

## EPIDEMIOLOGY

## Sexuality-Related Factors and Quality of Life Among Reproductive-Aged Married Female Migrant Workers: A Cross-Sectional Study in Southern China



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## ABSTRACT

**Introduction:** Sexuality is a critical part of overall well-being. However, until now, studies on women's health related to the effect of sexuality on physical and psychosocial outcomes have been seriously ignored, especially the health-related quality of life (QOL) of reproductive-aged married female migrant workers.

**Aim:** To analyze the associations between sexuality-related factors and QOL and explore the independent contributions of sexuality-related factors to QOL in this population group in southern China.

**Methods:** In this cross-sectional survey, 609 Chinese married female migrant workers aged 19–49 years were studied. Clustered multiple linear regressions were used to analyze the associations between sexuality-related variables and QOL.

**Outcomes:** QOL was measured using the Short Form (SF-36) Healthy Survey. Details of the participants (sociodemographic, health-related and sexuality-related factors) were obtained.

**Results:** Approximately 10.0% of respondents always felt a lack of sexual interest and lubrication difficulties, and 37.5% of respondents seldom or never experienced sexual satisfaction. Multiple regression analyses revealed that women who never felt lubrication difficulties obtained higher role physical, bodily pain, general health, and physical component summary scores in physical domains and higher vitality (VT), mental health (MH), and mental component summary (MCS) scores in mental domains compared with those who always felt lubrication difficulties. Compared with those who always experienced sexual satisfaction, women who never experienced sexual satisfaction had relatively lower role physical, bodily pain, and general health scores in physical domains, and women who never or seldom experienced sexual satisfaction had lower VT, MH, and MCS scores in mental domains. The independent contributions of sexuality-related factors in mental domains (VT, MH, and MCS) accounted for 50.0%, 52.4%, and 39.5%, respectively; more than that of all sociodemographic and health-related variables in the VT and MH domains.

**Conclusions:** Sexuality-related factors (lubrication difficulties and sexual satisfaction) were significant independent determinants of QOL among reproductive-aged Chinese married female migrant workers, especially in mental domains. **Li BB, Liu N, Li B, et al. Sexuality-Related Factors and Quality of Life Among Reproductive-Aged Married Female Migrant Workers: A Cross-Sectional Study in Southern China. Sex Med 2019;7:384–395.**

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**Key Words:** Quality of Life; Sexuality; Reproductive Age; Migrant Workers Cross-Sectional Study; China

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## INTRODUCTION

Quality of life (QOL) is a multidimensional concept that is largely related to one's physical and mental health. It refers to the perception of an individual about their position in life, based on the culture and value system in which they live and with respect to their goals, expectations, standards, and concerns.<sup>1</sup> Although studies on QOL among Chinese women have been emerging for a long time,<sup>2,3</sup> population-based studies estimating the associations between sexuality-related factors and QOL in reproductive-aged Chinese married women are relatively scarce, let alone in reproductive-aged Chinese married female migrant workers.

Sexuality, as a basic human interest, is a vital and complicated field in QOL studies. However, it is 1 of the highly private topics in China throughout history, especially for women, so it is quite difficult to collect data on this issue.<sup>4</sup> It is worth mentioning that sexual problems are taboo subjects and negatively affect the QOL of women worldwide.<sup>5–7</sup> Compared with the relatively rich sexuality-related studies in the west, studies on sexuality in Chinese society only began in recent years.<sup>8,9</sup> 1 epidemiologic study conducted in Hong Kong reported that more than three-quarters of reproductive-aged Chinese married women (75.3%) believed sex was important to a marital relationship.<sup>6</sup> If female sexuality is disturbed, it might lead to family disharmony and divorce; furthermore, reproduction is also affected. A national study conducted in U.S. adults aged 18–59 years indicated that experiencing sexual problems was correlated with poor quality of life, and these negative outcomes appeared to be more extensive and severe for women than for men.<sup>7</sup> In another nationally representative sample of U.S. adults, the investigators found that approximately one-half of women who were sexually active regard sexual health as an important part of their QOL.<sup>10</sup> Based on the above empirical evidence, we have chosen the most common female sexual symptoms (lack of sexual interest, lubrication difficulties, sexual satisfaction, etc.) and hypothesized that these sexuality-related factors were to some extent associated with QOL of these reproductive-aged Chinese married female workers in southern China.

In China, due to economic imbalances in the modernization of rural and urban environments and familial pressure, many migrants have to move from rural areas to modern municipalities. It is estimated that the number of immigrants has increased from 6.5 million in 1982 to 253 million in 2015.<sup>11,12</sup> As of 2015, one-third of migrant workers were women. Nevertheless, rural-to-urban migrants have faced considerable insecurity in terms of employment, income, health care, and social welfare under the Chinese long-term household registration system (*hukou*).<sup>13</sup> As an underprivileged and special population, reproductive-aged married female workers encounter numerous inequalities in society, such as long working hours, low wages, and insalubrious living conditions.<sup>14</sup> It was reported that the QOL of rural-to-urban female migrant workers was lower than that of Chinese women in general and governmental civil

employment.<sup>2,15</sup> It is already known that the decline in QOL of these underprivileged women would lead to negative outcomes (such as frequent health service used).<sup>14</sup> Because these women are separated from their husbands for a long time, the deprivation of a regular sex life, along with these sexual problems, might potentially negatively impact their QOL. To the best of our knowledge, the influence of sexuality on QOL among reproductive-aged married female workers has not yet been reported in southern China.

Existing studies on female sexual health have mainly focused on the prevalence and risk factors of sexual problems,<sup>16</sup> but little is known about the associations between sexual symptoms and QOL. In addition, there are no studies addressing the extent to which these sexual problems affect women's QOL.<sup>17</sup> Based on the above, we conducted this study to explore whether these sexuality-related factors were to some degree associated with the QOL and estimate their independent contributions to each domain of QOL among reproductive-aged married female migrant workers in southern China. Our study may extend the knowledge about sexual health and QOL of these underprivileged women and provide supporting information for health policy makers and healthcare providers in developing programs and delivering services to promote the health of this special population group in urban China.

## METHODS

### Study Design and Participants

A cross-sectional study was carried out between April–May 2013 in 3 light-industry factories without strong occupational health risk hazards in the Shenzhen-Dongguan economic zone in China, using a representative sample of 609 individuals via face-to-face interviews with trained personnel. The participants in this study were selected by a random stratified method without certain conditions such as depression, psychiatric disorders, cancer, and other diseases or the use of drugs (eg, alcohol, nicotine, narcotics, stimulants, antihypertensives, antihistamines, and others). All of the reproductive-aged married female migrant worker participants provided informed written consent; the study protocol was approved by the research ethics committee of Liaobu Community Health Service Center, Dongguan city.

### Procedures

All data were collected by well-trained medical female student interviewers from Guangzhou Medical University in the participants' rooms with structured questionnaires. To improve their investigation skills and unify the investigation methods, the interviewers received special training and engaged in regular group discussions and scene simulations.<sup>2,14</sup> The participants were first asked to report their sociodemographic and health-related information. Then, they completed a self-administered questionnaire that included sensitive sexuality-related items. To protect

**Table 1.** Association between QOL scores in physical and mental component summary among different subgroups (n = 609)

Variables	n (%)	PCS, mean (SD)	MCS, mean (SD)
<b>Cluster 1: Sociodemographic factors</b>			
Age groups (y)			
19–26 (1)	84 (13.8)	48.10 (11.64)	48.63 (10.78)
27–34 (2)	190 (31.2)	49.99 (9.18)	48.73 (9.66)
35–43(3)	229 (37.6)	49.92 (10.88)	50.46 (9.80)
≥44 (4)	106 (17.4)	51.70 (7.60)*	52.37 (9.95)*†
<i>P</i> value ( <i>F</i> statistics)		.107 (2.044)	.011 (3.751)
Education level			
Primary school or lower (1)	184 (30.2)	51.61 (9.52)	50.14 (10.06)
Junior high school (2)	348 (57.1)	49.89 (9.84)	50.27 (10.01)
Senior high school or above (3)	77 (12.6)	46.65 (11.06)*†	48.44 (9.82)
<i>P</i> value ( <i>F</i> statistics)		0.001 (6.851)	0.338 (1.087)
Work duration (year)			
<5 (1)	507 (83.3)	50.22 (9.89)	50.18 (9.91)
5–9 (2)	68 (11.2)	48.85 (10.46)	48.73 (10.94)
≥10 (3)	34 (5.6)	49.00 (10.87)	49.79 (9.43)
<i>P</i> value ( <i>F</i> statistics)		.475 (0.746)	.527 (0.641)
Monthly personal income			
<1,000 RMB/mo (1)	10 (1.6)	50.95 (8.31)	41.05 (16.41)
2,000–3,000 RMB/mo (2)	452 (74.2)	49.89 (9.80)	50.40 (9.75)*
>3,000 RMB/mo (3)	147 (24.1)	50.29 (10.73)	49.37 (10.01)*
<i>P</i> value ( <i>F</i> statistics)		.874 (0.135)	.009 (4.712)
<b>Cluster 2: Health-related factors</b>			
Self-reported chronic diseases			
No (1)	540 (88.7)	49.96 (9.99)	50.56 (9.87)
Yes (2)	69 (11.3)	50.31 (10.16)	45.59 (9.97)*
<i>P</i> value ( <i>t</i> value)		.788 (–0.269)	<.001 (3.939)
2-week morbidity			
No (1)	467 (76.7)	51.18 (8.80)	51.45 (9.46)
Yes (2)	142 (23.3)	46.11 (12.47)*	45.24 (10.28)*
<i>P</i> value ( <i>t</i> value)		<.001 (4.514)	<.001 (6.701)
Hospitalization in the last year			
No (1)	560 (92.0)	50.44 (9.51)	50.34 (9.87)
Yes (2)	49 (8.0)	45.02 (13.64)*	46.10 (10.78)*
<i>P</i> value ( <i>t</i> value)		<.001 (2.721)	.004 (2.863)
Gynecological diseases			
No (1)	375 (61.6)	50.40 (9.60)	51.36 (9.51)
Yes (2)	234 (38.4)	49.35 (10.60)	47.82 (10.39)*
<i>P</i> value ( <i>t</i> value)		.207 (1.263)	<.001 (4.309)
BMI			
Normal weight (1)	18 (3.0)	48.54 (12.06)	48.44 (8.84)
Underweight (2)	386 (63.4)	50.06 (9.81)	49.62 (10.33)
Overweight (3)	139 (22.8)	49.51 (10.26)	50.20 (10.24)
Obese (4)	66 (10.8)	51.08 (10.12)	52.23 (7.31)†
<i>P</i> value ( <i>F</i> statistics)		.683 (0.499)	.227 (1.450)
<b>Cluster 3: Sexuality-related factors</b>			
Lack of sexual interest			
Always (1)	59 (9.7)	50.60 (9.80)	48.50 (10.21)
Seldom (2)	173 (28.4)	48.26 (10.85)	46.57 (10.31)
Never (3)	377 (61.9)	50.70 (9.55)†	51.81 (9.38)*†
<i>P</i> value ( <i>F</i> statistics)		.026 (3.698)	<.001 (17.991)
Lubrication difficulties			

(continued)

Table 1. Continued

Variables	n (%)	PCS, mean (SD)	MCS, mean (SD)
Always (1)	48 (7.9)	47.42 (12.68)	46.98 (12.20)
Seldom (2)	168 (27.6)	48.12 (11.18)	46.97 (9.63)
Never (3)	393 (64.5)	51.12 (8.89)* <sup>†</sup>	51.66 (9.49)* <sup>†</sup>
<i>P</i> value ( <i>F</i> statistics)		.001 (7.154)	<.001 (16.067)
Sexual satisfaction			
Always (1)	381 (62.6)	50.24 (9.33)	51.71 (9.27)
Seldom (2)	113 (18.6)	49.69 (10.65)	45.80 (10.95)*
Never (3)	115 (18.9)	49.50 (11.45)	48.47 (9.98)* <sup>†</sup>
<i>P</i> value ( <i>F</i> statistics)		.736 (0.306)	<.001 (17.821)

BMI = body mass index; MCS = mental component summary; PCS = physical component summary; RMB = renminbi; (1) = reference group.

\*Compared with (1)  $P \leq .05$ .

<sup>†</sup>Compared with (2)  $P \leq .05$ .

the subjects' privacy, the survey was conducted via face-to-face interviews to avoid the effects of other roommates, and only female staff members were employed in our survey.

### SF-36 Questionnaire

The Short Form Healthy Survey (SF-36) was completed as a well-established measure of health-related QOL.<sup>18,19</sup> In our study, the Chinese version of the SF-36, which was translated from the standard English version, was used to evaluate the QOL of the reproductive-aged married female migrant workers, and it has shown satisfactory construct and clinical validity and internal consistency.<sup>20</sup> It was also specifically used to measure the full range of health status and well-being and was composed of 36 multiple-choice questions distributed among 8 subscales that can be combined into physical (PCS) and mental (MCS) component summary scores.<sup>18</sup> The PCS score describes physical health and comprises the physical functioning, role physical (RP), bodily pain (BP), and general health (GH) subscales. The MCS score describes mental health, including the vitality (VT), social functioning (SF), role-emotional, and mental health (MH) subscales. Scores range from 0 (worst)–100 (best), with high scores indicating better QOL. The PCS and MCS scores were calculated according to the report of Lam.<sup>21</sup>

### Sociodemographic Characteristics

Sociodemographic variables were obtained from the respondents directly. Age, work duration, and monthly personal income were self-reported as continuous variables and recorded as certain categories. Education level was measured by asking whether the respondents received a primary school or lower/junior high school or senior high school or above, as illustrated in Table 1.

### Health-Related Variables

Health-related factors included self-reported chronic diseases, 2-week morbidity, hospitalization in the last year, and gynecological diseases (Supplementary Table 1). Body mass index

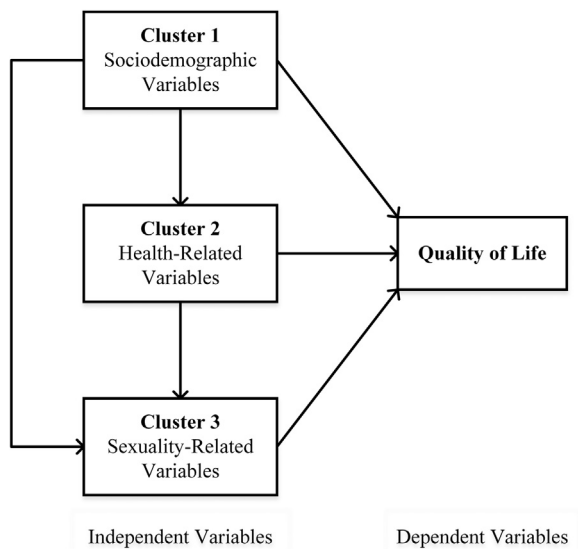
categories (underweight <18.5 kg/m<sup>2</sup>; normal weight 18.5–23.9 kg/m<sup>2</sup>; overweight 24.0–27.9 kg/m<sup>2</sup>; and obese  $\geq 28$  kg/m<sup>2</sup>) were calculated by dividing individuals' weight in kilograms by height in meters squared, according to the Chinese body mass index reference standard.<sup>22</sup>

### Sexuality-Related Factors

Sexuality-related factors were assessed using 3 items, representing the presence of feelings within the past several days or now, and are exhibited in Supplementary Table 1. The reasons we chose these 3 items were based on previous population-based studies, which found that, among the various sexual difficulties and complaints, the greatest prevalence rates lie in the lack of interest in sex, lubrication difficulties, and no experience of sexual satisfaction by using different questionnaires in various countries.<sup>6,23,24</sup> Additionally, we are aiming to explore whether there are differences between the different degrees of these sexual symptoms, so the responses for each item were obtained using a 4-point Likert scale (1 = always, 2 = often, 3 = seldom, and 4 = never). Finally, these responses were coded as 3 categories by combining the "always" and "often" as "always" responses (due to the low frequency of the "always" response). To properly assess the associations between the variables in the 3 clusters and QOL, we used dummy variables for disordered multicategory variables.

### Statistical Analysis

Data analyses were performed using SPSS 18.0 (Chicago, IL, USA). We assessed the association between sociodemographic, health-related, and sexuality-related variables and QOL scores using univariate and multivariate analyses. Univariate analyses included a *t* test and 1-way ANOVA, whereas multivariate analysis was performed by the clustered multiple linear regression analysis (enter model), where domain scores of the SF-36 instrument were considered as dependent variables and those variables in the three clusters were independent variables. A 2-sided statistical significance level of .05 was applied for all analyses.



**Figure 1.** The clustered multiple logistic regression model and multidirectional associations (the direction of the impact is indicated by the direction of the arrows)

Specifically, clustered multiple linear regression analyses<sup>25,26</sup> were used to explore the impacts of sociodemographic characteristics, health-related factors, and sexuality-related factors (3 clusters based on the nature of the study variables) on each domain of QOL. There was the possibility of multidirectional links among the 3 clusters of independent variables and the dependent variable, as shown in Figure 1. In other words, sociodemographic variables (cluster 1) may affect health-related variables (cluster 2) and sexuality-related variables (cluster 3) as well as the dependent variables (each domain of QOL). Similarly, cluster 2 may affect cluster 3 and the dependent variables. However, cluster 3 may only influence the dependent variables. Consequently, variables in the prior cluster may have impacts on variables in the subsequent cluster, but not vice versa.<sup>26</sup> We determined the final regression model in 3 steps, which were described in a previous study<sup>25</sup>: (i) an enter regression of each domain of QOL for the cluster 1 variables; (ii) an enter regression for the cluster 2 variables with the equation derived from step 1 as a fixed part of the new regression model; and (iii) an enter regression for the cluster 3 variables, with the equation derived from step 2 as a fixed part of the new regression model. The variables' entry and exclusion criteria for the enter regression models were *P* values of .05 and .10, respectively.

The independent effect of each cluster on the dependent variables was determined by calculating the corresponding  $r^2$  change. The independent contribution of each cluster was then calculated by (individual  $r^2$  change/total  $r^2$ )  $\times$  100%.<sup>27</sup>

## RESULTS

### Participant Characteristics

Of all the reproductive-aged married female respondents, only those who reported having sexual intercourse recently were

included in this study, with a response rate of 80.0%. In total, 609 respondents were included in the analyses, with their ages ranging from 19–49 years (mean age  $\pm$  SD of  $35.0 \pm 7.2$  years old). Overall, 87.3% of respondents had only received junior high school education or below. A total of 83.3% of the participants had been working in the factory for  $<5$  years. Only 24.1% of women had a salary exceeding 3,000 RMB per month (approximately \$450). With regard to the health conditions, most of them reported having no chronic disease (88.7%) or hospitalization in the last year (92.0%), more than one-third of participants (38.4%) experienced gynecologic diseases, and approximately one-quarter (23.3%) suffered from 2-week morbidity. In terms of sexuality, approximately 10.0% of the respondents always felt a lack of sexual interest and lubrication difficulties. More than one-third (37.5%) seldom or never experienced sexual satisfaction. More details of the participants' characteristics are exhibited in Table 1.

### Quality of Life in the Physical and Mental Dimensions

The SF-36 physical and mental component summary scores are shown in Table 1. The results obtained from univariate analyses indicated that the physical component summary was associated with education level, 2-week morbidity, hospitalization in the last year, and lack of sexual interest and lubrication difficulties (all  $P < .05$ ). However, the mental component summary was associated with age groups, monthly personal income, self-reported chronic diseases, two-week morbidity, hospitalization in the last year, gynecologic diseases, lack of sexual interest, lubrication difficulties and sexual satisfaction (all  $P < .05$ ). Apparently, there were significant associations between all sexuality-related variables and QOL in the mental component summary.

### Association between Sexuality-Related Factors and QOL in the Physical Domains Examined by Clustered Multiple Linear Regressions

To explore the relative importance of sexuality-related factors in predicting QOL and estimate their independent contributions to QOL, clustered multiple linear regressions were performed for each domain of QOL, as demonstrated in Tables 2 and 3. The domain scores were assigned as dependent variables, whereas the sociodemographic, health-related, and sexuality-related factors were independent variables. For the physical domains, after adjustment for variables in Clusters 1 and 2, sexuality-related variables were proven to be significant predictors of the RP, BP, and GH domains and PCS dimension. On these subscales, women who never felt lubrication difficulties obtained higher RP ( $\beta = 0.226$ ,  $P = .002$ ), BP ( $\beta = 0.187$ ,  $P = .006$ ), GH ( $\beta = 0.165$ ,  $P = .014$ ), and PCS ( $\beta = .176$ ,  $P = .017$ ) scores compared with those who always felt lubrication difficulties. Compared with those always experiencing sexual satisfaction, women who never experienced sexual satisfaction had relatively

**Table 2.** Clustered multiple linear regression models explaining physical domains of QOL by sociodemographic factors, health-related factors, and sexuality-related factors (n = 609)

Independent variables*	Beta <sup>†</sup>	P level	Adjusted R <sup>2‡</sup>	Independent contribution <sup>§</sup> %
<b>PCS</b>				
Cluster 1				
Senior high school or above	-0.130	.007		
Total			0.015	19.0
Cluster 2				
2-week morbidity	-0.200	<.001		
Hospitalization in the last year	-0.115	.004		
Total			0.069	68.4
Cluster 3				
Lubrication difficulties (never)	0.176	.017		
Total			0.079	12.6
<b>PF</b>				
Cluster 1				
Total			0.003	8.6
Cluster 2				
2-week morbidity	-0.092	.030		
Hospitalization in the last year	-0.152	<.001		
Total			0.029	74.3
Cluster 3				
Total			0.035	17.1
<b>RP</b>				
Cluster 1				
Total			0.008	11.0
Cluster 2				
2-week morbidity	-0.188	<.001		
Hospitalization in the last year	-0.083	.038		
Total			0.049	56.2
Cluster 3				
Lack of sexual interest (seldom)	-0.162	.018		
Lubrication difficulties (seldom)	0.161	.029		
Lubrication difficulties (never)	0.226	.002		
Sexual satisfaction (never)	-0.101	.014		
Total			0.073	32.8
<b>BP</b>				
Cluster 1				
Age groups (35–43)	0.134	.023		
Age groups (≥44)	0.130	.015		
Monthly personal income (2,000–3,000)	0.268	.033		
Monthly personal income (>3,000)	0.255	.042		
Total			0.010	4.5
Cluster 2				
2-week morbidity	-0.305	<.001		
Hospitalization in the last year	-0.110	.003		
Gynecological diseases	-0.138	<.001		
Total			0.187	79.4
Cluster 3				
Lack of sexual interest (seldom)	-0.154	.014		
Lubrication difficulties (never)	0.187	.006		
Sexual satisfaction (never)	-0.075	.048		
Total			0.223	16.1

(continued)

Table 2. Continued

Independent variables*	Beta <sup>†</sup>	P level	Adjusted R <sup>2‡</sup>	Independent contribution <sup>§</sup> %
GH				
Cluster 1				
Age groups (35–43)	0.159	.007		
Age groups ( $\geq 44$ )	0.185	.001		
Work duration (5–9)	–0.073	.050		
Total			0.039	17.1
Cluster 2				
Self-reported chronic diseases	–0.110	.004		
2-week morbidity	–0.217	<.001		
Hospitalization in the last year	–0.104	.004		
Gynecological diseases	–0.180	<.001		
Total			0.188	65.4
Cluster 3				
Lack of sexual interest (never)	0.133	.038		
Lubrication difficulties (never)	0.165	.014		
Sexual satisfaction (seldom)	–0.078	.045		
Sexual satisfaction (never)	–0.088	.020		
Total			0.228	17.5

BP = bodily pain; GH = general health; PCS = physical component summary; PF = physical functioning; QOL = quality of life; RP = role physical. Enter regression was applied in the multiple linear regression analysis.

\*Only variables with  $P \leq 0.05$  were included in the model.

<sup>†</sup>Beta is the standardized regression coefficient derived from the multiple linear regression, indicating the change in standard units of dependent variable for each increase of one standard unit in the independent variable, controlling for all other independent variables.

<sup>‡</sup>R<sup>2</sup> is the proportion of variance in the dependent variable (each domain of QOL) explained by the independent variables included in each regression model.

<sup>§</sup>The independent contribution of each cluster of predictors to the variation in each domain of QOL calculated as individual corresponding R<sup>2</sup> change/total R<sup>2</sup> change in each final model  $\times 100\%$ .

lower RP ( $\beta = -0.101$ ,  $P = .014$ ), BP ( $\beta = -0.075$ ,  $P = .048$ ), and GH ( $\beta = -0.088$ ,  $P = .020$ ) scores. Furthermore, the independent contributions of sexuality-related variables in these domains were 32.8%, 16.1%, 17.5%, and 12.6%, respectively.

### Association between Sexuality-Related Factors and QOL in the Mental Domains Examined by Clustered Multiple Linear Regressions

Meanwhile, for the mental domains, sexuality-related variables were proven to be significant predictors of the VT and MH domains and MCS dimension (Table 3). Notably, on the 2 subscales and mental component summary scales, women who never felt lubrication difficulties obtained higher scores ( $\beta = 0.184$ ,  $P = .012$ ;  $\beta = 0.163$ ,  $P = .022$ ;  $\beta = 0.180$ ,  $P = .009$ ) compared with those always feeling lubrication difficulties, and women who never or seldom experienced sexual satisfaction had lower scores ( $\beta = -0.139$ ,  $P = .001$ / $\beta = -0.137$ ,  $P = .001$ ;  $\beta = -0.189$ ,  $P < .001$ / $\beta = -0.133$ ,  $P = .001$ ;  $\beta = -0.159$ ,  $P < .001$ / $\beta = -0.148$ ,  $P < .001$ ) than those who always experienced sexual satisfaction. In addition, the independent contributions of sexuality-related variables in these domains were 50.0%, 52.4%, and 39.5%, respectively (more than all sociodemographic and health-related variables in the VT and MH domains). The independent contributions of the mentioned 3 clusters to the QOL of reproductive-aged married

female migrant workers in physical and mental domains are illustrated in Figure 2.

## DISCUSSION

This study explored the associations of sexuality-related factors and QOL in reproductive-aged Chinese married female migrant workers. In our study, after adjusting for sociodemographic and health-related factors, sexuality-related factors (lubrication difficulties and sexual satisfaction) were significantly associated with certain domains of QOL, especially mental domains. Moreover, the independent contributions of sexuality-related factors were larger than those of all sociodemographic and health-related variables in 2 mental domains (VT and MH). The strong associations between the mental domains of QOL and sexuality-related factors suggested that sexuality may be a major determinant of mental health of Chinese reproductive-aged married female migrant workers.

We found that sexuality-related factors (lubrication difficulties and sexual satisfaction) were significantly associated with the QOL of reproductive-aged Chinese married female migrant workers after adjusting for sociodemographic and health-related factors. Women who never felt lubrication difficulties had higher RP, BP, GH, and PCS scores in physical domains and higher VT, MH, and MCS scores in mental domains compared

**Table 3.** Clustered multiple linear regression models explaining mental domains of QOL by sociodemographic factors, health-related factors, and sexuality-related factors (n = 609)

Independent variables*	Beta <sup>†</sup>	P level	Adjusted R <sup>2‡</sup>	Independent contribution <sup>§</sup> %
<b>MCS</b>				
Cluster 1				
Age groups(35-43)	0.147	.014		
Age groups(≥44)	0.176	.001		
Monthly personal income (2000–3000)	0.355	.006		
Monthly personal income (>3000)	0.313	.014		
Total			0.026	13.0
Cluster 2				
Self-reported chronic diseases	−0.097	.013		
2-week morbidity	−0.182	<.001		
Gynecological diseases	−0.105	.006		
Total			0.121	47.5
Cluster 3				
Lubrication difficulties (never)	0.180	.009		
Sexual satisfaction (seldom)	−0.148	<.001		
Sexual satisfaction (never)	−0.159	<.001		
Total			0.200	39.5
<b>VT</b>				
Cluster 1				
Age groups (35–43)	0.139	.030		
Age groups (≥44)	0.183	.002		
Total			0.012	13.6
Cluster 2				
2-week morbidity	−0.120	.004		
Total			0.044	36.4
Cluster 3				
Lubrication difficulties (never)	0.184	.012		
Sexual satisfaction (seldom)	−0.137	.001		
Sexual satisfaction (never)	−0.139	.001		
Total			0.088	50.0
<b>SF</b>				
Cluster 1				
Monthly personal income (2000–3000)	0.282	.038		
Total			0.014	15.7
Cluster 2				
2-week morbidity	−0.099	.016		
Total			0.034	22.5
Cluster 3				
Total			0.089	61.8
<b>RE</b>				
Cluster 1				
Age groups (35–43)	0.130	.044		
Age groups (≥44)	0.144	.014		
Senior high school or above	−0.123	.011		
Total			0.037	54.4
Cluster 2				
Self-reported chronic diseases	0.097	.021		
2-week morbidity	−0.150	<.001		
Total			0.063	38.2
Cluster 3				
Total			0.068	7.4

(continued)



Table 3. Continued

Independent variables*	Beta <sup>†</sup>	P level	Adjusted R <sup>2‡</sup>	Independent contribution <sup>§</sup> %
MH				
Cluster 1				
Age groups ( $\geq 44$ )	0.113	.045		
Monthly personal income (2000–3000)	0.395	.003		
Monthly personal income ( $> 3000$ )	0.319	.016		
Total			0.019	13.3
Cluster 2				
2-week morbidity	−0.149	<.001		
Total			0.068	34.3
Cluster 3				
Lubrication difficulties (never)	0.163	.022		
Sexual satisfaction (seldom)	−0.133	.001		
Sexual satisfaction (never)	−0.189	<.001		
Total			0.143	52.4

MCS = mental component summary; MH = mental health; QOL = quality of life; RE = role-emotional; SF = social functioning; VT = vitality.

Enter regression was applied in the multiple linear regression analysis.

\*Only variables with  $P \leq .05$  were included in the model.

<sup>†</sup>Beta is the standardized regression coefficient derived from the multiple linear regression, indicating the change in standard units of dependent variable for each increase of 1 standard unit in the independent variable, controlling for all other independent variables.

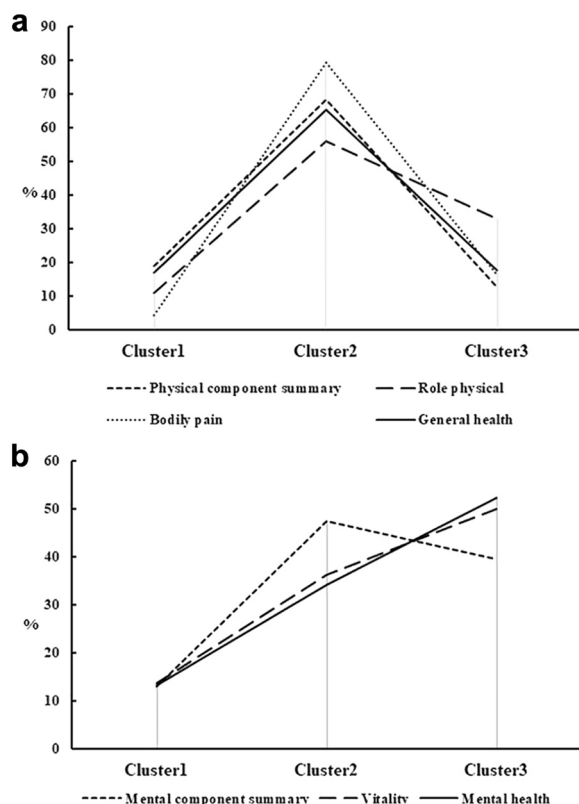
<sup>‡</sup>R<sup>2</sup> is the proportion of variance in the dependent variable (each domain of QOL) explained by the independent variables included in each regression model.

<sup>§</sup>The independent contribution of each cluster of predictors to the variation in each domain of QOL calculated as individual corresponding R<sup>2</sup> change/total R<sup>2</sup> change in each final model  $\times 100\%$ .

with women who always felt lubrication difficulties. The results were consistent with one study in England conducted in the general population aged 18 to 75 years.<sup>28</sup> Their study suggested that age and psychological status (such as anxiety and depression) were the most strongly associated with vaginal dryness. A community-based survey conducted in Hong Kong among a population of 1,518 married women aged 21–49 found that women who reported lubrication difficulties were more likely to be unsatisfied with their life.<sup>6</sup> Unlike low sexual desire or interest, the uncomfortable physical impact associated with lubrication difficulties should not be ignored or regarded as an acceptable sexual problem.<sup>29</sup> Women were considered to have a passive role in sexual activity at all times. When they encounter these sexual problems, a considerably high proportion might choose to be silent and not communicate their feelings to someone in a suitable way and are unlikely to seek medical assistance. Over time, these issues will aggravate stress tolerance, which can consequently induce a series of endocrine responses or turbulence and damage their physical health.<sup>3,30</sup> In the following study, more investigations using validated questionnaires are needed to collect a detailed assessment of the characteristics of sexual distress caused by sexual problems. Although many studies have assessed the prevalence and treatment of vaginal dryness in menopausal women, very few reports have explored the degree to which they are bothered by lubrication difficulties. Our study suggested that lubrication difficulties had a negative effect on QOL in both the physical and mental domains of reproductive-aged married female workers, which reminded us that these social problems deserve more attention regarding the sexual health of

female migrant workers. It also indicates that appropriate and imperative propaganda and education on sexual problems are important for this special population group.

In this study, women who never experienced sexual satisfaction had lower RP, BP, and GH scores in physical domains; women who never or seldom experienced sexual satisfaction had lower VT, MH, and MCS scores in mental domains compared with those who always experienced sexual satisfaction. The abovementioned findings corresponded with an earlier study, which showed that sexual dissatisfaction was positively associated with life dissatisfaction and adversely affected the quality of life in this female population.<sup>6</sup> A community-based study among 349 women aged 18–65 years reported that women who felt sexually satisfied had higher overall well-being and vitality scores compared with sexually dissatisfied individuals.<sup>31</sup> However, some sociodemographic parameters that might relate to QOL were not included as confounding factors in their analyses. A descriptive study of 127 middle-aged and elderly Jewish women also demonstrated a particularly strong positive correlation between sexual satisfaction and life satisfaction.<sup>32</sup> Although the sexual problem in these studies was shown to be commonly associated with mental health, they did not use a standardized questionnaire to measure its influence on participants' QOL. Disharmonious relationships caused by sexual dissatisfaction will undoubtedly put considerable pressure on married women, thereby possibly affecting their mental and physical function. A cross-sectional population-based survey of 31,581 adult women in the United States indicated that sexual dissatisfaction was positively associated with sexual distress (measured with the Female Sexual



**Figure 2.** Panel A shows the independent contributions of the 3 clusters to the physical domains of QOL (physical component summary, role physical, bodily pain, and general health). Panel B shows the independent contributions of the 3 clusters to the mental domains of QOL (mental component summary, vitality, and mental health). QOL = quality of life.

Distress Scale), and the more dissatisfied they were with their sexual life, the higher was their distress score.<sup>33</sup> All of these findings reinforced the importance of addressing sexual satisfaction as an essential component of the overall well-being of women. Further studies are needed to understand more profound associations between sexual satisfaction and QOL, and a standardized scale should be used to identify the role of psychosocial indicators (sexual distress and partner relationship) among reproductive-aged married female migrant workers. Furthermore, this study found that the rate of seldom or never experiencing sexual satisfaction was 37.5%, which was much higher than that previously found among Hong Kong reproductive-aged married women (10.5%).<sup>6</sup> A possible explanation may lie in the different forms of questionnaire items; they used a dichotomous response format, whereas we used a tri-class variable format for sexuality-related items. In addition, socioeconomic and educational factors might be linked to different attitudes about sex and different patterns of male-female relationships, particularly in women. Women with high education and economic status usually have liberal values and better knowledge. However, for women in a low-paid or unrewarding

state, sex may be regarded as a wifely duty, so they might have low self-esteem and be likely to feel negative about their sexual requirements. Undoubtedly, there were significant gaps between Hong Kong and mainland China in socioeconomic and educational environments. Our research populations were the underprivileged female migrant workers in the factory, and the majority of them were of low economic status and had a low education level. Similarly, the American National Health and Social Life Survey investigated a national sample of 1,749 women and 1,410 men aged 18–59 and found that both women and men with lower educational attainment reported less pleasurable sexual experience and elevated levels of sexual anxiety.<sup>7</sup> Therefore, it is of great importance for female migrant workers to master and learn about some health literacy; in addition, effective measures should be carried out to improve their economic conditions and social welfare.

Our results also indicated that the independent contributions of the third cluster (sexuality-related factors) to 2 mental domains of QOL (VT and MH) were even larger than those of socio-demographic and health-related factors. This finding might be partially explained by the fact that sexuality was a major determinant in mental health for reproductive-aged married female migrant workers. In Dunn KM's study, strikingly different associations of sexual problems were observed in men and women. They found that physical factors were the most consistent determinant of male problems, whereas psychological factors were strongly linked to female problems.<sup>28</sup> Women in our study were sexually active reproductive-aged married workers, and the great influence of sexuality on their mental health might be attributed to multiple pressures from work, family, the economy, and society. In this case, a harmonious partner relationship would be more important for them. Raymond revealed that compared with women with low desire or interest who do not have a partner, those in a partner relationship with low desire or interest had higher distress.<sup>33</sup> The results of the research indicated that the most relevant correlates of sexual distress were psychological and partner relationship factors, which echoed the results of our research to some extent. As we mentioned above, sexual distress might be closely related to married women's mental health. To promote the physical and mental health of reproductive-aged women, scales indexing sexual distress and relationship quality should be included in future studies to provide more accurate and detailed information.

### Limitations

This study has several limitations that should be noted. First, the data in our analyses were based on self-reports, which could lead to biases or inaccuracies. Second, this was a cross-sectional study, so the observed associations should not be assumed to be causal relationships. Further in-depth studies with longitudinal follow-up data are warranted to explore the cause-effect relationships.

## CONCLUSION

In conclusion, this is the first population-based study concerning sexuality-related factors and QOL of individuals in female groups, where the focus was on reproductive-aged Chinese married female migrant workers. We found that QOL was, to some degree, independently and differentially affected by sexuality-related factors (lubrication difficulties and sexual satisfaction). With the significant associations between sexuality-related factors and female QOL (especially in mental domains), there might be great implications for highlighting the importance of sexuality-related health and promulgating relevant service policies to enhance these underprivileged migrant workers' sexual health, thus improving their mental health and QOL.

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#### SUPPLEMENTARY DATA

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