

Factors associated with depression of the parents who lost their only child in western China city

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Research article

Keywords: GDS; who lost their only child; mental health; social support; long term care

Posted Date: August 13th, 2019

DOI: <https://doi.org/10.21203/rs.2.12757/v1>

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Abstract

Background: The number of families who lost their only child is estimated to be 10 million by 2035. The parents who lost their only child are forced to endure psychological suffering and cope with elderly care problems alone. Long-term poor mental health can affect physical health and reduces the quality of life and well-being. Methods: Participants were selected using the method of combining stratified sampling with cluster sampling. The study used GDS and adopted a generalized linear regression model to investigate the parents who lost their only child in Anshun city, Guizhou province, China, to comprehensively and systematically explore the depression status and its influencing factors of the parents. Results: The parents who lost their only child of different self-assessment of health status ($P=0.004$) and the number of chronic diseases ($P=0.001$) had different GDS scores. EQ-5D score($P=0.019$) and SSRS score($P<0.001$) were significantly associated with the depression of the parents who lost their only child. Conclusion: The parents who lost their only child is a high-risk group of depression, and targeted interventions should be carried out for them. The family doctor team should increase the frequency and content of serving them, and promptly manage their health. A diverse social support system should be built and consolidated for these parents.

Background

The one-child policy has been performed for more than 30 years in China, which provided that only one child is allowed in each family. Although the policy had succeeded in controlling the rapid growth of the population, it brought new problems and challenges for the Chinese government and citizens. The emergence of the families who lost their only child is a social problem that cannot be ignored. According to the national health commission in China, the number of families who lost their only child has risen to more than 1 million by 2011. and this number is estimated to be 10 million by 2035^[1]. Traditionally, children provide not only a continuation of the bloodline but also emotional sustenance for parents in China. The old mottos of “carrying on the family line” and “bringing up sons to support parents in old age” have been preserved by Chinese parents from generation to generation. The parents who lost their only child are forced to endure psychological suffering and cope with elderly care problems alone^[2].

Long-term poor mental health can affect physical health and reduces the quality of life and well-being. Therefore, people with psychological problems should be given timely attention and effective intervention. Depression is one of the common mental diseases among the elderly. The World Health Organization (WHO) has predicted that depression will become the third leading cause of disability worldwide by 2020. Depression is associated with a lower quality of life and an increased risk of mortality^[3]. Geriatric Depression Scale(GDS) was widely used to evaluate depression status. It is necessary to understand the depression status of the parents and its influencing factors, to facilitate the exploration of effective, personalized interventions.

Xiaofu Pan (2016) studied bereaved parents in Chongqing, China, and found that child's age at death, time since the death, and cause of death, parent's education and health, and community support are

associated with the degree of posttraumatic growth^[4]. Qianlan Yin (2018) found that Shidu (loss-of-only-child family) parents have more severe mental health problems than parents who have a living child^[5]. Wen Zhang (2016) found that targeted intervention should be developed and timely attention must be paid to the mental health of the bereaved parents who are without a spouse and have low income^[6]. Lingyu Ran used symptom check list-90 (SCL - 90) and other scales and found that the mental health level of the Shidu parents decreased significantly, and positive coping has a positive effect on the mental health of the parents^[7].

The existing studies have the following defects: First, there are more qualitative studies and fewer quantitative studies on large samples. Second, no studies using GDS to measure the depression status of the parents who lost their only child have been seen. Third, the independent variables considered were not comprehensive enough, for example, the third generation, social support status, and quality of life were rarely mentioned. Therefore, in order to provide evidence for designing an appropriate depression intervention program for the parents who lost their only child, and to improve their depression. This study used GDS and adopted a generalized linear regression model to investigate the parents who lost their only child in Anshun city, Guizhou province, China, to comprehensively and systematically explore the depression status and its influencing factors of the parents.

Methods

2.1 Sampling

Data were collected from March to April 2018 in Anshun city, Guizhou province, China, which located in western China, and its economy is underdeveloped. Participants were selected using the method of combining stratified sampling with cluster sampling. The sampling process involved a systematic approach and a four-step scheme: (a) According to the address location, the four districts of Anshun were divided into two levels: east and west. (b) A district was selected from each level, and they were Xixiu and Kaifa, respectively. (c) According to the method of cluster sampling, selected a number of communities with more parents who lost their only child for the whole survey from each district. (d) To survey the parents in these communities. The inclusion criteria were: a) Being older than 49 (In view of the fact that the health bureau has included parents who lost their only child aged at least 49 into the systematic management, and the mothers who lost their only child aged at least 49 were no longer in the fertile period), b) Having normal cognitive functions, willing and able to cooperate throughout the investigation process. The exclusion criteria were: a) The parents who lost their only child had refused to accept the government's condolence and investigation, b) Moving to another place.

One teacher from Zhejiang Chinese Medical University and 15 family planning cadres in local communities were recruited and trained as interviewers. All respondents were clearly informed of the purposes of this study and asked to sign in the consent form. All respondents were assured of their right to refuse to participate or to withdraw from this study at any time. Anonymity and confidentiality of the

participants were assured. Each interview lasted for about 30 min. 130 participants were interviewed. There were 108 valid questionnaires, and the effective recovery rate was 83.1%.

2.2. Measurements

2.2.1. GDS

Geriatric Depression Scale(GDS) was developed by the U.S. Brink and Yesavage in 1982 which has 30 items in total. The simplified geriatric depression scale (GDS-15) is a 15-item simplified scale designed by Sheikh and Yesavage in 1986 and is based on the standard version of 30 items according to the characteristics of the older people^[8]. It was used to evaluate the depression status of the respondents in the recent week, mainly testing the old people's feeling down, reduced activity, irritability, pain, withdrawal, and other thoughts, and negative evaluation of the past, present and future. A higher score on the scale indicates more severe depression^[8]. A simplified scale was used in this study. The GDS scores of the parents who lost their only child were regarded as the dependent variable.

2.2.2. EQ-5D scale

European quality of life-5 dimensions(EQ-5D) scale mainly includes five dimensions: mobility, self-care, daily activities, pain or discomfort, anxiety or depression. Each dimension has three levels of "no difficulty", "some difficulty" and "total difficulty", which are used to evaluate the quality of life of the respondents. Due to the lack of calculation method of China's EQ-5D index score at present, we chose to use the integral conversion table of Japan for calculation, which is also located in the east of Asia like China, and the scale index score is -0.11~1.00 points. A higher EQ-5D score indicates better health^[9].

2.2.3. SSRS

Social Support Rate Scale(SSRS) has 10 items in total, which is divided into three dimensions: subjective support, objective support, and utilization of support. The sum of the scores of the three dimensions is the total score of the scale. A higher score indicates a higher level of social support. A total score of less than 20 indicates less social support, a total score of 20-30 indicates general social support, and a total score of more than 30 indicates satisfactory social support^[10].

2.2.4. Independent variables

The independent variables included: gender(1=male, 2=female, reference value), educational level (1=junior high school and below, 2=senior high school, 3= college and above, reference value), marital status(1=in marriage, 2=not in marriage, reference value), the third generation(1=have, 2=no, reference value), and self-assessment of health status(1=good, 2=moderate, 3=bad). There were some continuous variables, including age, monthly income, number of chronic diseases, EQ-5D score, SSRS score.

The number of chronic diseases was measured by the multiple-choice question, "How many chronic diseases do you have?" Sixteen chronic diseases were listed for selection, including diabetes,

hypertension, hyperlipidemia, the malignant tumor, Cerebral infarction (stroke), cerebrovascular disease, coronary heart disease, senile dementia, chronic liver disease, gout, asthma, gynaecology disease, arthritis, tuberculosis (TB), hematopathy, chronic low back pain, osteoporosis, cataract. a higher score meant that participants had more chronic diseases. However, self-assessment of health status was regarded as continuous variables in the generalized linear regression model.

2.3. Quality control

The respondents' ages were confirmed using the household registration system. During the face-to-face field survey, the trained teachers and family planning cadres in local communities explained how to fill in the questionnaires and helped respondents complete them in their homes or community residents committee office. The database was established by EpiData3.1, and double input was conducted to ensure accuracy.

2.4. Data analysis

Data were analyzed using the SAS version 9.1 software. Participant sociodemographic variables were expressed as frequencies. In view of the non-normal distribution of GDS score data, the rank sum test was used to compare the GDS score of the parents who lost their only child with different basic characteristics. The generalized linear univariate and multivariate regression models were conducted to analyze factors influencing GDS score.

Results

3.1. Sociodemographic characteristics and basic situation of GDS score

The average age of these parents in this survey was 62.84 years old, the standard deviation was 5.66, the median and quartile were 62.42 and 7, the minimum and maximum values were 52 and 83 respectively. Their average monthly income was 2392.97 yuan, the standard deviation was 1317.81 yuan, the median and quartile were 2452.50 yuan and 1725 yuan, the minimum, and maximum values were 200 yuan and 6605 yuan respectively. Other sociodemographic characteristics were shown in Table 1. Their average GDS score was 5.64, the standard deviation was 3.71, the median and quartile were 4 and 5, the minimum and maximum values were 1 and 15 respectively.

3.2. Comparison of GDS score

Table 1 presents the GDS score comparison of the parents who lost their only child with different basic characteristics. Rank sum test results were shown: The parents who lost their only child of different self-assessment of health status ($P=0.004$) and the number of chronic diseases ($P=0.001$) had different GDS scores. The parents who assessed themselves as in good health were less depressed than those who assessed themselves as in moderate and poor health. The parents who don't have chronic disease are less depressed than parents who do. The parents who suffer from one chronic disease are less depressed than the parents who suffer from two or more diseases.

3.3. Results of generalized linear univariate regression analysis

Table 2 presents the results of generalized linear univariate regression analysis of the factors affecting the depression of the parents who lost their only child. Self-assessment of health status($P=0.002$), number of chronic diseases($P=0.002$), EQ-5D score($P<0.001$) and SSRS score($P<0.001$) were significantly associated with the depression of the parents who lost their only child. The worse the self-assessment of health status, the more kinds of chronic diseases the parents had, the more serious the depression of the parents who lost their only child. The lower the EQ-5D score, the lower the SSRS score, and the more serious their depression.

3.4. Results of generalized linear multivariate regression analysis

Table 3 presents the results of generalized linear multivariate regression analysis of the factors affecting the depression of the parents who lost their only child. EQ-5D score($P=0.019$) and SSRS score($P<0.001$) were significantly associated with the depression of the parents who lost their only child. The lower the EQ-5D score, the lower the SSRS score, and the more serious their depression.

Discussion

The purpose of this study was to clarify the depression status of the parents who lost their only child and its influencing factors in Anshun city, Guizhou province, China, and provide strategies to alleviate their depression. This study adopted a generalized linear regression model and found the following results: The parents who lost their only child of different self-assessment of health status ($P=0.004$) and the number of chronic diseases ($P=0.001$) had different GDS score. EQ-5D score($P=0.019$) and SSRS score($P<0.001$) were significantly associated with the depression of the parents who lost their only child. Their average GDS score was 5.64, the standard deviation was 3.71. The standard cutoff score is 5^[11]. Therefore, the average GDS score of these parents exceeds the standard cutoff score. This study is consistent with David J. Vinkers ' findings. He found that all respondents reported the bereavement to be a major negative life event. A negative life event was the most important risk factor for depression in the elderly^[12]. Heidi Sivertsen also found that bereavement is a risk factor for depression^[3]. Therefore, the parents who lost their only child is a high-risk group of depression, and targeted interventions should be carried out for them.

The results of this study showed that the parents who assessed themselves as in good health were less depressed than those who assessed themselves as in moderate and poor health. The parents who don't have chronic disease are less depressed than parents who do. The parents who suffer from one chronic disease are less depressed than the parents who suffer from two or more diseases. The lower the EQ-5D score, the more serious their depression. There is no study on this aspect of the parents who lost their only child, Heidi Sivertsen studied the ordinary elderly. This study is consistent with Heidi Sivertsen 's findings. He also found that physical morbidity and impaired level of functioning were associated with depression^[3]. Alice Laudisio pointed out that depressive symptoms were associated with reduced QoI^[13].

This may be because the physical illness affects mental health and therefore increases the risk of depression. Therefore, it is very important to maintain and manage the health of these parents. At present, the family doctor contract service system is vigorously promoted throughout China. These parents should be the key contracting service objects for family doctors. The family doctor team should increase the frequency and content of serving them, and promptly provide them with preventive and primary health care services. If they encounter diseases that cannot be solved, promptly help to refer to the higher level hospital.

This study found that the lower the SSRS score, and the more serious their depression. The results of this study were similar to those of Harry Owen Taylor. He found that subjective social isolation and from friends only and from both family and friends was associated with more depressive symptoms^[14]. Everyone in society needs the care and help of others. These parents lacked an important source of social support after losing their only one child. Therefore, other social support resources will be very needed and important. For instance, relatives, friends, social workers, government, society, etc. A diverse social support system should be built and consolidated for these parents. Heidi Sivertsen found that female gender and older age were associated with depression^[3]. DEREK RICHARDS found that women are a high-risk group of depression^[15]. But we did not find it. Maybe due to the particularity of the parents who lost their only child. Women are more likely to talk after being bereavement, which may reduce the probability of depression. Men are more likely to hide their sadness in their minds and increase the probability of depression. We did not find that age is an influencing factor, probably because of the small sample size. This study has several strengths. First, a quantitative study on the depression status of the parents who lost their only child by using GDS was carried out. Second, for the first time, we conducted quantitative research in this area for the western cities where China's economy is underdeveloped. Third, the independent variables of the factors influencing depression were relatively comprehensive. Some limitations of the study should be acknowledged. First, some of these parents who had been studied had not yet entered the old age, but they also had been assessed by adopting the age-specific GDS. Second, only one city in western China was surveyed, and the sample size was small. Third, this study was a cross-sectional study and it is difficult to make a causal inference. This study systematically analyzed the depression status of these parents and its influencing factors, and provide a theoretical basis for relieving the depression of this special vulnerable group. China is working hard to improve people's livelihood. Relieving the depression of this group is one of the important issues that the government and the community need to pay attention to. This study can further arouse the attention and concern of all circles in this society. There are some topics worth further study in the future. First, we need to further increase the sample size of western China's cities or expand the nationwide survey to further pinpoint the various influencing factors of the vulnerable groups' depression. Second, some other independent variables could be added, such as the time of death of the child, age. Third, design more detailed interventions to alleviate their depression.

Conclusions

The parents who lost their only child is a high-risk group of depression, and targeted interventions should be carried out for them. The family doctor team should increase the frequency and content of serving them, and promptly manage their health. A diverse social support system should be built and consolidated for these parents. This study has certain reference value for relieving parents' depression symptoms.

Abbreviations

WHO: World Health Organization; GDS: Geriatric Depression Scale EQ-5D: European quality of life-5 dimensions; SSRS: Social Support Rate Scale; TB: Tuberculosis; Qol: Quality of life

Declarations

a. Ethics approval and consent to participate

Dr. Rong Chao presided over the following three research projects: The National Social Science Youth Project of China (Number: 16CSH071), The China Ministry of Education's Humanities and Social Sciences Research Youth Program (Number: 15YJC840024), and China NHC Key Laboratory of Health Economics and Policy Research Program (Number: NHC-HEPR2018004). Dr. Rong's research team needs to conduct a questionnaire survey on the sociodemographic characteristics, social support, mental health, quality of life, diseases and service utilization, and elderly care preference of the parents who lost their only child in China. According to The Medical Ethics Committee of Zhejiang Chinese Medical University, since these studies do not involve human intervention, do not pose a health risk to the human body. And the research team promised to keep all the investigation materials confidential and never leak. The committee has decided that a full review is not necessary, and decided to grant ethical approval waiver.

The written Informed consent was obtained from all individual participants included in the study.

b. Consent for publication

All authors have approved the final manuscript and consent for publication

c. Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available due China's parents who lost their only child are a special vulnerable group, giving them some privacy protection. But are available from the corresponding author on reasonable request.

d. Competing interests

The authors declare that they have no conflict of interest. The funding sources had no role in the design of this study and will not have any role during its execution, analyses, interpretation of the data, or decision to submit results.

e. Funding

The National Social Science Youth Project of China Number: 16CSH071.

f. Authors' contributions

Wei-Jun Zheng and Tian-Li Liu designed the present study. Shu-Hua Shen and Hong Fan assisted in the acquisition of subjects and data. Analysis and interpretation of data were conducted by Wei-Wei Shen. The preparation of the manuscript was conducted by Chao Rong and Hui-Ling Yuan. All authors contributed to and have approved the final manuscript.

g. Acknowledgements

We are grateful to China scholarship council.

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Tables

Table 1 The GDS score comparison of parents who lost their only child with different sociodemographic characteristics $\|M (Q_R)\|$ score $\|$

Characteristic	Frequency	GDS	Z	P
Gender			-1.040	0.298
Male	48	4.0(6.0)		
Female	60	5.0(5.0)		
Age			-1.276	0.202
≤60	38	3.5(6.0)		
>60	70	5.0(5.0)		
Educational level			0.661	0.719
Junior high school and below	91	4.0(5.0)		
Senior high school	12	4.0(8.0)		
College and above	4	3.5(7.0)		
marital status			-1.797	0.072
In marriage	80	4.0(4.0)		
not in marriage	28	6.0(8.0)		
monthly income [yuan]			-1.399	0.162
≤2400	53	5.0(6.0)		
>2400	55	4.0(4.0)		
The third generation			-0.041	0.967
Have	44	4.0(4.0)		
No	64	4.0(7.0)		
Self-assessment of health status			11.037	0.004
Good	44	3.0(4.0)		
Moderate	48	7.0(7.0)		
Poor	16	4.5(7.0)		
Number of chronic diseases			16.659	0.001
0	29	3.0(2.0)		
1	28	7.0(4.0)		
2	28	5.0(8.0)		
≥3	23	5.0(5.0)		

Table 2 Generalized linear univariate regression analysis model of the factors affecting the depression of the parents who lost their only child

Independent variables	Reference	$\beta \pm 95\% CI$	SE	P	OR	95%CI
Gender			0.874	0.439	0.661	
Male	Female	-0.625(-2.022,0.772)	0.713	0.380	0.535	(0.132,2.163)
Age		0.047(-0.076,0.170)	0.063	0.455	1.048	(0.926,1.186)
Educational level						
Junior high school and below	College and above	1.398 (-2.270,5.067)	1.872	0.455	4.049(0.103,158.699)	
Senior high school		1.333(-2.813,5.479)	2.115	0.528	3.794(0.060,239.701)	
Marital status						
In marriage	not in marriage	-1.404(-2.971,0.164)	0.800	0.079	0.246	(0.051,1.178)
Monthly income		0.000(-0.001,0.000)	0.000	0.587	1.000	(0.999,1.000)
The third generation						
Have	No	-0.541(-1.955,0.873)	0.721	0.453	0.582	(0.142,2.393)
Self-assessment of health status		1.015(0.360,1.669)	0.334	0.002	2.758	(1.433,5.308)
Number of chronic diseases		0.711(0.256,1.167)	0.233	0.002	2.037	(1.291,3.213)
EQ-5D score		-12.032(-17.257,-6.808)	2.666<0.0015.948		(3.202,0.001)	
SSRS score		-0.177±0.258±0.096	0.042<0.0010.838		(0.773,0.909)	

Table 3 Generalized linear multivariate regression analysis model of the factors affecting the depression of the parents who lost their only child

	$\beta \pm 95\% CI$	SE	P	OR	95%CI
Self-assessment of health status	0.645(-0.126,1.415)	2.791	0.101	1.906(0.882,4.117)	
Number of chronic diseases	0.138(-0.417,0.693)	0.283	0.627	1.148(0.659,1.999)	
EQ-5D score	-6.885(-12.644,-1.126)	2.939	0.019	0.001(3.226,0.324)	
SSRS score	-0.162(-0.239,-0.085)	0.039	<0.001	0.850(0.787,0.918)	