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ORIGINAL ARTICLE

Effects of the Combination of Marital Status and Household Type on Self-Rated Health among Korean Women

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Background: Self-rated health of women according to marital status and household type has rarely been considered. This study determined the differences in the self-rated health of women according to marital status and household type.

Methods: Using cross-sectional data from the seventh Korea National Health and Nutrition Examination Survey, we included 9,990 women aged above 19 years. Multiple logistic regression was used to examine the relationships between self-rated health, marital status, and household type.

Results: Overall, 74.5% of the women reported poor self-rated health. Regarding marital status and household type, one-person households and unmarried women had a higher risk of poor self-rated health (odds ratio [OR], 1.45; 95% confidence interval [CI], 1.03-2.05), while multi-person households and no-spouse women had a lower risk of poor self-rated health (OR, 0.69; 95% CI, 0.58-0.83). Furthermore, women who are one-person households and unmarried had a higher risk of poor self-rated health in those who had college or higher educational level (OR, 1.98; 95% CI, 1.25-3.13).

Conclusion: Self-rated health among women was associated with marital status and household type. Future studies are required to generalize these findings by considering various household compositions to improve women's self-rated health status.

Keywords: Self-rated health; Marital status; Living arrangement; Households type; One-person household; Women's health

INTRODUCTION

Self-rated health (SRH) is an indicator of an individual's overall health. It reflects objective health status since the prevalence of diseases is associated with poorer SRH [1]. In 2018, SRH in Korea ranked the lowest among 35 countries of the Organization for Economic Cooperation and Development at 32%, which is less than half of the average [2]. Additionally, good/very good SRH among Korean women has been continuously increasing since 2016. However, these results show that it is lower than men, especially fair, poor, and very poor SRH is higher than men [3]. Therefore, since SRH is an indicator of general health status and increases the predictive validity [4], it is a need to increase good SRH among Korean women at the national level.

One-person households are the fastest-increasing type of households in the regions of the world [5], this phenomenon is related to health outcomes. One-person households have demonstrated worse physical health status and health-promoting behaviors than multi-person households [6]. In parallel, prior studies showed that the one-person households had poor SRH than multi-person households, which is especially related to the elderly people [7].

In a society where marriage trends are constantly changing, marriage has controversial findings related to health. Although marriage provides benefits in both physical and mental health [8], a

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previous study was suggested that people with spouses are healthier or poor health than unmarried people depending on their satisfaction with marriage life [9]. Moreover, divorced or widowed women were at higher risk of poor SRH in previous studies about SRH and marital status [10]. These results seem that the impact on health or SRH differs according to the marital status of various categories.

Until recently, most previous studies had shown that SRH was associated with age, education, socioeconomic status [11], chronic diseases [12], mortality [13], gender differences, and older adults [14]. Nevertheless, there is a paucity of studies on SRH regarding marital status [10,13] and household type [15]. Few studies have examined a direct association with SRH because most of these variables were included as covariates. However, our study considered the combination of marital status and household type because marital status and household type in previous studies appeared differently in the health-related problems of each category, and these variables can be used as a means of creating a household composition. This combination might better recognize the relationship between marital status and the household type and will stand based on solving health problems.

Therefore, this study investigated the differences in poor SRH among women according to marital status and household type and determined whether poor SRH according to marital status and household type is affected by socioeconomic status. It is necessary to identify solutions to reduce poor SRH among women with respect to the combination of marital status and household type.

METHODS

1. Data source and study population

This study used cross-sectional data between 2016 and 2018 from the seventh Korea National Health and Nutrition Examination Survey (KNHANES VII), which was conducted by the Korea Centers for Disease Control and Prevention (KCDC; currently Korea Disease Control and Prevention Agency). The KNHANE surveys began in 1998 and have been conducted annually since 2007. The survey comprises three parts: a health interview survey, a health examination, and a nutrition survey. The KNHANES in 2016 and 2017 were exempted from the review by the Institutional Review Board of the KCDC. In 2018, KNHANES was conducted by obtaining the approval of the Research Ethics Review Committee of KCDC (2018-01-03-P-A).

About 24,269 individuals (8,150 in 2016, 8,127 in 2017, and 7,992 in 2018) completed this survey between 2016 and 2018. Among them, this study included women aged above 19 years. A total of 4,881 individuals aged below 19 years and 8,557 men were excluded. Furthermore, 837 individuals with missing data in SRH and 4 respondents with marital status corresponding to “don’t know” and “non-response” were eliminated. We considered the “don’t know” and “non-response” answers concerning the menstruation status and type of insurance as missing data. Finally, 9,990 survey respondents were included in our analysis.

2. Self-rated health

The outcome variable in the present study was SRH, which was assessed using the question: “In normal times, how would you think about your health?” The responses included “very good”, “good”, “fair”, “bad”, and “very bad”. In this analysis, SRH was dichotomized as “good SRH” (very good, good) and “poor SRH” (fair, poor, very poor). This dichotomization has been frequently used in previous studies [16,17].

3. Marital status and household type

Marital status was evaluated by the question “What is your current marital status?” and included five responses: married, separated, widowed, divorced, and never married. These responses were reclassified into three groups: “with spouse” (married), “no-spouse” (separated, widowed, divorced), and “unmarried” [18]. The household type was divided into two groups: “one-person households” (living alone) versus “multi-person households” (living with someone including family, partner, friends, etc.). The combination of marital status and household type was categorized into six groups: “multi-person households with spouse”, “multi-person households and no-spouse”, “multi-person households and unmarried”, “one-person households with spouse”, “one-person households and no-spouse”, and “one-person households and unmarried”.

4. Covariates

The demographic and socioeconomic variables included age (19–44, 45–64, and ≥65 years), education (elementary school or less, middle school, high school, college or more, and missing), household income indicated in quartile (Q1 [lowest], Q2, Q3, Q4 [highest], and missing), occupation (yes, no, and missing), type of insurance (self-employed insured, employee insured, medical-aid, and missing), menstruation status (fertile, infertile, and missing), waist circumference (<80 and ≥80) [19], sleep duration (<7, 7–8, and >8 hours), aerobic physical activity practice (yes, no, and missing), current smoking (yes, no, and missing), drinking (yes, no, and missing), and year (2016, 2017, and 2018). Chronic diseases such as hypertension, dyslipidemia, stroke, myocardial infarction, osteoarthritis, pulmonary tuberculosis, asthma, diabetes mellitus, thyroid dysfunction, cancers, atopic dermatitis, allergic rhinitis, and cataract were assessed according to whether the doctor made a diagnosis (0,1, and ≥2).

5. Statistical analysis

Statistical analysis included chi-square tests and multiple logistic regression analysis. Chi-square tests were performed to analyze the general characteristics of SRH. Multiple logistic regression analyses were used to investigate the relationship between poor SRH and risk factors. The Wald test was used to examine the association between poor SRH and risk factors for categorical variables. Statistical analyses were performed using SAS ver. 9.4 (SAS Inc., Cary, NC, USA).

RESULTS

Of the total participants (n=9,990) in the study, 2,545 (25.5%) and 7,445 (74.5%) women had good and poor SRH, respectively. In poor SRH, one-person households and no-spouse women (87.6%) were higher than others. The proportion of women with poor SRH was almost equal among multi-person households and no-spouse women (77.5%) and one-person households and unmarried women (77.0%). Poor SRH tended to be higher if the individual was older, had a low education level and low household income, no occupation, medical aid insurance, infertility, waist circumference ≥80 cm, less than 7 hours of sleep, no aerobic physical activity practice, current smoker, and had two or more chronic diseases (Table 1).

Table 2 lists the factors associated with poor SRH. The one-person households and unmarried women had the highest odds ratio (OR) of poor SRH (OR, 1.45; 95% confidence interval [CI], 1.03–2.05). On the other hand, multi-person households and no-spouse women were less

Table 1. General characteristics of the study participants

Characteristic	Self-rated health			*p*-value
	Good	Poor	Total	
Household type & marital status				<0.0001
Multi-person households with spouse	1,717 (26.3)	4,806 (73.7)	6,523 (65.3)	
Multi-person households & no-spouse	219 (22.5)	756 (77.5)	975 (9.8)	
Multi-person households & unmarried	400 (35.0)	743 (65.0)	1,143 (11.4)	
One-person households with spouse	33 (26.8)	90 (73.2)	123 (1.2)	
One-person households & no-spouse	125 (12.5)	879 (87.6)	1,004 (10.1)	
One-person households & unmarried	51 (23.0)	171 (77.0)	222 (2.2)	
Age group (yr)				<0.0001
19–44	1,173 (34.5)	2,232 (65.6)	3,405 (34.1)	
45–64	895 (24.7)	2,731 (75.3)	3,626 (36.3)	
≥65	477 (16.1)	2,482 (83.9)	2,959 (29.6)	
Education				<0.0001
Elementary school or less	337 (13.2)	2,219 (86.8)	2,556 (25.8)	
Middle school	165 (16.7)	823 (83.3)	988 (10.0)	
High school	822 (27.4)	2,182 (72.6)	3,004 (30.3)	
College or more	1,211 (35.9)	2,167 (64.2)	3,378 (34.0)	
Missing			64	

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Table 1. Continued

Characteristic	Self-rated health			*p*-value
	Good	Poor	Total	
Household income				<0.0001
Q1	297 (14.2)	1,793 (85.8)	2,090 (21.0)	
Q2	543 (22.2)	1,901 (77.8)	2,444 (24.5)	
Q3	745 (28.0)	1,913 (72.0)	2,658 (26.7)	
Q4	954 (34.5)	1,814 (65.5)	2,768 (27.8)	
Missing			30	
Occupation				<0.0001
Yes	1,468 (28.6)	3,668 (71.4)	5,136 (51.7)	
No	1,067 (22.3)	3,725 (77.7)	4,792 (48.3)	
Missing			62	
Type of insurance				<0.0001
Self-employed insured	660 (23.5)	2,154 (76.6)	2,814 (28.4)	
Employee insured	1,840 (27.4)	4,874 (72.6)	6,714 (67.7)	
Medical-aid	36 (9.2)	354 (90.8)	390 (3.9)	
Missing			72	
Menstruation status				<0.0001
Fertile	1,558 (32.6)	3,221 (67.4)	4,779 (48.2)	
Infertile	975 (19.0)	4,156 (81.0)	5,131 (51.8)	
Missing			80	
Waist circumference (cm)				<0.0001
<80	1,654 (29.9)	3,882 (70.1)	5,536 (55.4)	
≥80	891 (20.0)	3,563 (80.0)	4,454 (44.6)	
Sleep duration (hr)				<0.0001
<7	729 (23.1)	2,424 (76.9)	3,153 (31.6)	
7–8	1,166 (26.2)	3,281 (73.8)	4,447 (44.5)	
>8	650 (27.2)	1,740 (72.8)	2,390 (23.9)	
Aerobic physical activity practice				<0.0001
Yes	1,222 (30.4)	2,793 (69.6)	4,015 (40.5)	
No	1,309 (22.2)	4,593 (77.8)	5,902 (59.5)	
Missing			73	
Current smoking				<0.0001
Yes	85 (16.7)	425 (83.3)	510 (5.1)	
No	2,453 (26.0)	6,989 (74.0)	9,442 (94.9)	
Missing			38	
Drinking				0.25
Yes	148 (27.6)	388 (72.4)	536 (5.4)	
No	2,392 (25.4)	7,027 (74.6)	9,419 (94.6)	
Missing			35	
Chronic disease				<0.0001
0	1,406 (36.3)	2,469 (63.7)	3,875 (38.8)	
1	705 (26.8)	1,928 (73.2)	2,633 (26.4)	
≥2	434 (12.5)	3,048 (87.5)	3,482 (34.9	
Year				<0.0001
2016	870 (26.0)	2,475 (74.0)	3,345 (33.5)	
2017	766 (23.5)	2,499 (76.5)	3,265 (32.7)	
2018	909 (26.9)	2,471 (73.1)	3,380 (33.8)	
Total	2,545 (25.5)	7,445 (74.5)	9,990 (100.0)	

Values are presented as number (%).

Table 2. The association between poor SRH and the combination of household type and marital status

Variable	Poor SRH (vs. good SRH)
Household type & marital status	
Multi-person households with spouse	1.00
Multi-person households & no-spouse	0.69 (0.58–0.83)
Multi-person households & unmarried	1.02 (0.87–1.19)
One-person households with spouse	0.93 (0.61–1.43)
One-person households & no-spouse	1.04 (0.82–1.31)
One-person households & unmarried	1.45 (1.03–2.05)
Age group (yr)	
19–44	1.00
45–64	1.21 (1.03–1.41)
≥65	0.95 (0.78–1.17)
Education	
Elementary school or less	2.09 (1.71–2.55)
Middle school	1.90 (1.54–2.35)
High school	1.27 (1.13–1.43)
College or more	1.00
p for trend	<0.0001
Household income	
Q1	1.42 (1.18–1.71)
Q2	1.36 (1.19–1.55)
Q3	1.22 (1.08–1.38)
Q4	1.00
p for trend	<0.0001
Occupation	
Yes	1.00
No	1.09 (0.99–1.20)
Type of insurance	
Self-employed insured	0.53 (0.36–0.78)
Employee insured	0.52 (0.36–0.77)
Medical-aid	1.00
Menstruation status	
Fertile	1.00
Infertile	1.22 (1.05–1.43)
Waist circumference (cm)	
<80	1.08 (0.94–1.23)
≥80	1.05 (0.93–1.19)
Sleep duration (hr)	
<7	1.08 (0.94–1.23)
7–8	1.05 (0.93–1.19)
>8	1.00
Aerobic physical activity practice	
Yes	1.00
No	1.30 (1.18–1.43)
Current smoking	
Yes	1.85 (1.43–2.39)
No	1.00
Drinking	
Yes	0.97 (0.79–1.20)
No	1.00
Chronic disease	
0	1.00
1	1.44 (1.29–1.61)
≥2	2.98 (2.57–3.45)
p for trend	<0.0001
Year	
2016	1.07 (0.95–1.20)
2017	1.24 (1.10–1.39)
2018	1.00

Values are presented as odds ratio (95% confidence interval). Adjusted for age group, education, household income, occupation, type of insurance, menstruation status, waist circumference, sleep duration, aerobic physical activity practice, current smoking, drinking, chronic disease, and year.
SRH, self-rated health.

likely to have poor SRH compared to other groups (OR, 0.69; 95% CI, 0.58–0.83). The age group of 45–64 years (OR, 1.21; 95% CI, 1.03–1.41) had a higher risk of poor SRH. Compared to medical-aid insurance, self-employed (OR, 0.53; 95% CI, 0.36–0.78) and employee (OR, 0.52; 95% CI, 0.36–0.77) insurance were less likely to have poor SRH. The menstruation status of infertile women was higher in the poor SRH group than in the reference group (fertile) (OR, 1.22; 95% CI, 1.05–1.43). Low education, low income, and two or more chronic diseases were associated with a high risk of poor SRH.

Subgroup analysis presents the relationship between poor SRH and the combination of household type and marital status stratified by socioeconomic status variables (Table 3). In college and higher educational level, women who were multi-person households and unmarried, and those who were one-person households and unmarried had a higher risk of poor SRH compared to those who were multi-person households and living with a spouse, respectively (women with multi-person household and unmarried: OR, 1.98; 95% CI, 1.25–3.13; women with one-person household and unmarried: OR, 1.28; 95% CI, 1.04–1.56).

DISCUSSION

The results of this analysis revealed the effects of the combination of marital status and household type on SRH among Korean women. One-person households and unmarried women had the highest risk of

poor SRH, whereas multi-person households and no-spouse women had a lower risk of poor SRH compared to others. Additionally, we examined the trends in poor SRH according to risk factors among women with marital status and household type. Education and type of insurance were related to women's poor SRH, depending on the marital status and household type.

Our findings demonstrated that 74.5% of the entire sample had poor SRH. Even though this study included only women, it was consistent with the findings of prior studies in which Korean women had higher levels of poor SRH than men [20]. It can also be observed in other countries [21,22]. Particularly, when comparing our results to those of the previous studies, the poor SRH was much higher. The poor SRH of previous studies only included "fair or poor SRH" or "poor or very poor SRH". However, this study included "fair, poor, and very poor SRH" as poor SRH so the prevalence of SRH was much higher than previous research. Moreover, this study showed that various risk factors had a high prevalence of poor SRH than average prevalence, such as elderly ($\geq$65 years old), lower educational level, low household income, medical aid, infertile status, and so forth.

Poor SRH was the highest risk among women who were in one-person households and unmarried. On the other hand, women who were in multi-person households and no-spouse had a lower risk of poor SRH. In the relationship between household type and poor SRH, the results are consistent with previous studies that one-person households have a higher risk of poor SRH than multi-person households [7]. Particularly, these results are closely related to an increase in women's health risk [23] and old age [24]. One-person individuals exhibit worse physical health status and health-promoting behaviors, including exercise and nutrition than multi-person individuals [6]. Moreover, poorer subjective stress levels, depression, and shorter sleep duration were associated with one-person households [24].

However, considering marital status, the results of unmarried women with a high risk of poor SRH and no-spouse women with a low risk of poor SRH are inconsistent with previous studies showing that no-spouse individuals had a higher risk of poor SRH [10]. Although marriage has been linked to health benefits [8], other studies have observed that marital happiness [25] or satisfaction [9] gaps in their marriage life cause more stress and unhealthy behaviors because of the poor psychological health of married people [25]. Moreover, married people tend to overestimate their health status. Consequently, they are unaware of their health problems until their actual health conditions

Table 3. The association between poor SRH and the combination of household type and marital status stratified by age, education, household income

Variable	Poor SRH (vs. good SRH)						
	Multi-person households with spouse	Multi-person households & no-spouse	Multi-person households & unmarried	One-person households with spouse	One-person households & no-spouse	One-person households & unmarried	*p*-value*
Age group (yr)							0.29
19–44	1.00	0.70 (0.40–1.22)	1.03 (0.87–1.21)	3.45 (0.78–15.36)	0.81 (0.14–4.77)	1.47 (1.01–2.16)	
45–64	1.00	0.65 (0.49–0.85)	1.19 (0.50–2.86)	0.60 (0.35–1.01)	1.24 (0.79–1.94)	1.58 (0.59–4.28)	
≥65	1.00	0.72 (0.55–0.96)	4.31 (0.53–34.73)	1.58 (0.58–4.29)	1.03 (0.77–1.38)	1.54 (0.33–7.32)	
Education							0.01
Elementary school or less	1.00	0.69 (0.51–0.94)	0.34 (0.02–5.17)	1.09 (0.31–3.82)	0.95 (0.69–1.31)	-	
Middle school	1.00	0.67 (0.39–1.15)	0.87 (0.15–5.03)	2.81 (0.35–22.71)	0.96 (0.53–1.74)	0.94 (0.11–8.19)	
High school	1.00	0.66 (0.48–0.90)	0.69 (0.53–0.90)	0.51 (0.27–0.97)	1.69 (0.95–3.01)	0.79 (0.46–1.36)	
College or more	1.00	0.57 (0.36–0.90)	1.28 (1.04–1.56)	1.44 (0.68–3.01)	1.15 (0.57–2.30)	1.98 (1.25–3.13)	
Household income							0.29
Q1	1.00	0.62 (0.43–0.90)	0.85 (0.46–1.59)	3.63 (0.47–28.34)	1.17 (0.84–1.65)	0.99 (0.46–2.10)	
Q2	1.00	1.17 (0.81–1.69)	1.04 (0.74–1.46)	0.81 (0.35–1.88)	0.97 (0.64–1.47)	1.27 (0.66–2.46)	
Q3	1.00	0.54 (0.38–0.76)	1.05 (0.80–1.38)	0.77 (0.34–1.74)	0.70 (0.35–1.40)	1.89 (1.04–3.41)	
Q4	1.00	0.52 (0.34–0.78)	1.00 (0.77–1.28)	0.87 (0.43–1.73)	1.53 (0.50–4.69)	1.90 (0.78–4.63)	

Values are presented as odds ratio (95% confidence interval). Adjusted for occupation, type of insurance, menstruation status, waist circumference, sleep duration, aerobic physical activity practice, current smoking, drinking, chronic disease, and year, except for the stratum itself.
SRH, self-rated health.
*p-interaction: the interaction effect of the combination of household type and marital status and each socioeconomic status factors on SRH.

worsen [13]. This finding led to those who had the same or worse health as never married, separated, divorced, and widowed individuals.

Interestingly, we observed an association between poor SRH and the interaction of marital status and household type stratified by socioeconomic status. Among women with college and higher educational levels, those from multi-person households with no spouse had a higher likelihood of experiencing poor SRH than those from multi-person households with spouses. In addition, women who belonged to multi-person households and were unmarried had a higher likelihood of experiencing poor SRH than the corresponding reference groups. These results are consistent with previous findings, which suggested that previously married and never married participants, who were college graduates, were at higher risk of experiencing poor SRH than those in other categories [26]. Results indicating declining health of single adults (previously married and never married) might be related to the high record of never-married adults and an increasing number of previously married adults in the population, particularly in college graduate groups [26]. Despite both men and women being included in Lamidi's study, without considering the household type, might present an important message —the increasing phenomenon of highly educated single persons is related to their poor health status. Furthermore, our findings revealed that living alone increased the likelihood of having a high risk of poor SRH among unmarried women with college or higher education. Most prior research demonstrated that living alone was related to negative health outcomes, such as a high risk of mortality [27] and SRH [28]. Koivunen [27] suggested that living with someone was associated with lower mortality among women. Furthermore, living alone may be perceived as a stressful psychosocial situation among younger people; thus, it may affect their mental health status [27]; therefore, living arrangements may affect women's SRH. However, these studies focused more on the relationship between each variable (living arrangement, educational level, or gender) and health outcomes among older adults; therefore, further research is needed to clarify the mechanisms underlying the association between living alone and poor SRH among highly educated women.

1. Limitations and strengths

This study had several limitations. First, because of the combination of marital status and household type, smaller samples of some categories (e.g., 33 and 90 one-person households with spouse women in good and poor SRH groups, respectively) did not produce statistically significant results. Since a previous study with a larger sample showed statistically significant results [10], our study would have shown statistically significant results with a larger sample size. Second, we used a cross-sectional study design, and hence, a long-term impact cannot be identified. In addition, this also cannot be ruled out the possibility of reverse causality. Therefore, future studies should use longitudinal designs to determine their relevance and be necessary to supplement the method for reverse causality. Third, this study did not distinguish between a more specific combination of marital status and household type. If we had examined separated, divorced, and widowed individuals separately in the marital status, or included other different types such as a single-parent family or presence of children rather than only two categories in the household type, the results of the present study could have identified differences in poor SRH among women according to more diverse family composition. Fourth, our findings indicated that marriage was not directly associated with health benefits but the differences in the quality of marriage were more influential. However, since our study only examined current marital status, future research should distinguish the quality of married life.

Despite these limitations, this study has several strengths. First, our findings provide the first evidence that the SRH gap among women is related to the combination of marital status and household type. Therefore, this combination should be used in future studies to solve the related problems. Marital status and household type are closely related to each other and an increase in social problems, such as the low birth rate or the ageing society. Second, we used nationally representative data from the KNHANES, which provides data on the overall health status of Korean women. Third, SRH is an indicator of an individual's general health status; therefore, it was used in our study to investigate how individuals perceived their general health status. Fourth, our study obtained more specific results about poor SRH among women, including variables that reflected women's characteristics (waist circumference criteria and menstruation status). Prior studies on SRH among women rarely included those variables unless they were the main variables in the studies. Therefore, they should be considered in future studies of SRH among women.

2. Conclusion

The analysis suggested that SRH differences among Korean women were associated with marital status and household type. In this study, we confirmed that women who were one-person households and unmarried had a higher risk of poor SRH. Additionally, living alone and unmarried was related to the high risk of poor SRH among highly educated women. Future research should consider the combination of marital status and household type more comprehensively, considering its significant social mechanism on SRH among women. Additionally, we need to develop solutions at the national level to increase good SRH among women according to marital status and household type.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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