ORIGINAL RESEARCH ARTICLE

Out-of-pocket health expenditure, social protection, and life expectancy of female-headed households in China

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Abstract

This study explores the relationship between out-of-pocket health expenditure, social protection interventions, and life expectancy of female-headed households in China. The study was based on data extracted from the World Bank (2021) Global Financial Inclusion Index (Global Findex) and applied the descriptive statistics and the Ordinary Least Squares Regression (OLS). The results show that there is a significant positive coefficient for social protection in total households, females, and males, indicating a beneficial link between social protection programs and life expectancy in female-headed households in China. Conversely, negative coefficients for out-of-pocket health expenditure suggest that higher healthcare costs are associated with lower life expectancy, highlighting the financial strain on these households. These submissions justify the necessity for social protection interventions in improving health outcomes and addressing financial barriers to healthcare access for female-headed households in China. *(Afr J Reprod Health 2024; 28 [10]: 160-166).*

Keywords: health interventions; social protection programs; life expectancy; financial inclusion

Résumé

Cette étude explore la relation entre les dépenses de santé directes, les interventions de protection sociale et l'espérance de vie des ménages dirigés par une femme en Chine. L'étude était basée sur des données extraites de l'indice mondial d'inclusion financière de la Banque mondiale (2021) (Global Findex) et a appliqué les statistiques descriptives et la régression des moindres carrés ordinaires (OLS). Les résultats montrent qu'il existe un coefficient positif significatif pour la protection sociale dans l'ensemble des ménages, femmes et hommes, indiquant un lien bénéfique entre les programmes de protection sociale et l'espérance de vie des ménages dirigés par une femme en Chine. À l'inverse, les coefficients négatifs pour les dépenses de santé directes suggèrent que des coûts de santé plus élevés sont associés à une espérance de vie plus faible, ce qui met en évidence la pression financière exercée sur ces ménages. Ces arguments justifient la nécessité d'interventions en matière de protection sociale pour améliorer les résultats en matière de santé et éliminer les obstacles financiers à l'accès aux soins de santé pour les ménages dirigés par une femme en Chine. *(Afr J Reprod Health 2024; 28 [9]: 160-166).*

Mots-clés: interventions de santé, programmes de protection sociale, espérance de vie, inclusion financière

Introduction

Female-headed households across the globe, particularly, in developing countries, face unique challenges in accessing healthcare services and managing health-related expenses[1-3]. With the rising cost of healthcare and limited social protection interventions, these vulnerable populations often struggle to afford necessary medical care, which can have significant implications for their well-being and longevity[4]. Understanding the nexus between out-of-pocket health spending, social welfare programs, and life expectancy among female-headed households is crucial for informing programmes and interventions target at improving their health outcomes, which is the rationale for this study.

According to the World Health Organization (WHO), out-of-pocket health expenditure remains a major barrier to healthcare

access for many individuals, particularly those in low- and middle-income countries[5]. In China, where healthcare costs have been steadily increasing, female-headed households are particularly vulnerable to financial strain when seeking medical treatment. A study by Meng *et al*[6] found that female-headed households in under developed areas of China spent a bigger percentage of their income on healthcare compared to male-headed households, highlighting the disproportionate burden faced by women in accessing healthcare services.

In addition to out-of-pocket health expenditure, social protection interventions play a crucial role in supporting vulnerable populations and improving health outcomes[7,8]. Social welfare programs such as health insurance schemes and targeted subsidies can help alleviate the financial burden of healthcare costs and ensure that female-headed households have access to essential medical services. Research by Li *et al.*[9] suggests that social protection interventions can have a positive impact on the health and well-being of female-headed households in China, leading to improved life expectancy and quality of life.

By examining the interplay between out-of-pocket health expenditure, social protection interventions, and life expectancy among female-headed households in China, this study shed lights on the challenges faced by these vulnerable populations and identify potential strategies for addressing them.

The findings of this research could bring about policy documents and interventions targeted at improving healthcare access and quality of life for women-led families in China. This study expands the frontiers of knowledge by focusing on the specific objectives which are, to examine the i) effect of out-of-pocket health expenditure on life expectancy of households in China, ii) influence of social protection intervention on life expectancy in China
iii) differential impact of social protection and out-of-pocket health expect on life expectancy across male and female headed households heads in China.

Methods

Data and estimation techniques

The primary data source utilized in this research is the Global Financial Inclusion Index (Global Findex) 2021 by the World Bank[10]. The Global Findex Database is a comprehensive collection of data that offers detailed information on individual financial behaviours related to saving, borrowing, payment methods, and risk management.

This database by the World Bank provides valuable insights into the ways in which individuals access and utilize financial services, such as bank accounts, digital payments, and credit. The dataset was compiled by the World Bank through interviews conducted with over 150,000 adults across more than 140 countries. Table 1 outlines the definitions of the variables and the methods used for their measurement. As the dependent variable (life expectancy, measured by the age of the respondents in years) is continuous, this study employs ordinary least squares regression analysis to examine the data.

$$Y = \alpha + \psi X'_i + \gamma Z'_i + e_i$$

$$(1)$$

Where Y_i is the dependent variable (life expectancy (in years) of ith household); X' is a vector of the dependent variables - out-of-pocket expenditure measured by Yes coded as 1 if the respondent saves or borrow mainly for, medical reasons, No (0) otherwise. Similarly, social protection was measured by a dummy – Yes – coded as 1, if the respondent has received government intervention transfers such as in-kind or in-cash support, and No codded as 0 otherwise. By simple definition, social protection interventions as relate to health play a pertinent role in making sure ensuring equitable accessibility to healthcare services, ameliorating health disparities, and enhancing better health status for vulnerable individuals. This could be in form of health insurance schemes, cash transfers for health, maternal and child health programs, disability benefits and community-based health initiatives[11].

Z' captures the covariates of control variables such as financial literacy (if the household save for old age, Yes =1, No =0), income quintile of the household (Yes (1) if the household falls within the fourth 20% and richest 20% income level and No (0) if the household falls within the Poorest 20%) and financial inclusion measured by three variables – if the respondent made use of mobile phone to pay for a purchase in-store; if respondent made bill payments online via the Internet and if send money to a family member or friend online using the internet, Yes =1 and 0 otherwise). e_i is an error term and it is presumed to be independent and identically distributed [(i.i.d.) $\sim$ 0, σ^2] across observations.

We utilized the Ordinary Least Squares (OLS) regression which is a statistical approach used in estimating the relationship between one or more explanatory variables and a dependent variable. In OLS regression, the purpose is to identify the line (or plane in multiple dimensions) that minimizes the sum of the squared differences between the observed values and the values predicted by the regression model. The OLS method assumes that the relationship between the variables is linear and that the errors in the model are in a normal distribution. By fitting a line through the data points, OLS regression allows researchers to measure the power and direction of the relationship between variables, as well as make predictions based on the model. OLS regression provides estimates of the coefficients for each independent variable, along with measures of statistical significance and goodness of fit (such as R-squared). These coefficients indicate how the dependent variable change in association with a one-unit change in the independent variable, holding all other variables constant. Overall, OLS regression is a widely used and reliable tool for analysing and modelling relationships between variables in several fields like economics, social sciences, and business.

Results

Descriptive statistics

Based on the summary statistics provided (see table 1), the mean age of the total households is 35.45 years, with a standard deviation of 11.79. This indicates that the households in the sample have a relatively wide age distribution, ranging from 15 to 87 years old. In comparing both groups - male and female, the mean age of females (35.05years) is slightly lower than that of males (35.81years). This slight difference may not have significant implications but could be considered in terms of healthcare needs and life stage considerations. The mean value for social protection (measured as government transfers) is 0.13, with a standard deviation of 0.33. This suggests that there is variability in the amount of government support received by households, with some receiving higher transfers than others. Both males and females have the same mean value for government transfers (0.12), indicating that there is no gender disparity in access to social protection programs in this context and lower proportion 12% of the household are covered by social protection interventions. Government transfers and social protection programs play vital roles in providing financial support to vulnerable populations, including female-headed households. These interventions can help alleviate the burden of out-of-pocket health expenditure by providing financial assistance for healthcare costs. Access to social protection programs can improve the financial stability of female-headed households, enabling them to prioritize their health needs and access necessary medical care.The mean out-of-pocket expenditure, measured by saving or borrowing for medical purposes, is 0.07, with a standard deviation of 0.26. This indicates that households are, on average, spending a relatively small proportion of their income on medical expenses. Males have a higher mean value for out-of-pocket expenditure (0.10 = 10%) compared to females (0.05 = 5%), suggesting that males may bear a greater financial burden when it comes to medical expenses. Female-headed households in China may face challenges in accessing affordable healthcare due to high out-of-pocket health expenditure. If these households are required to spend a significant portion of their income on medical expenses, it can lead to financial strain and limited access to essential healthcare services.

Table 1: Summary statistics

Variables	Total Respondents			Female Respondents			Male Respondents		
	1 Mean	2 [Std. Dev]	3 Min/Max	4 Mean	5 [Std. Dev]	6 Min/Max	7 Mean	8 [Std. Dev]	9 Min/Max
Age	35.45	11.79	15/87	35.05	10.78	15/78	35.81	12.62	15/87
SOP	0.13	0.33	0/1	0.12	0.33	0/1	0.13	0.34	0/1
OPX	0.07	0.26	0/1	0.05	0.22	0/1	0.10	0.30	0/1
Old	0.07	0.26	0/1	0.05	0.22	0/1	0.10	0.30	0/1
Inq	0.48	0.49	0/1	0.48	0.50	0/1	0.47	0.49	0/1
Fx1	0.90	0.29	0/1	0.90	0.28	0/1	0.90	0.29	0/1
Fx2	0.67	0.46	0/1	0.65	0.47	0/1	0.69	0.46	0/1
Fx3	0.77	0.41	0/1	0.72	0.44	0/1	0.81	0.38	0/1

Note: age mean age of the respondents in years, SOP means social protection, OPX means out-of-pocket expenditure, Old means save for old age (financial literacy), fx1 means Use mobile phone or app to pay for a purchase in-store; FX2 means Made bill payments online using the internet, and FX3 means send money to a relative or friend online using the Internet and mobile devices

Table 2: Regression result

Variable	Measurement	Total	Female	Male
Social protection	Received a government transfer, in-kind or in-cash support (Yes = 1, No =0)	2.0631*** (0.000)	3.0986*** (0.000)	1.2881** (0.003)
Out-of-pocket	Borrowed for medical purposes (Yes =1, No =0)	-22.945*** (0.000)	-1.7681** (0.020)	-24.6376*** (0.000)
Financial literacy	Saved for old age (Yes =1, No =0)	0.192*** (0.000)	2.192*** (0.000)	1.7221** (0.000)
Income Level	Income quintile of the household: 1 if the household falls in Fourth 20% and richest 20%, 0 if falls in poorest 20%, second 20% and middle 20%	-1.5122*** (0.000)	-0.4705** (0.036)	-2.3531*** (0.000)
Fin inclusion	Use mobile phone or app to pay for a purchase in-store	2.9625*** (0.000)	2.1847** (0.000)	1.1398*** (0.000)
Fin inclusion	Made bill payments online using the internet	1.5108*** (0.001)	1.5709*** (0.008)	1.3540** (0.032)
Fin inclusion	Send money to a relative or friend online using the Internet and mobile devices	2.6991*** (0.000)	2.2173*** (0.001)	3.4970*** (0.000)
Constant		4.1120*** (0.000)	21.1957 (0.000)	67.8571 (0.000)
Prob > F		0.0000***	0.0000***	0.0000***
R-squared		2.0950	4.0790	4.1154

Source: Authors Computaion

Note: *** and *** means significant at 1% and 5%.

High out-of-pocket health expenditure can also contribute to disparities in healthcare access and quality, impacting the overall health outcomes of female-headed households.

The mean value for saving for old age is also 0.07, with a standard deviation of 0.26. This suggests that households are similarly setting aside a small portion of their income for retirement or future financial security. Female-headed households in China may face challenges in accessing affordable healthcare due to high out-of-pocket health expenditure. If these households are required to spend a significant

portion of their income on medical expenses, it can lead to financial strain and limited access to essential healthcare services. High out-of-pocket health expenditure can also contribute to disparities in healthcare access and quality, impacting the overall health outcomes of female-headed households.

The mean income quintile of the household is 0.48, with a standard deviation of 0.49. This indicates that there is significant income inequality within the sample, with some households belonging to higher income quintiles than others. The mean income quintile for females (0.48) is slightly lower than that of males (0.49), indicating a slightly higher level of income inequality among male-headed households. The high means for using mobile phones or apps to pay for purchases in-store (mean = 0.90) and making bill payments online using the internet (mean = 0.67) suggest that households in the sample are technologically savvy and comfortable with digital financial transactions.

The mean value for sending money to a family or friend online making use of the internet and mobile devices is 0.77, with a standard deviation of 0.41. This indicates that online money transfers are a common practice among households in the sample. Both males and females show similar levels of engagement in using mobile phones or apps for in-store purchases, with a mean of 0.90. However, there is a slight difference in making bill payments online, with males (0.69) having a higher mean value compared to females (0.65). Additionally, males have a higher mean value for sending money online (0.81) compared to females (0.72), indicating differences in digital financial behaviour.

Regression analysis -OLS

Based on the results of the OLS analysis provided in table 2, we can make several observations. The significant positive coefficient values for social protection in total households (2.0631), females (3.0986), and males (1.2881) indicate that social protection programs have a positive association with life expectancy.

This implies that access to social protection interventions can catalyse the improved health status

and longer life expectancy among female-headed households in China. The significant positive coefficient values for saving for old age in total households (0.192), females (2.192), and males (1.7221) suggest that saving for old age is also positively associated with life expectancy. This highlights the importance of financial planning and preparedness for retirement in contributing to better health outcomes among female-headed households.

The negative coefficient values for out-of-pocket health expenditure in total households (-22.945), females (-1.7681), and males (-24.6376) indicate that higher out-of-pocket health expenses are associated with lower life expectancy. This underscores the financial burden of healthcare costs on female-headed households and the potential negative impact on their health outcomes. The negative coefficient values for income inequality in total households (-1.5122), females (-0.4705), and males (-2.3531) suggest that higher levels of income inequality are associated with lower life expectancy. Addressing income disparities within female-headed households could be crucial for improving overall health outcomes and life expectancy.

The positive coefficient values for using mobile phones or apps for in-store purchases, making bill payments online, and sending money online indicate that digital financial behaviours are associated with higher life expectancy. This highlights the potential benefits of leveraging technology for financial transactions and services among female-headed households in China. In conclusion, the results of the OLS analysis provide valuable insights into the relationships between social protection interventions, financial behaviours, healthcare expenses, income inequality, and life expectancy among female-headed households in China. These findings can inform policy interventions aimed at improving health outcomes and longevity within this demographic group through targeted social protection programs, financial planning strategies, and technology-enabled financial services.

Ethical approval: this is required in this work because the study did use human or animal subjects.

Discussion

Previous research has shown that access to social protection programs, such as health insurance, pension schemes, and social assistance, can have a pleasant effect on health outcomes and life expectancy [11, 12]. For example, Goudge[13] found that social health insurance contributes to universal coverage in South Africa, but generates inequities. Our results show that improvement in social protection interventions enhance life expectancy by 2 years (total household), 3 years (female household) and 1.3 years (male household). The significant positive coefficient values for social protection in our analysis support these findings and suggest that targeted interventions can help improve the well-being of female-headed households.

Further, studies have highlighted the importance of financial planning, savings, and **access to** financial services in enhancing improved health outcomes[4]. The positive coefficient values for saving for old age and technology usage in our analysis are consistent with this literature, indicating that sound financial behaviours and digital financial services can contribute to increased life expectancy among female-headed households. Research has consistently shown, validated by this study, that high out-of-pocket health expenditure can act as a barrier to accessing healthcare services and bring about poorer health outcomes. The negative coefficient values for out-of-pocket health expenditure in our analysis confirm this relationship and underscore the need for financial protection mechanisms to mitigate the impact of healthcare costs on vulnerable individuals.

Studies have also demonstrated that income inequality is connected with disparities in health status, with lower-income households often experiencing poorer health and shorter life expectancy[14]. The negative coefficient values for income inequality in our analysis are in line with this body of research, highlighting the detrimental effects of income disparities on the health of female-headed households. The findings from our analysis provide empirical evidence to support policy interventions aimed at addressing social protection gaps, promoting financial literacy, reducing healthcare expenses, and tackling income inequality among female-headed households.

By targeting these areas, policymakers can work towards improving health outcomes and life expectancy within this demographic group. In summary, the results of our analysis contribute to the existing literature by providing insights into the complex interplay between social protection interventions, financial behaviours, healthcare expenses, income inequality, and life expectancy among female-headed households in China. By building upon previous research findings, we can better understand the factors influencing health outcomes within this population and inform evidence-based policy strategies to enhance their well-being.

Strength and weakness

The strength of the study lies in the fact the study provides a thorough examination of the complex interplay between social protection interventions, financial behaviours, healthcare expenses, income inequality, and life expectancy within female-headed households, offering a holistic perspective on the concept. This study is among the very first to investigate this problem, focusing on female-headed households in china, to the author best of knowledge. However, the study has limitations, some of which is that the study lacks a detailed exploration of specific social protection programs or interventions that could be effective in improving health outcomes for female-headed households, potentially limiting the practical application of the findings. Also, the study focused on China only, and did not account for the diverse contexts and variations within female-headed households in other countries, potentially limiting the generalizability of the conclusions to different populations or regions.

Conclusion

The findings presented in this study underscore the critical importance of comprehensive social protection programs in supporting female-headed households and improving their health outcomes. By addressing financial behaviours, reducing healthcare expenses, and tackling income inequality,

policymakers can create a more equitable environment that promotes the well-being and longevity of vulnerable populations. Moving forward, a holistic approach that integrates social protection interventions with targeted healthcare initiatives and efforts to reduce income disparities is essential to enhance the overall health outcomes of female-headed households. By recognizing the interconnected nature of these factors, society can work towards creating a more inclusive and supportive environment for all individuals, regardless of their household structure.

Acknowledgement

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