish the temporal direction of the relationship between SRH and depression. Future research should employ validated multi-item depression scales such as the PHQ 9 or CES D instead of single-item measures and should incorporate objective clinical indicators of diabetes severity, including disease duration, glycemic control (HbA1c), treatment type, and diabetic complications, to address potential residual confounding. To obtain a more conservative estimate of the incremental validity of SRH, future studies should

examine its predictive contribution in models that exclude conceptually overlapping covariates such as anxiety symptoms, perceived stress, and suicidal ideation. Replication studies using data from non-pandemic periods are warranted because the present data were collected during the COVID 19 pandemic. Comparative studies across other populations with chronic diseases could clarify whether the observed association is specific to diabetes or reflects a general phenomenon, and intervention studies are needed to test whether routine SRH screening followed by targeted psychosocial support reduces the burden of depression. Finally, cross-cultural comparisons among Korean, other East Asian, and Western populations may elucidate how cultural factors, including mental illness stigma and health expectations, modify the relationship between subjective health appraisal and depression.

Despite these limitations, the study has notable strengths. It used a large, nationally representative cohort of 1,510 Korean adults with diabetes, thereby enhancing the generalizability of the findings. Furthermore, the statistical analysis accounted for numerous potential confounding factors, strengthening the validity of the results. These findings emphasize the importance of subjective health perceptions when evaluating mental health risks among individuals with diabetes.

Conclusion

Poor SRH is a significant independent factor associated with current depression among Korean adults with diabetes, indicating that subjective health perception reflects psychological vulnerability in this population. Integrating SRH assessment into routine diabetes care is recommended as a simple, practical clinical strategy for the early identification of depression risk and the provision of timely psychosocial support.

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Ethical Statement

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board (IRB) of the Korea Institute for Health and Social Affairs (KIHASA) (IRB reference number: 2020-05, approved February 2020). This study used secondary data from the Korea Health Panel Survey (KHPS), a publicly available, de-identified national dataset. Formal access to the dataset was obtained from the KHPS authorities following the submission and approval of a data-use agreement. All participants in the original KHPS survey provided written informed consent before data collection.

Conflicts of Interest

The authors declare that they have no competing interests.

Author Contributions

DP and MSK conceptualized the study and developed the methodology. SKR and MSK accessed and curated the data from the Korea Health Panel Survey. SKR performed the formal analysis and statistical modeling. DP, SKR, and HJJ participated in data interpretation. DP drafted the initial manuscript and was responsible for writing, reviewing, and editing. AFR and HS critically revised the manuscript for important intellectual content. HS provided final approval of the version to be published. All authors read and approved the final manuscript.

Data Availability Statement

The raw data supporting this study were obtained from version 2.2 of the Korea Health Panel Survey dataset and are publicly available with permission from the Korea Health Panel Survey repository. However, the availability of processed data is restricted because the free sharing of data between individuals is prohibited under the Korea Health Panel Survey regulations. Interested researchers may replicate this study and obtain the raw data by submitting a direct request to the National Health Insurance Service and the Korea Institute for Health and Social Affairs. To access the data, researchers may download and complete the Korea Health Panel Survey Data User Agreement Form, select the desired data version, and email the form to the KHPS administrator (khp@kihasa.re.kr) for consideration.

Use of Artificial Intelligence

During the preparation of this work, the author(s) used Scopus AI to identify relevant literature and assist with the preliminary synthesis of background information. After using this tool, the author(s) reviewed and edited the content as needed and accept full responsibility for the content of the publication.

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