



# Discrimination and Quality of Life Among Marriage-Squeezed Men in Rural China: Unexpected Functions of Structural and Functional Social Support

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## Abstract

In rural China, marriage-squeezed men are more likely to experience discrimination than other males. Using data collected from Anhui Province in China on marriage-squeezed men's quality of life, this study examines the influence of discrimination on the quality of life and the buffering effect of social support among this cohort. The results show that discrimination is a strong stressor, and its negative consequences on marriage-squeezed men's quality of life are difficult to eliminate, with social support having a limited buffering effect. Meanwhile, structural support and functional support had different functions on quality of life of marriage-squeezed men experiencing discrimination. Whereas structural support had no significant main effect on quality of life, interaction with relatives and neighbors had a buffering effect on the relationship between discrimination and quality of life. In contrast, functional support, particularly from family members, relatives, and neighbors, had positive main effects on quality of life; however, no buffering effect was observed. The findings affirm that discrimination must be addressed as an independent and important factor. Promoting marriage-squeezed men's social ties outside the family can reduce the damaging effect of discrimination, while future research needs to seek other protective resources to maintain the men's quality of life.

**Keywords** Marriage-squeezed men · China · Discrimination · Social support · Quality of life · Wellbeing

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## 1 Introduction

Some Asian countries, such as China, South Korea, and India, have a sex ratio at birth that is more male-biased than the world average, with China presenting the most severe ratio of the three. Since the mid-1980s, China's one-child policy and son preference have caused a sharper gender imbalance than in other countries (Jiang et al., 2016; Zhou & Hesketh, 2017). It is estimated that there are already 33 million surplus men across the country. The ratio of never-married males to never-married females reached 150:100 in 2020 and this divide is expected to continue growing until 2050. After 2044, more than 10% of men aged 50 are projected to never get married (Jiang et al., 2014). Thus, men face increasing competition in the marriage market, particularly in remote and impoverished rural areas. This problem is intensified due to the outmigration of single women, coupled with the practice of hypergamy where women of lower socioeconomic status marry men of higher socioeconomic status (Eklund & Attané, 2017; Jiang et al., 2016). The shortage of women has also resulted from decades of shrinking birth cohorts in combination with age hypergamy, where men are typically older than their female partners. The 2010 census reported that among 30- to 39-year-olds who have never been married, the sex ratio of men to women in rural areas is as high as 411:100, much higher than the national average ratio of 278:100 (PCO, 2012). Moreover, in the rural marriage market, the bride price has risen sharply. Therefore, rural males with low social status and less educational capital and material assets are forced to adjust their mate selection criteria and strategies, and delay or even permanently abandon the prospect of marriage (Attané & Yang, 2018; Zhou & Hesketh, 2017). These so-called "marriage-squeezed men" are defined in this study as men who have experienced or are experiencing difficulties in finding a spouse (Wang et al., 2018; Yang et al., 2020).

Studies suggest that rural marriage-squeezed men suffer more stress and have lower levels of self-confidence, life satisfaction, and quality of life, and higher levels of depression and greater risk of suicide than non-marriage-squeezed men (Attané & Yang, 2018; Li & Li, 2011; Wang et al., 2018; Yang et al., 2020; Zhou & Hesketh, 2017; Zhou et al., 2011). Quality of life is a multidimensional construct that involves various domains of life. The World Health Organization (WHO) defines it as an individual's perception of their position in life in the context of their culture and value systems and in relation to their goals, expectations, standards, and concerns (WHOQOL Group, 1998). Social discrimination may be an important contextual factor that contributes to disparities in quality of life for marriage-squeezed men. Marrying and forming a family are societal norms in China (Attané & Yang, 2018); therefore, rural men who remain unmarried beyond a certain age, as well as their families, are usually stigmatized as "abnormal," "incapable," and "losers" (Yang et al., 2020; Zhou et al., 2011). Mass media, researchers, and the government tend to regard such men as a high-risk group, the assumption being that they are prone to anti-social behavior and criminal activity due to lack of family restraint, thereby threatening security and stability (Jin et al., 2012). A survey conducted in rural China showed that quality of life of bachelors who felt stigmatized is significantly poorer than that of men who did not feel stigmatized (Attané & Yang, 2018).

However, previous research has not identified which resources can alleviate the negative effect of discrimination on quality of life for marriage-squeezed men. Social support has been found useful for individuals to cope with and manage the effects of stress (Liu et al., 2014; Uchino, 2009). In addition to directly enabling individuals to achieve optimal health and longevity, social support can also alleviate the physiological and psychosocial reaction

to stress, thereby producing a protective effect (Cohen, 2004; Helgeson, 2003; Lakey & Cronin, 2008). Therefore, social support can serve as a buffer against the detrimental effects of discrimination. The definition of social support varies widely, but research has made a key conceptual distinction between *structural* support and *functional* support (Cohen et al., 2001; Uchino, 2009; Verheijden et al., 2005). Structural support measures the existence of social relationships, such as the size and composition of social networks, and frequency of contact. Functional support measures the quality of support and is usually conceptualized as perceived social support (Helgeson, 2003; Lakey & Cohen, 2000). Research has shown that the impact of perceived support and the size or composition of social networks on health is quite separate (Bushman & Holt-Lunstad, 2009). It is believed that perceived support has been more reliably associated with health and wellbeing than the structural aspects of social networks (Cohen, 2004; Uchino, 2009). However, the empirical results are equivocal (Ajrouch et al., 2010; Jasinskaja-Lahti et al., 2006; Li & Li, 2011; Seawell et al., 2014; Su et al., 2013). Thus, a large body of literature has focused on indicators of structural and functional social support to understand which types of support can produce greater significant influences on health and wellbeing (Uchino, 2009; Uchino et al., 2012).

Researchers contend that cultural differences across countries can influence individuals' perception of and intention to use social support (e.g., Beehr & Glazer, 2001; Shavitt et al., 2016; Taylor et al., 2007). Rural China is a society of acquaintances; it is more collectivistic and *guanxi* (relationship) oriented relative to Western countries. *Guanxi* is an essential element of Chinese culture and occupies a special position in every individual's life (Gold et al., 2002). People consciously manage and maintain their relationships by actively participating in events that involve a social exchange, such as weddings or funerals (Gold et al., 2002). In this cultural context, however, existing research has rarely focused on exploring the influences of positive and negative social relationships on quality of life for marriage-squeezed men. Therefore, this study attempts to test the impact of discrimination and explore whether social support has a positive buffering effect on quality of life of this group when they experience discrimination, including whether perceived functional support produces a better influence than structural support. The results could contribute to designing interventions that promote the wellbeing of marriage-squeezed men.

## 2 Literature Review

Attané and Yang (2018) surveyed rural areas of Shaanxi Province and reported that two-thirds (68.1%) of people would gossip about bachelors known to them. The researchers also reported that nearly half (45.1%) of bachelors believed they were excluded from society, while 65.4% felt stigmatized due to their status as bachelors (Attané & Yang, 2018). Yang et al. (2020) also found that, among marriage-squeezed men, the probability and frequency of experiencing discrimination is much higher than among married men in rural Anhui. However, in terms of quality of life of marriage-squeezed men, existing studies have mainly examined the influences of personal and family factors, such as the possibility of marriage, family pressure, social relationships and support, sex life, and socioeconomic factors (Attané & Yang, 2018; Li & Li, 2011; Wang et al., 2018; Yang et al., 2017). They have not considered the detrimental effects of discrimination.

## 2.1 Relationship Between Discrimination and Quality of Life

Discrimination is a practice that differentiates an individual or a group based on certain traits and characteristics, often to an individual's disadvantage. Frequent exposure to discrimination can make individuals feel excluded from mainstream society, leading to negative behaviors and thoughts, and a significant reduction in their expectations for the future (Seawell et al., 2014; Su et al., 2013). Over the past two decades, research examining the effects of discrimination on mental and physical health has increased dramatically. Western studies on immigrants and ethnic and other minority groups widely suggest that discrimination experiences can harm individuals' physical and mental health in a variety of ways, including causing adverse physical and psychological reactions such as high blood pressure, increased negative emotions, reduced individual self-control resources, and increased participation in unhealthy behaviors (Koskinen et al., 2015; Pascoe & Smart Richman, 2009). Measurements of quality of life reflect and capture an individual's current life situation, linking satisfaction with physical and mental health, social relations, and living circumstances (WHOQOL Group, 1998). Unsurprisingly, therefore, studies of these groups have also found that discrimination is significantly and negatively associated with quality of life (Otiniano & Gee, 2012; Sevillano et al., 2014).

However, the minorities in western studies do not feel embarrassed or inferior to their own group, which means the discrimination mainly causes external and single-level harm. In contrast, for marriage-squeezed men in rural China, being squeezed in the marriage market represents first level harm, which leads to a series of internal negative emotions. Discrimination may further reinforce the detrimental effect of marriage squeeze and double the pressure, which will worsen their quality of life. However, few studies have attempted to examine the impact of discrimination on the quality of life of marriage-squeezed men.

## 2.2 The Relationship Between Discrimination, Social Support, and Quality of Life

Many studies have confirmed the relationship between social support and health, and two models have been developed to explain this connection. The main effect model claims that social support has a beneficial effect on health, regardless of whether the individual is under stress. Whereas the stress-buffering hypothesis posits that, in the presence of stress, social support can play a role in protecting an individual's health by decreasing the occurrence of stressful events, easing stressors, and preventing the individual from exhibiting detrimental physical, psychological, and behavioral reactions (Cohen, 2004). Structural support and functional support may have distinct associations with the quality of life of marriage-squeezed men (Shavitt et al., 2016).

### 2.2.1 The Relationship Between Discrimination, Structural Support, and Quality of Life

Researchers believe that when faced with the pressure of perceived discrimination and related experiences of inequality, social support at the emotional level is the most effective buffer for successfully mitigating negative effects on health outcomes (Jackson et al., 2003; Koskinen et al., 2015). Meanwhile, research also shows that diversity of network composition is a stronger predictor of health outcomes than network size and frequency of contact (Vogt et al., 1992). Therefore, this study gives priority to measuring structural characteristics of emotional support networks and selects network composition as a proxy

indicator. Groupings of network members are an efficient measure because they not only reflect an individual's interpersonal relationship in the living environment, but also represent the degree of intimacy with network members and provide a useful means for tracing the development of support networks (Litwin, 1997).

Many previous studies support the main effect of structural support, believing the existence of relationships (e.g., family members, relatives, neighbors, and friends) is beneficial for health-related quality of life because these relationships cultivate a better mood, provide a sense of identity and a source of companionship, and promote healthy behaviors (Cohen, 20,014; Gouveia et al., 2016; Helgeson, 2003; Umberson & Karas Montez, 2010). A study in China on marriage-squeezed males suggested that the structural aspects (network size and composition) of support networks that provide practical support or daily social interaction were beneficial to quality of life for this group (Wang et al., 2018). That is, the diverse composition of emotional support networks may also be positively associated with quality of life of marriage-squeezed men.

Meanwhile, theoretical research generally claims that structural support does not align with the stress-buffering hypothesis (Cohen, 2004; Helgeson, 2003). Some empirical studies support this theoretical claim. For example, a study on elderly black Americans found that the frequency of contact with network members had no significant buffering effect on the relationship between perceived discrimination and depressive symptoms (Marshall & Rue, 2012). However, some studies on ethnic groups found the opposite and suggested that structural characteristics of support (e.g., frequency of contact and network composition) could attenuate the association between perceived discrimination or stigmatization and psychological well-being (Ikram et al., 2016; Jasinskaja-Lahti et al., 2006; Mueller et al., 2006). Receiving attention, love, and care from network members can effectively reduce an individual's negative emotions and physiological responses, allowing better adaptation to stressful situations (Uchino, 2009).

### 2.2.2 The Relationship Between Discrimination, Functional Support, and Quality of Life

In fact, most existing studies on the relationship between discrimination and health only examine the effect of perceived support, because researchers generally believe it can play a protective role against health problems (e.g., Ajrouch et al., 2010; Seawell et al., 2014; Su et al., 2013). This study used perceived support as a proxy indicator of functional support, which refers to the subjective perception that individuals can receive support from family, relatives, neighbors, and friends (Zimet et al., 1988).

Theoretical research also assumes that functional support has a main effect on health (Cohen, 2004; Helgeson, 2003). Perceived support is recognized as the most effective factor in predicting physical and mental health among all social support variables (Cohen, 2004; Helgeson, 2003; Turner & Brown, 2010). Almost all studies have suggested that perceived support is directly and positively related to health-related quality of life (Holt-Lunstad et al., 2010; Pinquart & Duberstein, 2010). Similarly, research on rural forced bachelors also confirmed that total perceived support had a direct and significant effect on their depressive symptoms and life satisfaction (Li & Li, 2011). Therefore, it can be inferred that total perceived support has a main effect on quality of life of marriage-squeezed men.

Theoretical research claims that perceived support has a stress-buffering effect. When used to assess the perception of available interpersonal resources, perceived support can influence quality of life by altering how an individual appraises stressful events, meeting the

psychological needs triggered by stressful events, and reducing physiological stress responses to expected or current stressors (Cohen, 2004; Helgeson, 2003; Turner & Brown, 2010). Some empirical studies on ethnic groups, immigrants, and disabled people supported this claim and suggested that perceived support could mitigate the negative effects of discrimination. Having a high level of perceived support could effectively relieve tensions and enable individuals to better cope with stress (Chou, 2012; Itzick et al., 2018; Trujillo et al., 2017). However, some empirical studies on vulnerable groups did not support this evidence, and found that increasing the level of perceived support could not offset or buffer the stressful consequences of perceived discrimination (Ajrouch et al., 2010; Prelow et al., 2006; Su et al., 2013).

### 3 Current Study

In summary, discrimination may cause a more serious harmful effect for marriage-squeezed men than for minority groups in western studies. However, research on this group has seldom focused on discrimination, regarding it as a major pressure. Meanwhile, no previous research has explored how to alleviate its negative influence. The existing literature suggests that the buffering effects of structural/functional support on the association between discrimination and health are inconsistent across cultural and minority groups (e.g., Ajrouch et al., 2010; Jasinskaja-Lahti et al., 2006; Su et al., 2013; Trujillo et al., 2017). Conflicting findings mean we cannot infer which types of support can moderate the relationship between discrimination and quality of life for marriage-squeezed men.

Moreover, researchers also suggest it is necessary to distinguish between relationship types in the support network because each relationship (e.g., family members, relatives, and friends) provides different resources and specialized support (Litwin, 1997). For marriage-squeezed men, family members are an important component of support networks. It is common for parents or siblings to voluntarily support adult children or brothers. Due to blood ties, relatives are reliable and stable sources of active and intimate relationships. Research also suggested that compared with married men, marriage-squeezed men are more inclined to interact with fellow villagers (Li & Li, 2011). They exchange gifts with neighbors on festival days to maintain good relationships (*guanxi*) and to avoid isolation. A survey on this group has suggested that the importance to quality of life of kin and non-kin ties within support networks providing practical support or daily social interaction are unequal (Wang et al., 2018). In other words, the buffering role of different sources of social support on quality of life may vary when marriage-squeezed men suffer discrimination. However, no studies have explored the moderating effects of distinct sources of support on the relationship between discrimination and quality of life for marriage-squeezed men.

This study extends the literature by (1) examining the effect of discrimination on the quality of life of marriage-squeezed men; and (2) exploring whether the negative effects of discrimination can be mitigated by providing marriage-squeezed men with social support, and identifying which types and sources of support should be prioritized.

## 4 Method

### 4.1 Survey Procedure

All survey procedures were approved by the academic committee at the second author's university. The survey was conducted in rural areas of Chaohu City, Anhui Province in January 2015. According to the 2010 census, the male to female ratio in the unmarried population aged 15 years and over in rural Chaohu was 164:100. This ratio is much higher than the average rural level of Anhui (140:100) and the whole country (149:100).

Research has found that rural men's age at first marriage generally does not exceed 28 years, and once this threshold is surpassed, the possibility of finding a wife drops sharply (Yang et al., 2011). Therefore, when designing the survey plan, we tended to include at least four subgroups: married/unmarried men aged 20–27 years and married/unmarried men aged 28–65 years. This allowed the researchers to quickly grasp the composition of the sample and avoid too few marriage-squeezed men.

The survey utilized stratified sampling. The research team divided the 18 townships and subdistricts under the jurisdiction of Chaohu City into four groups according to level of economic development, and then selected one township from each group. Next, we randomly selected six administrative villages from each township, for a total of 24 villages, and randomly chose 9–12 respondents from each of the four categories of men per village.

The survey was completed with the assistance of the Municipal Health and Family Planning Bureau (the Health Commission) and the staff from four township governments. The staff took the investigators to the selected village and asked village leaders to help contact interviewees and provide a venue. The investigators were then solely responsible for the ensuing investigation. First, each interviewee was asked if they would be willing to participate in the investigation; the investigators promised to protect their private information and informed them of their right to withdraw at any time. After obtaining consent from the interviewees, the investigators distributed the questionnaire and asked them to complete it on the spot, so that any questions could be answered promptly. Once the questionnaires had been completed, the investigators collected them immediately and gave each respondent a small gift. Responses were received from 1053 men, including 22.70% unmarried and 14.53% married men under the age of 28, and 23.46% unmarried and 39.32% married men over 28.

### 4.2 Measurement

#### 4.2.1 Dependent Variable: Quality of Life

This study adopted the abbreviated version of the World Health Organization Quality of Life scale (WHOQOL-BREF) to measure the quality of life of marriage-squeezed males. This scale comprises a total of 26 items, including 2 general items for measuring overall quality of life and generic health and 24 items covering four domains: physical health (7 items), psychological health (6 items), social relations (3 items), and environment (8 items). Items are rated using 5-point Likert scales to assess intensity, capacity, frequency, or satisfaction. The WHOQOL-BREF questionnaire has been translated into multiple languages and has excellent reliability and internal consistency in clinical practice and cross-cultural comparative research (Hsiao et al., 2014). In this study, this measure also had a

high internal consistency (Cronbach's  $\alpha=0.86$ ). After reversing scores for the three negative items, the total quality of life score was calculated by adding together the scores of all items. A higher score indicates higher quality of life.

#### 4.2.2 Independent Variables: Discrimination and Social Support

*Discrimination* This study employed a self-report method to ask respondents "Have you ever been looked down upon in work or life, such as [with] verbal ridicule and insult?" The answers include: 0=no; 1=yes, infrequently; 2=yes, often.

*Structural support* Drawing on Van der Poel's (1993) social support questionnaire, this study asked respondents a multiple-choice question to measure individuals' interaction with network members: "When you are in a bad mood due to certain problems, such as arguing with others and encountering setbacks in life, who do you often talk to?". Respondents could select from seven types of relationships: family members, relatives, neighbors, friends, leaders and colleagues, internet friends, and others. If the respondent answered that there was no one, all options were marked as 0. This study measured the number of relationship types (network composition diversity) and distinguished who respondents often interact with (composition).

*Network Composition Diversity* Each of the above seven relationships was assigned one point. Network composition diversity was computed by adding the scores of the seven relationships, ranging from 0 to 7. A higher score indicates having more arenas of interaction in the support network and greater degree of social participation.

*Composition* Based on the geographical scope of marriage-squeezed men's daily activities and the strength of their social ties, this study integrated the above seven relationships into three groups: family members, relatives and neighbors, and friends and others (including leaders and colleagues and internet friends). Each group of relationships comprised a binary variable, coded as 1 (exists) or 0 (does not exist).

*Functional support* The widely used Multidimensional Scale of Perceived Social Support (MSPSS) consists of 12 items that evaluate the subjective perception of available support from three sources: family members, friends, and significant others (Zimet et al., 1988). The present study employed this measure to assess the perceived support from family members, friends, and relatives and neighbors. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). First, this study measured the *total perceived support* by adding the scores of the 12 items. The scores ranged from 12 to 60, with a higher score indicating the perception that more social resources are available. The internal consistency coefficient of the overall scale was excellent in this study (Cronbach's  $\alpha=0.92$ ).

This study then separately calculated the *perceived support from family members, friends, and relatives and neighbors* by adding the scores of items for the three sources. A higher score indicates the perception that more support is available from the corresponding source. The Cronbach's alpha values of the three subscales were 0.82, 0.82, and 0.84, respectively.

#### 4.2.3 Control Variables

Three control variables were specifically designed to reflect the marriage squeeze situation of rural men.



*Perceived marriage squeeze* This variable was measured by asking never-married men “Do you feel that it would be difficult for you to get married?” and asking married men “Did you ever feel that it would be difficult for you to get married?” The answers were coded as either 0 = “no” or 1 = “yes.”

*Age* Calculating the lifetime marriage rates in one region revealed that 50 years of age is often regarded as a watershed moment. This age represents the transition from middle to old age and withdrawal from the marriage market. Therefore, to collect more information, men’s ages were divided into three groups: 20–27 years (coded as 1), 28–49 years (coded as 2), and 50–65 years (coded as 3).

*Marital status* Depending on whether men have ever been married, this study classified marital status into two categories: 0 = married (including married, divorced, and widowed), 1 = never married.

This study also incorporated some socioeconomic factors as control variables. Specifically, educational attainment was coded as 0 = primary school and below, 1 = junior high school, and 2 = senior high school and above. Annual income was scored as 0 = less than ¥10,000, 1 = ¥10,000–¥30,000, and 2 = more than ¥30,000.

#### 4.2.4 Statistical Analyses

This study attempted to assess current quality of life, discrimination experience, and social support among marriage-squeezed men by using comparative analysis methods, including one-way ANOVA, cross-tabulation tables and Pearson’s chi-square tests, and independent sample t-tests.

A series of linear regression models were created in a hierarchical manner to examine the independent contribution of discrimination and social support to the quality of life of marriage-squeezed men, and to identify whether social support can serve as a buffer for the relationship between discrimination and quality of life. There were four steps in developing the models. (1) Model 1 contained only control variables, including perceived marriage squeeze, age, marital status, education level, and annual income; (2) Model 2 added discrimination; (3) The four linear regression models in Models 3A and 3B separately incorporated network composition diversity, composition, total perceived support, and perceived support from three sources; (4) The four models in Models 4A and 4B added the interaction terms of discrimination and social support variables. Cohen and Hoberman (1983) claimed that the buffering hypothesis can be judged by observing the significance of the interaction term coefficient. In the regression analysis, network composition diversity and functional support variables were mean-centered because they are continuous variables. The statistical analyses were performed using Stata 14.

## 5 Results

### 5.1 Quality of Life, Discrimination, and Social Support for Marriage-Squeezed Men

Table 1 reports the differences in quality of life, discrimination experience, and social support between marriage-squeezed men and other male groups. The results showed that the mean score of quality of life among men who perceived marriage squeeze was much lower than that of men who did not. Meanwhile, unmarried men aged 28–49 and 50–65 years also had significantly lower scores than married men of the same age groups.

**Table 1** Quality of life, discrimination, and social support of marriage-squeezed men

	Perceived marriage squeeze				$\chi^2/t$ test	28–49		50–65		$\chi^2/F$ test				
	No		Yes			Married	Unmarried	Married	Unmarried					
	n	(%)	n	(%)										
Quality of life	93.14	(12.77)	85.02	(12.82)	9.39***	91.20	(12.01)	83.28	(14.05)	92.02	(11.79)	84.14	(12.38)	20.48***
<i>Discrimination</i>														
Yes, infrequently	311	(46.63%)	153	(49.84%)	29.32***	138	(49.11%)	75	(53.96%)	55	(49.11%)	31	(33.33%)	57.34***
Yes, often	15	(2.25%)	29	(9.45%)		8	(2.85%)	19	(13.67%)	4	(3.57%)	9	(9.68%)	
Network composition diversity	1.95	(1.19)	1.72	(1.20)	2.79***	1.86	(1.15)	1.66	(1.24)	2.01	(1.25)	1.55	(1.01)	5.35***
Family members	440	(65.38%)	165	(53.05%)	13.64***	183	(64.44%)	65	(44.52%)	80	(68.97%)	50	(53.76%)	27.45***
Relatives and neighbors	247	(36.70%)	131	(42.12%)	2.64	97	(34.15%)	57	(39.04%)	58	(50.00%)	43	(46.24%)	13.42*
Friends and others	458	(68.26%)	173	(55.63%)	14.76***	190	(66.90%)	86	(58.90%)	59	(50.86%)	35	(37.63%)	68.44***
Total perceived support	46.71	(6.94)	44.36	(8.11)	4.47***	46.56	(7.13)	43.36	(8.23)	46.73	(8.01)	44.65	(9.41)	5.40***
Family members	16.01	(2.62)	15.33	(3.03)	3.46**	15.90	(2.74)	14.89	(3.15)	15.89	(2.79)	14.99	(3.29)	6.16***
Relatives and neighbors	15.34	(2.60)	14.69	(2.85)	3.45**	15.40	(2.60)	14.40	(2.87)	15.63	(3.02)	15.05	(3.10)	3.72**
Friends	15.36	(2.49)	14.34	(3.17)	5.08***	15.27	(2.69)	14.08	(3.18)	15.21	(2.86)	14.60	(3.54)	5.49***

Data are presented as mean (SD) or n (%). The table omits data of married and unmarried men aged 20–27 to highlight the situation of marriage-squeezed men concisely. \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

Regarding discrimination, approximately 60% of men who perceived marriage squeeze reported that they had experienced discrimination, which was significantly higher than that of men who did not perceive marriage squeeze. In particular, nearly 10% of men who perceived marriage squeeze claimed that they often suffer from discrimination, which is more than four times the rate of men who did not perceive marriage squeeze. The proportion of unmarried men aged 28–49 years who reported having experienced discrimination reached 67.63%, which was significantly higher than the 51.96% of married men in this age group; moreover, the percentage of the former who reported often experiencing discrimination was approximately five times that of the latter. Meanwhile, the proportion of unmarried men aged 50–65 years who often experienced discrimination was also significantly higher than that of married men in the same age group.

For structural support, the network composition diversity of men who perceived marriage squeeze was significantly lower than that of men who did not perceive it. Compared with married men aged 28–49 and 50–65 years, the network composition diversity of unmarried men in these two age groups was significantly lower, particularly among unmarried men aged 50–65 years. As for member composition, both men who perceived a marriage squeeze and those who did not had higher proportions of family members and friends and others in their support network than relatives and neighbors. Similarly, married and unmarried men aged 28–49 years also had higher percentages of family members and friends. By contrast, among married and unmarried men aged 50–65 years, the proportion of family members and relatives and neighbors was much higher, while the proportion of friends and others was lower. For perceived support, regardless of total support or support from different sources, men who perceived marriage squeeze and unmarried men aged 28–49 and 50–65 years had moderately lower scores than those who did not perceive marriage squeeze and married men of the same age group.

## 5.2 The Relationship Between Discrimination and Quality of Life

Table 2 examines the effect of discrimination on quality of life of marriage-squeezed men. Model 1 showed that perceived marriage squeeze and age were significantly negatively correlated with quality of life. Compared with men who did not perceive marriage squeeze and who were aged 20–27 years, men who perceived marriage squeeze and who were aged 28–49 years scored significantly lower on quality of life. Meanwhile, both educational attainment and annual income were significantly positively associated with quality of life. The quality of life scores of men with high school education and above or who earned more than ¥10,000 were significantly higher than those with elementary school education and below or who earned less than ¥10,000. In Model 2, discrimination was significantly negatively related to quality of life, and its standardization coefficient was greater than that of marriage-squeeze variables. That is, the more frequently marriage-squeezed men reported experiencing discrimination, the lower their quality of life score. Moreover, compared with Model 1,  $R^2$  and Adj  $R^2$  in Model 2 increased significantly.

## 5.3 The Relationship Between Discrimination, Structural Support, and Quality of Life

Table 3 reports the direct and moderating effect of structural support on the quality of life of marriage-squeezed men who experienced discrimination. Model 3A showed that after adding network composition diversity and composition separately on the basis of Model

**Table 2** The impact of discrimination on quality of life for marriage-squeezed men

	Model 1	Model 2
Discrimination		-0.24*** (0.69)
<i>Perceived marriage squeeze (Ref. No)</i>		
Yes	-0.21*** (0.97)	-0.18*** (0.97)
<i>Age (Ref. 20–27)</i>		
28–49	-0.09* (1.00)	-0.07+ (0.99)
50–65	-0.02 (1.31)	-0.01 (1.30)
<i>Marital status (Ref. Married)</i>		
Never married	0.03 (0.98)	0.03 (0.96)
<i>Educational attainment (Ref. Primary school and below)</i>		
Junior high school	0.04 (1.23)	0.05 (1.23)
Senior high school and above	0.16** (1.28)	0.16** (1.27)
<i>Annual income (Ref. Less than ¥10,000)</i>		
¥10,000–30,000	0.09* (1.04)	0.07* (1.02)
More than ¥30,000	0.18*** (1.15)	0.18*** (1.14)
F	18.87***	24.36***
R <sup>2</sup>	0.13	0.19
Adj R <sup>2</sup>	0.13	0.18

The standardization coefficients and standard errors (in parentheses) are reported. \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , + $p < 0.10$

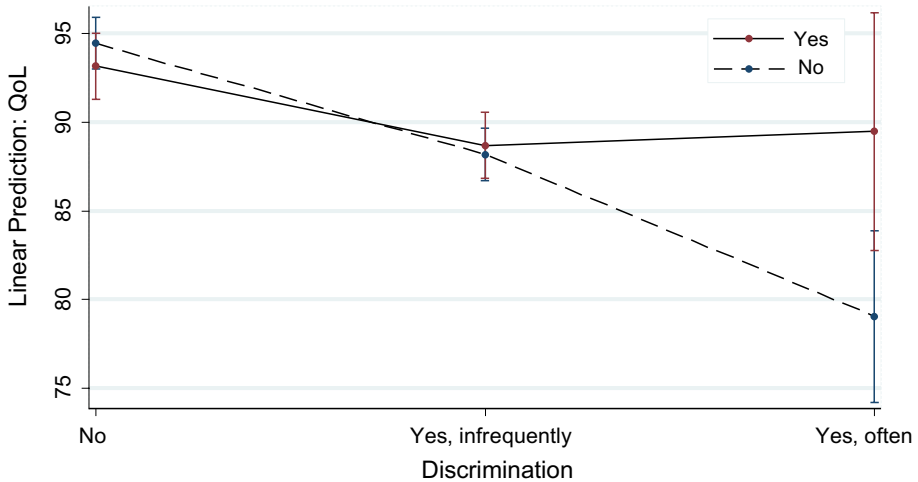
2, the regression coefficient and significance of discrimination did not change. Meanwhile, the main effects of network composition diversity and the three types of relationships on the quality of life of marriage-squeezed men were not significant.

After incorporating the interaction terms of discrimination and network composition diversity or composition, Model 4A showed that the interaction between discrimination and network composition diversity was not significant. However, significant interactions between discrimination and composition emerged for relatives and neighbors, and the coefficient was positive (standardized  $B = 0.11$ ,  $p < 0.05$ ). Figure 1 further illustrates the moderate effect of frequent interactions with relatives and neighbors on the relationship between discrimination and quality of life for marriage-squeezed men. The horizontal axis represents the frequency of discrimination, and the vertical axis represents the mean quality of life scores (predictive margin) for different combinations of different discrimination frequencies and whether the men often interact with relatives and neighbors. In Fig. 1, the solid line (frequent interaction with relatives and neighbors) intersects with the dashed line (infrequent interaction with relatives and neighbors), indicating the presence of an interaction effect. As discrimination frequency increases, the mean quality of life scores among men who often talk to relatives and friends change from lower to higher than the scores of men who do not often talk to relatives and friends, and the gap gradually increases. The calculation of the average marginal effect shows that among the male groups who reported frequently experiencing discrimination, the mean quality of life scores of men who often interact with relatives and friends are significantly higher than those of men who do not ( $p < 0.05$ ). That is, when marriage-squeezed men often suffer from discrimination, frequent interaction with relatives and neighbors can significantly buffer the negative impact of discrimination on their quality of life.

**Table 3** The relationship between discrimination, structural support, and quality of life for marriage-squeezed men

	Model 3A	Model 4A
Discrimination	-0.24*** (0.70)	-0.24*** (0.71)
Network composition diversity	0.04 (0.34)	0.02 (0.46)
Family members (Ref. No)		0.02 (1.21)
Relatives and neighbors (Ref. No)	0.02 (0.88)	-0.07 (1.19)
Friends and others (Ref. No)	0.02 (0.91)	0.02 (1.25)
Discrimination x Network composition diversity		0.03 (0.59)
Discrimination x Family members		0.004 (1.45)
Discrimination x Relatives and neighbors		0.11* (1.45)
Discrimination x Friends and others		0.002 (1.46)
Age (Ref. 20-27)		
28-49	-0.07* (1.01)	-0.07* (1.02)
50-65	-0.02 (1.32)	-0.02 (1.34)
Marital status (Ref. Married)		
Never married	0.02 (0.98)	0.02 (0.98)
Perceived marriage squeeze (Ref. No)		
Yes	-0.18*** (0.99)	-0.18*** (0.99)
Educational attainment (Ref. Primary school and below)		
Junior high school	0.04 (1.26)	0.04 (1.26)
Senior high school and above	0.14** (1.31)	0.14** (1.31)
Annual income (Ref. Less than ¥10,000)		
¥10,000-30,000	0.06+(1.04)	0.06+(1.04)
More than ¥30,000	0.17*** (1.16)	0.17*** (1.16)
F	21.76***	19.82***
R <sup>2</sup>	0.19	0.19
Adj R <sup>2</sup>	0.18	0.18

The standardization coefficients and standard errors (in parentheses) are reported. \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , +  $p < 0.10$



**Fig. 1** Interaction of discrimination and frequent interaction with relatives and neighbors in predicting quality of life of marriage-squeezed men

#### 5.4 The Relationship Between Discrimination, Functional Support, and Quality of Life

Table 4 reports the direct and moderating effect of functional support on the quality of life of marriage-squeezed men in the face of discrimination. Model 3B showed that after separately involving total perceived support and perceived support from three sources based on Model 2, the regression coefficient of discrimination decreased slightly, but the significance remained unchanged. Meanwhile, total perceived support was significantly positively associated with quality of life. Specifically, perceived support from family members and relatives and neighbors has a significant direct effect on quality of life. That is, when marriage-squeezed men perceived more available social support, particularly from family members and relatives and neighbors, their quality of life scores were higher.

After involving the interaction terms of discrimination and functional support variables, Model 4B showed that neither the total perceived support nor the three different sources of support had a significant moderating effect on the relationship between discrimination and quality of life.

## 6 Discussion

Using data collected from marriage-squeezed men in Anhui Province in central China, this study revealed the serious threat of discrimination to the men's quality of life, and explored which types and sources of support could mitigate the negative effects of discrimination. Table 1 suggests the mean quality of life scores of marriage-squeezed men are significantly lower than those of other male groups. The regression analysis results from Tables 2 - 4 further confirm that perceived marriage squeeze is negatively associated with quality of life. While existing studies have already explained this finding in detail (Wang et al., 2018; Yang et al., 2017), one notable finding has not yet been reported. After controlling for socio-economic factors, discrimination, and social support variables, the quality of life scores

**Table 4** The relationship between discrimination, functional support, and quality of life for marriage-squeezed men

	Model 3B		Model 4B	
Discrimination	-0.20*** (0.68)	-0.20*** (0.68)	-0.20*** (0.68)	-0.20*** (0.69)
Total perceived support	0.23*** (0.06)		0.24*** (0.07)	
Family members		0.08+ (0.22)		0.09 (0.30)
Relatives and neighbors		0.14** (0.24)		0.10 (0.35)
Friends		0.04 (0.21)		0.08 (0.32)
Discrimination x Total perceived support			-0.02 (0.08)	
Discrimination x Family members				-0.02 (0.35)
Discrimination x Relatives and neighbors				0.04 (0.40)
Discrimination x Friends				-0.05 (0.33)
<i>Age (Ref. 20–27)</i>				
28–49	-0.08* (0.97)	-0.08* (0.97)	-0.08* (0.97)	-0.09* (0.98)
50–65	-0.02 (1.26)	-0.03 (1.28)	-0.02 (1.27)	-0.03 (1.29)
<i>Marital status (Ref. Married)</i>				
Never married	0.03 (0.94)	0.03 (0.94)	0.03 (0.94)	0.03 (0.94)
<i>Perceived marriage squeeze (Ref. No)</i>				
Yes	-0.16*** (0.94)	-0.17*** (0.95)	-0.16*** (0.94)	-0.17*** (0.95)
<i>Educational attainment (Ref. Primary school and below)</i>				
Junior high school	0.03 (1.20)	0.02 (1.20)	0.02 (1.20)	0.02 (1.21)
Senior high school and above	0.11* (1.25)	0.11* (1.25)	0.11* (1.25)	0.11* (1.25)
<i>Annual income (Ref. Less than ¥10,000)</i>				
¥10,000–30,000	0.06+ (0.99)	0.06+ (0.99)	0.06+ (0.99)	0.07+ (1.00)
More than ¥30,000	0.17*** (1.11)	0.17*** (1.11)	0.17*** (1.11)	0.17*** (1.11)
F	29.29***	24.55***	26.62***	19.66***
R <sup>2</sup>	0.24	0.24	0.24	0.24
Adj R <sup>2</sup>	0.23	0.23	0.23	0.23

The standardization coefficients and standard errors (in parentheses) are reported. \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , + $p < 0.10$

for men aged 28–49 years were found to be significantly lower than those for men aged 20–27 and 50–65 years. The explanation may be that middle-aged unmarried men suffer more pressure from family and society. These findings indicate that policymakers and village managers should regard middle-aged unmarried men and men who perceive marriage squeeze as a key protection group in the rural social security system. Meanwhile, it is also necessary to provide targeted physical and mental health services to improve their health. These men are often ignored because of their relatively young age.

As expected, discrimination is a powerful predictor of poor quality of life among marriage-squeezed men. Specifically, Table 1 suggests that the proportion of marriage-squeezed men who reported that they often suffer from discrimination is significantly higher than for other male groups. In particular, the proportion of unmarried men aged 28–49 years who often experienced discrimination is much higher. Meanwhile, the results from Tables 2 - 4 suggest that discrimination has a significant negative effect on

quality of life, and this negative effect remains almost unchanged after adding the structural and functional support variables. Combining similar findings in Shaanxi Province in western China (Attané & Yang, 2018), it can be concluded that discrimination is a significant stressor that contributes to poor quality of life for marriage-squeezed men.

Table 1 shows that the levels of network composition diversity and perceived support among marriage-squeezed men are significantly lower than for other male groups, which is consistent with previous studies (Li & Li, 2011). As age increases, the composition diversity of unmarried men gradually decreases. Their social circle shrinks and may be limited to local and kin relationships. They become more dependent on family members, such as siblings, nephews, etc., and may interact frequently with cousins, distant relatives in the same village, and familiar neighbors and villagers. The frequency of communication with friends who live far away decreases. The results in Tables 3 and 4 further demonstrate the importance of relatives and neighbors in the support network for marriage-squeezed males. Table 3 suggests that network diversity and composition have no significant main impact on quality of life, which is not in line with expectations. The reason may be related to the measurement of data and Chinese culture (Shavitt et al., 2016; Taylor et al., 2007). We asked who the interviewees often talk to when they are in a bad mood. However, in the context of Chinese culture, especially in rural areas, cultural norms emphasize that men should control and suppress their emotions. Confiding in others about stressful life events may be regarded as a norm violation which can sometimes even create psychological stress for marriage-squeezed men (Shavitt et al., 2016). A study on rural forced bachelors in China also found that the emotional comfort provided by non-kin ties was not associated with the bachelors' life satisfaction (Li & Li, 2011). In contrast, functional support has a main effect on quality of life (see Table 4). Among the three different sources, perceived support from relatives and neighbors has the strongest positive effect, followed by support from family members. These results are consistent with the prediction. Reporting a high level of perceived support implies that marriage-squeezed men have more positive psychosocial characteristics, which can improve their quality of life through various mechanisms (Uchino, 2009). Meanwhile, perceiving more support by relatives and neighbors also means the men have a good relationship with the people around them, which can lead to feeling loved, cared for, supported, and less lonely (e.g., Chou, 2012; Stokes, 2020).

Moreover, although the moderating effect of network composition diversity is not significant, interaction with relatives and neighbors can alleviate the damaging effect of discrimination on quality of life. However, there was no significant interaction between discrimination and total perceived support or support from three distinct sources. One explanation for these findings may be related to Chinese culture, which may also explain the inconsistency with many Western studies on discrimination and social support (e.g., Chou, 2012; Itzick et al., 2018; Marshall & Rue, 2012; Trujillo et al., 2017). In Asian collectivist culture, helping others or receiving help means that people must fulfill responsibilities and obligations. These people may be unwilling to seek frequent social support because of the obligation to reciprocate in the future (Mojaverian & Kim, 2013). In contrast, Europeans and Americans are oriented toward expressing opinions and beliefs and achieving personal goals (Kitayama et al., 2004). They are free to create social relationships and have few obligations toward these relationships (Adams & Plaut, 2003). Research has confirmed that the stress-buffering effect of social support varies across cultures. In contrast to Europeans and Americans, Asians benefit less, both physically and psychologically, from social support and report lower use of social support to deal with stressful situations (Shavitt et al., 2016; Taylor et al., 2007). Therefore, one possible reason for the small buffering effect of



social support for marriage-squeezed men is that they are concerned about potential negative relational implications when seeking social support.

The finding that frequent interactions with relatives and neighbors can reduce the damaging effects of discrimination may be because confiding in someone does not involve a material exchange, so marriage-squeezed men are not concerned about obligations and indebtedness. Additionally, the establishment of positive and supportive social relationships outside the family also means that marriage-squeezed men experience a good social environment and a high degree of social integration. Positive relationships with relatives and neighbors can be protective because they reduce the possibility of experiencing discrimination. They also potentially mitigate the harmful effects of discrimination on quality of life by making individuals feel safe and secure within their physical community, reducing the erosion of stressful interactions on individuals' sense of worth and belonging, reducing adverse psychological and physiological responses, and improving their perspectives on the future (Seawell et al., 2014; Stokes, 2020). In contrast, family members, friends, and others may be unable to play a protective role because they are a source of discrimination. Frustration with a family member who has failed to marry may increase pressure on marriage-squeezed men. The men may also take family member interactions and support for granted, and thus, rarely receive psychological compensation and comfort. Moreover, they may be reluctant to share shameful experiences with friends, and even more so with acquaintances. The comfort provided by friends and acquaintances may increase the sense of inferiority and stigma.

Meanwhile, another reason why perceived support had no buffering effect may be because it is actually a psychological resource. Discrimination as a form of psychological aggression can evoke men's sense of shame, attack their self-concept and sense of self-worth, and reduce their confidence in receiving support from social network members. Consequently, psychological support is not enough to offset the negative impact of discrimination on the quality of life of marriage-squeezed men. Some studies on discrimination against other populations found similar results (e.g., Ajrouch et al., 2010; Prelow et al., 2006; Su et al., 2013).

## 7 Conclusion and Limitations

The present study found that, first, marriage-squeezed men are at a disadvantage regarding social contexts and personal social resources. Young and middle-aged men have poorer quality of life and experience more discrimination. Meanwhile, the structural and functional support for marriage-squeezed men is worse than for other groups of males. Second, discrimination is a powerful stressor that negatively affects the quality of life of marriage-squeezed men. This negative consequence is difficult to eliminate, and the buffering effect of social support is limited. Meanwhile, when marriage-squeezed men experience discrimination, structural support and functional support have different functions that are contrary to prevalent theoretical assumptions (Cohen, 2004; Helgeson, 2003). Specifically, structural support has no significant direct impact on quality of life, while interaction with relatives and neighbors can mitigate the negative consequences of frequent discrimination. Functional support, particularly from family members, relatives, and neighbors, has a significant positive main effect on the quality of life of marriage-squeezed men; however, there is no buffering effect on the relationship between discrimination and quality of life. These findings show that, for young and middle-aged

marriage-squeezed men, developing active and supportive social relationships outside the home and promoting communication and contact with villagers can increase the ability to cope with discrimination. Moreover, future research needs to investigate other protective resources to address discrimination and maintain the health and wellbeing of marriage-squeezed men.

There are some limitations. First, some internal relationships between discrimination, social support, and quality of life were not analyzed. For instance, experiences of discrimination and poor quality of life may hinder the establishment and maintenance of social support networks, which in turn can lead to repeated discrimination and a worse quality of life. Additionally, a causal relationship between structural support and functional support may also exist in the influence process (Harasemiw et al., 2019). Second, the conceptualization and measurement of discrimination has multiple flaws. The measurement did not specify whether marriage-squeezed men experienced discrimination because they had remained single after a certain age, and did not differentiate the place of occurrence and the source of discrimination. Research on discrimination during adolescence has found that the effects of discrimination on mental health outcomes vary based on source (Benner & Graham, 2013). Third, due to data limitations, this study only explored the buffering hypothesis of general support and did not reveal the effect of tailored support that would better match the needs of men who experience discrimination. In the future, long-term tracking data can be used to further examine the causal relationship between discrimination, social support, and quality of life. Meanwhile, the discrimination variable should be measured in greater detail. Researchers can also examine whether tailored resources for discrimination weakens its association with quality of life, thereby helping policymakers formulate more targeted interventions to reduce the damaging influence of discrimination on marriage-squeezed men.

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#### **Declarations**

**Conflicts of interest** The author declares that they have no conflict of interest.

**Ethics approval** The Academic Committee of the School of Public Policy and Administration at Xi'an Jiaotong University approved all data collection procedures.

**Consent to participate** All the interviewees signed an informed consent form and agreed to participate in the investigation.

**Consent for publication** All authors approved the manuscript and agreed to publish it.

**Code availability** Not applicable. All data were calculated using Stata 14 installed in the computer in the Lab of the School of Public Policy and Administration of Xi'an Jiaotong University.

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