Impact of Aging on Saving Rate: Evidence from China's Household Survey Data

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Abstract

China's population aging is accelerating, and its impact on the economy is becoming stronger. A critical aspect of the impact of population aging on the economy is the impact on saving rate. This article first analyzes the influence of aging population on household saving rate from the theoretical perspective of prevention and bequest motives in traditional Chinese society. Household survey data from the Chinese Family Finance Survey are then employed to construct empirical models. Household saving rate is discovered to be higher when the old-age dependency ratio in a family is higher. This is proposed to be because many Chinese people may not be sufficiently aware of that they should smoothen their consumption over their lifetime, because the current medical insurance and social pension systems in China are still imperfect, and because many older people are saving money to leave as inheritance.

***Keywords*:** household saving rate, population aging, dependency ratio

1. Introduction

The population of China has undergone considerable aging. In late 2017, China had an elderly population of 240 million, which accounts for 17.4% of China's total population according to the National Bureau of Statistics of China. Data on the world's predicted population in 2050, compiled by the United Nations, indicates that the dependency ratio of China will be 23.3% in 2050. The speed at which the country's population is aging and the size of its elderly population are higher than those in any other country.

Considerable change to the age structure of a population affects every aspect of the country's economy, and numerous developed countries have provided relevant examples in their processes of population aging. A report suggests that current population aging is a critical problem and is having severe consequences and profound implications for every aspect of human life (United Nations, 2001). In terms of the economy, population aging affects economic growth, saving, investment and consumption, pensions, taxation, and intergenerational asset transfer. From the social perspective, population aging influences citizens' health, health care, family composition, living arrangements, housing, and migration. In addition, population aging is an ongoing phenomenon. The proportion of elderly people in populations increased throughout the twentieth century and will continue to increase throughout the current century.

The severity and uniqueness of population aging has obliged scholars to deeply and carefully consider its profound impact on every aspect of the economy. This is particularly true for China, one of the world's largest and fastest developing countries. China is the fastest aging country worldwide, with the largest elderly population. Therefore, the present study considers China as a special case and investigates the economic impact of population aging. Assuming that the impact of population aging on the economy is comprehensive, the present study focuses on the influence of population aging on household saving rate. Identifying this influence has profound theoretical and practical value. Previously conducted studies regarding the impact of population aging on household saving have mostly examined the saving rate of one country as a whole, that of public sectors (government), or that of private sectors (businesses and households). Few studies have investigated the impact of population aging on household saving. The present study analyzes how the household saving rate is affected by population aging by adopting the perspective that a household is a microunit. The results of

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this study can serve as a reference for policy-makers; understanding how population aging affects household saving rate in China will enable more accurate prediction of changes in China's saving rate and how these changes may affect every aspect of economic production. China's economic growth has been driven by investment needs for a long period. Future decrease in household saving rate due to population aging will be a threat to China's investment-needs-driven economy. Macropolicies that account for changes in saving rate are needed.

The remainder of this paper proceeds as follows. Section 2 reviews the theoretical and empirical studies conducted on the effect of population aging on saving rate. Section 3 presents analysis of the impact of population aging on Chinese households' saving rate from a theoretical perspective, whereas Section 4 uses data from the China Household Finance Survey (CHFS) to conduct empirical analysis of the effect of population aging on China's household saving rate. Conclusions and policy suggestions are offered in Section 5.

2. Literature Review

In their study of the effect of a population's age structure on citizens' saving rates, Modigliani and Brumberg (1954) proposed life-cycle theory, which has been proven extremely influential. The theory proposes that the consumption of individuals tends to be constant over their life cycle. People save when they are working, accumulating money that they then spend during retirement. Consequently, their level of consumption only slightly changes once they retire. According to this theory, population aging entails increasing ratio of elderly population. As the age of a population increases, the saving rate of individuals exhibits a downward trend. Consequently, numerous scholars have conducted empirical studies on the relationship between a population's age structure and its household saving rate.

2.1 Cross-National and Cross-Regional Empirical Research

Most scholars employ data on one country or one area as their sample or conduct empirical research using cross-sectional data or panel data on multiple countries. For example, Leff (1969) uses cross-sectional data on 74 developing and developed countries to investigate the relationship between dependency ratio (among other factors) and citizens' saving rate. An increase in dependency ratio is discovered to be associated with a lower citizen saving rate. Arabsheibani and Cowling (2013) provide further evidence that the negative correlation between dependency ratio and saving rate remains valid and crucial for developing countries after the 1990s. Mason (1988) conducts a similar study employing time-series data on Asian countries in the 1970s and discovers support for the conclusion that a low dependency ratio is correlated with a high saving rate; Higgins and Williamson (1997) analyze panel data on Asian countries and also find that dependency ratio and saving rate are negatively correlated. Modigliani and Cao (2004) suggest that a change in the age structure of the Chinese population is a strong explanation for China's high saving rate. Hu (2015) investigates the causal relationship between demographics and savings in Japan, China, and South Korea by employing panel data and an innovative econometric technique: the panel Granger causality test. Brooks (2003) uses an overlapping generations (OLG) model to simulate global demographic transitions and predicts that the European Union and North America will experience a considerable saving shortfall due to population aging. Li, Zhang, and Zhang (2007) report that longevity has a positive effect and dependency a negative effect on savings, as determined using panel data from a World Bank data set containing 149 countries and 779 observations (Apergis & Christou, 2012; Tobing, 2012).

Some scholars have failed to obtain support for the life-cycle theory. For example, when using data from the Survey of Consumer Finances conducted by the US Federal Reserve Board in 1993, Carroll and Samwick (1997) find that only 15% of families were saving for retirement. This finding casts serious doubt on the validity of the life-cycle theory. In a study of categorized data from a consumption survey of different age groups in Austrian families, Aigner-Walder and Döring (2012) discover that instead of exhibiting decreasing saving rates during retirement, people show increasing saving rates. The authors conclude that work-related expenses are reduced or nonexistent during retirement and that retirees also tend to prepare or even grow their own food. In addition, as people grow older, their purchase desire often declines in terms of quantity and category; they also usually consider leaving money and assets for their heirs. Ram (2001) concludes that dependency ratio has no significant adverse effect on saving in the less-developed world. Mason, Ogawa, and Fukui (2010), using household survey data, also find that population aging does not lead to a substantial reduction in saving rate.

2.2 Research on Single Countries Conducted Using Time-Series Data

Some scholars focus on a single country and use time-series data to conduct empirical studies. Kim and Kim (2006) employ time-series data to empirically analyze the impact of South Korea's population aging on the country's saving rate. Koga (2006) analyzes Japan's time-series data in the 1990s and suggests that Japan's saving rate significantly decreased during that time because of a significant increase in its elderly population ratio, which caused a substantial change in its population structure. Horioka, Suzuki, and Hatta (2007) find that the rapid aging of Japan's population is causing Japan's household saving rate to decline and that this decline can be expected to continue. Braun, Ikeda, and Joines (2009) use a computable general equilibrium model to analyze the response of Japan's saving rate to changes in demographics and total factor productivity. The change in demographics is discovered to account for 2%–3% of the 9% decline in the Japanese national saving rate between 1990 and 2000. Horioka (2010) analyzes the impact of population aging on saving rate in Asia (with emphasis on Japan and China) and obtains the following findings: population aging leads to declines in the household, private, governmental, and national saving rates. Chen, İmrohoroğlu, and İmrohoroğlu (2007) and Abdelmawla and Yousif (2017) obtain similar conclusions. Park, Shin, and Whang (2010) report that in the United States, the effect of age distribution on saving rate is consistent with the life-cycle theory.

2.3 Research on China

Dong and Zhao (2011) investigate the relationship between population structure, economic growth, and household saving rates by using interprovincial panel data. The result suggests that increases in the youth dependency ratio and old-age dependency ratio are associated with decreases in saving rate. That is, while continuous societal development leads to increased proportion of elderly people in total population, household saving rates decrease as a result. Zheng (2007) uses a fixed effects model to analyze the panel data of various regions in China from 1985 to 2005 and identifies that saving rate is negatively correlated with youth dependency ratio and positively correlated with old-age dependency ratio. Data from regions are also used to discover that as life expectancy increases, saving rate also increases. Hu and Xu (2014) create pooled cross-sectional and virtual panel models, which identify a negative correlation between the saving rate of rural households and the elderly population ratio; for urban households, however, the saving rate increases as the elderly population ratio increases. Wang (2010) establishes a vector autoregressive model on the basis of Edwards's model and Chinese data from 1979 to 2009 to analyze the relationships between household saving rate and various factors such as nominal interest rate, household income growth rate, and old-age dependency ratio; household income growth rate and inflation are discovered to have had a stronger influence on saving rate than old-age dependency ratio. Zhang and Sun (2012), in accordance with life-cycle theory, analyze the data of 29 Chinese provinces from 1991 to 2010 to investigate the relationship between population age structure and saving rate, finding a positive correlation between old-age dependency ratio and household saving rate. Yao, Wang, Weagley, and Liao (2011) report that Chinese families are more likely to report a retirement saving motive than American families. By using Chinese panel data from 2000 to 2014, Xu (2016) finds that the old-age dependency ratio of China positively affects the saving rate of urban households but negatively affects that of rural households.

Research on the relationship between population aging and household saving rate is abundant. However, most studies have analyzed the effect of population aging on household saving rate through the use of macrodata; few studies have employed microdata. Most microdata studies focus on the effect of the age of the head of household on saving rate. However, it is widely acknowledged that the age of the head of household is insufficient for directly describing the relationship between population aging and household saving. Therefore, in-depth investigation and analysis on the effect of a household's old-age dependency ratio on its saving rate is required. Therefore, the present study builds on the aforementioned literature and investigates the impact of household aging on household saving.

3. Theoretical Analysis and Research Hypothesis

What factors influences saving rate is a classical problem in the field of economics. A considerable amount of research has been conducted on saving behavior. From the micro perspective, how people spend and save the money they earn and the proportion of money that is spent versus saved is a complex problem. Keynes performs in-depth analysis of the saving problem in his book entitled *The General Theory of Employment, Interest, and Money*. He proposes that marginal propensity toward

consumption is diminishing and thus a marginal propensity toward saving is incremental. When people's income increases, their increase in consumption is slower than their increase in saving. Therefore, average saving rate is influenced by household income; the higher the household income, the higher the average household saving. The subsequently proposed permanent income hypothesis and life-cycle hypothesis complement this problem from the perspective of long-term disposable income and the life-cycle theory. The life-cycle theory is pertinent to this study's examination of the impact of population aging on household saving rate. As previously discussed, the life-cycle theory holds that individuals have approximately constant consumption over the course of their lives. They save money during their adult years when their income is relatively high and spend their savings when they are retired. Consequently, the saving rate is high among younger adults and becomes lower or even negative when people retire. According to the life-cycle theory, due to individuals' motivation to keep their consumption constant, the amount people save is to be affected by their age and may become negative during old age.

Precautionary motives are crucial reasons why people save money. People save money with a precautionary motive to ensure that they can cope with unpredictable expenses in the future. When the proportion of elderly people in the population increases, the size of the working age population decreases, and the amount of money available for saving decreases. Additionally, elderly people usually have poorer health and are more likely to develop illnesses, thereby incurring medical expenses. Because the social insurance and social security systems in China are not well-developed, households mostly have to rely on themselves to pay for medical expenses. The precautionary motives regarding medical expenses may lead families with a higher proportion of elderly members to have household savings. If elderly people have income from a pension, precautionary motives are weaker. Even when retirees have pensions, population aging would still positively affect saving rate due to precautionary motives. However, the positive effect of population aging on saving rate would be weaker.

In Chinese culture, the motive to leave inheritance is also a critical factor influencing people's saving behavior. Being affected by traditional Chinese customs, many elderly people wish to leave an inheritance to their descendants. Under the premise that they have sufficient money to meet their basic needs, elderly people may save money to leaving an inheritance; in other words, such a saving behavior is driven by a bequest motive. Additionally, China does not have inheritance tax, as is the case in the United States and United Kingdom. Descendants inherit an estate without paying any tax and may even gain from interest generated by the estate, which, to some extent, has led to increasing amounts of money being saved in China out of a bequest motive. Therefore, household saving rate may continue to increase in China along with the country's population aging.

Overall, for a micro household unit, population aging may thus not necessarily have a negative impact on household saving rate. According to life-cycle theory, elderly people do not have any income, but elderly people in China often have some income (e.g., farmers' pension for rural farmers, and most urban elderly people also receive a pension or retirement allowance). Therefore, under precautionary and bequest motives, elderly people's saving rate may not decrease but increase. The predictions made by life-cycle theory may not be realistic for China. The present study thus proposes the following research hypotheses according to aforementioned theoretical analysis:

Hypothesis 1: The proportion of elderly members in a family has a positive effect on household saving rate.

Hypothesis 2: The more elderly members in a household receive retirement allowance or pension income, the weaker the family's precautionary motive. Although the proportion of elderly members in a family has a positive effect on household saving rate, this positive effect weakens when a greater proportion of the household's elderly members have an income during retirement.

4 Empirical Analyses

4.1 Data Source and Variables

The data used in the present study are obtained from the CHFS, which was performed by Southwestern University of Finance and Economics in December 2011. The quality of these data is approved for use in academia, and the data are widely used in the study of household financial problems.

We process and calculate data regarding annual household consumption. Consumption rate equals annual household consumption divided by annual household income. Household saving rate equals 1 minus the consumption rate.

With reference to other related studies, we exclude outliers, such as household saving rates that are higher than 1 or less than −2 and household income that is less than 0. Table 1 lists the names of the variables, their meanings, and descriptive statistics.

Table 1 Descriptive Statistics

Variable	Meaning	Obs	Mean	Std. Dev.	Min	Max
savingrate	Household saving rate	6612	0.286	0.442	-1	0.995
lnincome	Logarithm of household income	6612	10.428	1.042	5.704	14.91
eldratio	Proportion of family members aged over 64 years	6612	0.143	0.292	0	1
childratio	Proportion of family members aged under 15 years	6612	0.116	0.157	0	0.75
hheadmale	1 if the head of the household is male; 0 otherwise	6612	0.546	0.498	0	1
hheadedu	Higher value equals higher education level of head of household	6612	3.459	1.727	1	9
hheadage	Age of the head of household	6612	49.222	14.314	16	94
hheadmarried	1 if the head of household is married; 0 otherwise	6612	0.873	0.333	0	1
hheadwork	1 if the head of household is employed; 0 otherwise.	6612	0.695	0.46	0	1
pension	Number of family members with social health insurance	6612	0.337	0.654	0	2

4.2 Model Settings

The factors influencing household saving rate may be numerous, and many scholars have discussed this issue. The objective of this study is to investigate the impact of population aging on household saving rate. We thus formulate the following empirical model:

$$savingrate = \beta_0 + \beta_1 \times eldratio + \beta_2 \times childratio + \beta_3 \times lnincome + \beta 4 \times hheadmale + \beta_5 \times hheadedu + \beta_6 \times hheadage + \beta_7 \times hheadmarried + \beta_8 \times hheadwork + \varepsilon$$

where the variables are defined as in Table 1.

4.3 Empirical Results and Analysis

The present study employed multiple linear regression to verify Hypothesis 1, and the results of the analysis are presented in Table 2.

Table 2 Results of Standard Regression Model

VARIABLES	(1) savingrate	(2) savingrate	(3) savingrate	(4) savingrate
Eldratio	0.088***	0.076***	0.199***	0.108***
	(0.018)	(0.019)	(0.018)	(0.021)
Childratio		-0.093***	-0.118***	-0.055*
		(0.035)	(0.032)	(0.033)
Lnincome			0.173***	0.222***
			(0.005)	(0.005)
Hheadmale				-0.003
				(0.010)
Hheadedu				-0.041***
				(0.003)

Hheadage				0.005***
				(0.000)
Hheadmarried				-0.053***
				(0.015)
Hheadwork				0.115***
				(0.012)
Constant	0.274***	0.287***	-1.531***	-2.181***
	(0.006)	(0.008)	(0.051)	(0.063)
Observations	6,705	6,705	6,705	6,612
R-squared	0.003	0.005	0.165	0.213

Standard errors are placed in parentheses; *** $p < .01$, ** $p < .05$, * $p < .1$.

All four regression models indicate that a higher proportion of elderly people in a family are associated with a higher household saving rate; thus, Hypothesis 1 is supported. The Chinese are more willing to spend money for their children than the elderly in Chinese society. The status of elderly people in a family tends to be functional, and they are expected to spend little and accumulate wealth for their descendants. The savings of elderly family members are commonly spent on the consumption and education of their children and grandchildren. Bequest motives explain the phenomenon of higher saving rate when the number of elderly people in a household is higher.

Furthermore, due to the existence of precautionary motives, elderly people are active in saving. Medical and longevity risks in the elderly population are high, resulting in high uncertainty about future expenses. This instills in them a desire to save money to cope with future uncertainty. Under the influence of precautionary motives, elderly people are likely to be active in their saving behavior. Consequently, a higher proportion of elderly people in a family are associated with a higher household saving rate.

A higher proportion of children are associated with a lower household saving rate. This is consistent with the aforementioned phenomenon of favoritism of children over elderly people. In traditional Chinese culture, one generation saves money for the benefit of the next generation. Therefore, emphasis is placed on spending and investment in children. In a household, a higher proportion of children indicate a higher amount of spending in the family, leading to a lower saving rate. An increase in income would lead to a higher household saving rate, which is consistent with the predictions of the Law of Diminishing Marginal Propensity to Consume proposed by Keynes. Description of the regression analysis results for other control variables is excluded herein.

All four regression models obtained the same conclusion: that a higher old-age dependency ratio is associated with a higher household saving rate. Hypothesis 1 is supported. To further verify the validity of Hypotheses 1 and 2, we calculate the number of family members with a pension income or retirement allowance and use this as a basis for conducting regression analysis. This analysis is performed to determine whether lower precautionary motives is associated with a weaker positive effect of proportion of elderly people in the household on household saving rate. The results are displayed in Table 3.

Table 3 Results of Regression Model to Verify Hypothesis 2

VARIABLES	(5) pension=0 savingrate	(6) pension=1 savingrate	(7) pension=2 savingrate
Eldratio	0.258***	0.230***	0.101***
	(0.030)	(0.033)	(0.028)
Childratio	-0.121***	-0.094	-0.044
	(0.036)	(0.116)	(0.129)
lnincome	0.173***	0.231***	0.132***
	(0.006)	(0.015)	(0.015)
Constant	-1.529***	-2.167***	-1.039***
	(0.060)	(0.155)	(0.165)
Observations	5,125	890	690
R-squared	0.153	0.228	0.111

Standard errors are placed in parentheses; *** $p < .01$, ** $p < .05$, * $p < .1$.

The results clearly demonstrate that when the number of family members with pension income is 0, every 1% increase in the proportion of elderly family members is associated with a 0.26% increase in household saving rate. When the number of family members with pension income is 1, every 1% increase in the proportion of elderly family members is associated with a 0.23% increase in household saving rate. When the number of family members with pension income is 2, every 1% increase in the proportion of elderly family members is associated with a 0.10% increase in household saving rate. Thus, the presence of more family members with pension income indicates a weaker positive effect of the proportion of elderly family members on household saving rate, despite the positive effect remains significant. This provides support for Hypothesis 2, which states that precautionary motives influence the saving behavior of elderly people. If elderly people in a family have relatively strong precautionary motives, they tend to engage in saving more actively; under such circumstances. The proportion of elderly family members has a stronger positive effect on household saving rate.

5. Discussion and Conclusion

The trend of population aging continues to accelerate in China, and other major economies have either experienced or are experiencing this unprecedented demographic change. The impact of population aging on the economy is comprehensive and profound. This study analyzes the impact of population aging on one aspect the economy, namely household saving rate. We use the microunit, the family, as the research subject. Relevant studies are reviewed, and most scholars are found to focus on the impact of population aging on regional saving rate. This is a crucial topic, but we opt to elucidate the influence of population aging on micro population units because we consider such an influence as a basis for studying the influence of population aging on the saving rate in macroeconomics. Moreover, a few studies investigating the impact of population aging on household saving rate have some flaws. For example, using the age of the head of the household as a proxy variable for population aging is unsound in terms of methodology; such a method fails to accurately reflect the extent of population aging in a family. Therefore, the present study makes some improvements in this aspect.

The theoretical part of this study focuses on investigating the impact of population aging on saving rate under precautionary and bequest motives. In disagreement with life-cycle theory, we determines that the theory's premises and hypotheses may be invalid for Chinese populations because of the special cultural background behind bequest motives in Chinese families and the incompleteness of China's social insurance system. Two hypotheses are proposed in this study. First, the proportion of elderly members in a family has a positive impact of household saving rate. This is a result of the dual effect of precautionary and bequest motives in traditional Chinese family values. Second, the more elderly members in a household receive retirement allowance or pension income, the weaker the family's precautionary motive. Although the proportion of elderly members in a family has a positive effect on household saving rate, this positive effect weakens when a greater proportion of the household's elderly members have an income during retirement.

Through formulating empirical regression models and applying data from a household finance survey, we analyze the impact of population aging on household saving rate. The results show that higher proportions of elderly people in a family lead to higher household saving rates. The results provide support for the research hypotheses but contradict life-cycle theory. We believe this to be because the tenets of life-cycle theory are inconsistent with the current economic environment faced by families as micro subjects. For example, the life-cycle theory states that elderly people have no income, but most current elderly people have a source of income, whether it be a pension, retirement allowance, or work income. Moreover, the life-cycle theory proposes that people save when they are young to give themselves a pension, but this also diverges from the reality in China. In traditional Chinese culture, money is saved during youth to then be spent on the next generation, such as on their education and marriage. That saving rate decreases as age increases, as is proposed by the life-cycle theory, may not apply to contemporary China.

In explaining the positive effect of population aging on household saving rate, this study consider the dual effect of precautionary and bequest motives to be the cause. When a family is faced with higher risk, the positive effect of population aging on household saving rate is stronger. We divide the households into three groups according to the different number of family members who receive a pension income. Investigation of the three groups show that regardless of the number of family

members who receive a pension income in a household, population aging had a positive effect on household saving rate. Additionally, the higher number of family members with pension income, the weaker the positive effect of population aging on household saving, which supports the precautionary mechanism proposed in this study.

The main contributions of the present study are as follows. First, microunit data (household data) are employed. This study thus compensates for the inadequacies of previous research, which has focused only on macrodata, such as regional economy and macroeconomic data. Second, we analyze the impact of population aging on household saving rate from two perspectives: precautionary motive and bequest motive. This enables us to discuss the inapplicability of the life-cycle theory and the limitation of its hypotheses. Household saving rate is discovered to increase as the proportion of elderly members in a family increases, which contradicts the life-cycle theory. We provide three reasons for this contradiction: the current economic climate is considerably different from that considered by the life-cycle theory; bequest motive plays a crucial role in Chinese culture; and precautionary motive driven by the incompleteness of China's social security system is also an important factor influencing household saving rate.

From our conclusions, we can surmise that if population aging further accelerates in China, the country's household saving rate may not decrease but increase. However, as China's pension system and medical insurance system mature, the relationship between household saving rate and population aging may change. In summary, the present study proposes that saving rate does not decrease as a population ages and therefore does not have a negative impact on investment, one of the engines driving China's economy. Thus, population aging will not necessarily have a negative effect on the economy in the future. Moreover, according to the conclusion of present study, we can predict that even though population aging accelerates, future long-term interest rates may not rise as a consequence of fund insufficiency, which used to be considered as a result of population aging. This also has a certain degree of implication for the main participants in the financial market. If the government wishes to increase consumption and decrease household saving to boost the economy, they should put more effort into increasing the consumption of young people and children, such as by reducing the tax on children's products and education services; doing so will prevent saving due to bequest motives in Chinese families. If decreasing saving rate driven by precautionary motives is desirable, further increasing the coverage of social insurance and promoting the development of commercial insurance will be helpful.

The main limitation of this study is the data that it employed. If a long-term follow-up study of households can be conducted, more evidence regarding the relationship between household saving rate and population aging can be obtained, thereby deepening the understanding of the theoretical problem with the life-cycle theory hypotheses. Future research should be conducted with deeper analysis of the saving motives of microunits. For example, analyzing changes in household saving behavior during the development of the social insurance system and the factors influencing elder people's bequest motives will provide more evidence for the predictions of saving rate changes.

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A Cross-Country Analysis of Population Aging and Financial Security

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Abstract

Throughout the world, policy makers are concerned about the impact that population aging will have on households' financial security, especially those groups most likely to be vulnerable—women, the less educated, and the poor. We use data from the *2014 World Bank Global Findex* and supplement it with macroeconomic indicators of old-age security to investigate the financial security of households across both developed (OECD) and developing (non-OECD) countries with various aging populations. Five fundamental indicators of financial security are examined. Results show an aging effect for all measures. The aging effects are largest for those who report saving for old age. Older age groups living in countries with larger aging populations are more likely to save, regardless of OECD status. Also, those who are female, have less education, and lower incomes are particularly vulnerable, especially those living in developing countries. Further, the financial security of those living in non-OECD countries is significantly more likely to be affected by public pension spending and other key indicators of old-age security. Financial inclusion and technological usage also have a significant and positive impact on financial security. These factors could play a key role in promoting savings and improving financial security in aging populations worldwide. The findings from this study have important policy implications given the pressures that some countries' social support and public transfer systems will face in the coming years.

JEL Classification: D10, D14, D31, E21, G10, G20, H55, J10, J11, 017, R20

Keywords: population aging, financial security, savings, financial inclusion, old age, retirement, public pension spending

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The Fertility Policy, Ageing Population and the Actuarial Balance of Urban Employees Basic Medical Insurance Fund

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Abstract

This article studied on the effect of fertility policy changes, reducing the pressure of urban employees basic medical insurance brought by the population aging, as well as the problems which urban employees basic medical insurance will continue to face under the new fertility policy. This article used the Poisson regression model to analyze the factors of fertility desire of childbearing women, the adjusted fertility rate according to the regression results, and improved the Leslie matrix to prospect the demographic situation under different fertility policies. This article established the actuarial balance model of urban employee basic medical insurance to prospect urban employee's basic medical insurance of pooling fund balance under different fertility policies. The results showed that the fertility policy adjustments do not affect pooling fund balance in the short term, but in the long run, it will reduce the pressure on urban employee's basic medical insurance brought by the population aging. In addition, the urban employee's basic medical insurance will continue facing some difficulties such as decelerating of economic growth and fast- expanding of medical expenses.
Keywords: urban employee's basic medical insurance; fertility policy; population forecast; insurance fund; the long-term balance of pooling funds

Introduction

The general source of a series of population problems in China, such as the demographic dividend disappearing, labor shortage, and population aging, is that the birth rate caused by the family planning policy is too low. Increasing the fertility rate can solve the problem of population aging (Zweifel and Felder, 1999). In 2007, China began to open the fertility policy, which states that, if both spouses are the only child, they can have a second child. 'The Decision on Major Issues Concerning Comprehensively Deepening Reforms' issued by the Central Committee of the Communist Party of China in 2013 marked the formal promulgation of the selective second-child policy. After the transitional birth policy, on 29th October 2015, upon the approval of the Fifth Plenary Session of the 18th National Congress of the CPC, China will fully implement the policy that will permit couples to have two children. The universal two-child policy will fundamentally change the demographic structure and it is conducive to adjusting the trend of population aging in China. The gradual settlement of the population aging problem will undoubtedly ease the pressure of the gap in the social basic medical insurance pooling funds in our country. However, changes in the fertility policy will not immediately affect urban employee's basic medical insurance in China. In other words, the population aging of our country, population structure problems such as labor shortage and population aging will still affect the balance of urban employee's basic medical insurance funds.

Literary review

Some scholars have done research on the growth of medical expenses and the balance of income and expenditure of medical insurance funds in the context of population aging. Most of them hold the belief that, the population aging will lead to a rapid increase in medical expenses, which will cause an increased expenditure of the medical insurance funds. For example, Lee and Miller (2002) use a random time series model to predict future Medicare expenditure in the United States and find

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that the ratio of Medicare to GDP will increase from 2.2% in 2000 to 8% in 2075. Hsu and Liao (2015) use a dynamic stochastic general equilibrium model to study the impact of rapid population aging on financing the national medical insurance funds in Taiwan, and find that the government has to mobilize additional labor income tax to finance its expenditure. In addition, Voncina (2010), Yamada et al. (2011), Hsu et al. (2015) deal with the same issue for the cases of Croatia, Japan, and Thailand, respectively. Meijer et al. (2013) find that population aging will lead to an increase in medical expenses by affecting relevant social variables. Chambers (2012), Blomqvist et al.(2014) also have similar conclusions. Jing et al.(2016) consider the situation of raising the retirement age, and he makes assumptions on the parameters affecting the balance of income and expenditure of the pooling funds and establishes a model to estimate the year in which the current balance and the accumulated balance will run out.
In addition to using general statistical methods, scholars also use actuarial methods to study the long-term income and expenditure balance of urban medical insurance funds in the context of population aging. He et al.(2011) combines the non-life insurance actuarial model with the life insurance actuarial model to reveal the trend of population aging in the urban medical insurance system and analyze the impact of this trend on the long-term balance of medical insurance funds. Xie et al.(2018) use the Poisson log-bilinear model to predict the mortality rate and grey correlation degree GM (1,1) model to predict the fertility rate. They holds the view that, the balance of the urban employee's basic medical insurance fund in China will not run out in the short term, but there will be a shortfall in the long term. Lim (2016) uses the stochastic aging and dying processes and the idiosyncratic shock processes to analyze the impact of the population aging on the budget-balancing national health insurance premium rate. The analysis reveals that, the premium rate for workers should be increased by 3.7 percentage points between 2015 and 2060 to finance the augmented burden of the health insurance program as a result of the population aging. Based on a stochastic general equilibrium overlapping generations' model, Jung (2017) finds that population aging not only leads to large increases in medical expenses but also a large shift in the relative size of private versus public insurance. Dong (2015) conceive that under the current basic medical insurance policy, the income and expenditure of the pooling funds are not sustainable in the long term, and the gap between income and expenditure is enormous.

Many scholars have neglected another policy that can improve the balance of urban employee's basic medical insurance funds, that is, adjusting the birth policy. Zeng et al. (2014) believe that the universal two-child policy can improve the financial operation of the new rural cooperative medical insurance fund. In contrast, more scholars have begun to explore the impact of fertility policy on pension insurance funds. Holthausen et al. (2012), and Zuchandke et al. (2014) all holds the views that fertility policy can promote the sustainable operation of pension insurance funds. Predictive analysis of demographic structure is very difficult when considering the impact of fertility policies. Zhai et al. (2014) based on the 2005 national population data, combined with other data to estimate the number of the only child in 2012, and they also estimate the number of women of childbearing age who have only one child, that is, the target population of universal two-child policy. Furthermore, the number of children born as a result of the opening of the fertility policy is measured year by year. They believe that the birth population of China will increase sharply after the opening policy, thus slowing down the population aging trend. Feng et al. (2015) combine previous studies on the factors affecting the fertility rate in China and prediction of women of childbearing age who meet the selective two-child policy in order to calculate the total fertility rate(Bolton et al.,2016). Assuming that all women of child-bearing age will continue to have children after the opening of the fertility policy, they believe that the selective second-child policy will be effective and suggest that the fertility policy can continue to be liberalized. In addition, Jafari et al. (2017) use the multiple streams model (Alonso-García et al., 2016) to analyze the population policy in Iran.

At present, the population forecast model is relatively mature, but there are fewer models under the universal second-child policy. The idea is to use the segment of the population to find the target population, and then make predictions based on the assumptions about the absolute increment in policy changes. This method is more suitable for the short-term. Considering that the fertility policy has a long-term effect on the urban employee's basic medical insurance funds, this article attempts to estimate the population of China using a population forecast model whose fertility rate is adjusted according to the fertility desire. In addition, this article establishes the actuarial balance model to assess the balance of urban employee's basic medical insurance funds.

Population structure forecast under the latest fertility policy in China

Based on the existing data and the existing research, this article establishes a probabilistic model to study the impact of changes in the fertility policy on the fertility rate. And it proposes a more

reasonable and effective method for predicting the fertility rate in China when the fertility policy is adjusted.

The data used to analyze the fertility desire in this article are based on the 2013 CGSS (China General Society Survey) data released in 2015. The survey respondents came from 28 provinces and municipalities, and their ages are in the range of 16 to 96. The age structure of this survey is basically the same as the age structure of the entire Chinese population and it has a strong representation. After excluding the invalid data on the fertility desire questions and other related questions, there are a total of 11,174 data in the final, including 3164 childbearing women from 16 to 49 years old.

Determination of factors affecting fertility desire

This article uses the SAS system to construct the Pearson Chi-square test and analyzes whether there is a significant difference in fertility desire between people with different gender, age, nationality, educational level, registered residence status, marital status, openness and equality between men and women. The article uses Poisson regression to analyze the number of births and constructs a generalized linear model (GLM model). Assuming that the explanatory variables obey the Poisson distribution (Wang and Famoye, 1997), choose the Log connection function to establish the following Poisson regression model:

$$P(Y_i = y_i \left| x_i \right.) = \frac{e^{-\lambda_i} \lambda_i^{y_i}}{y_i !} (y_i = 0,1,2\cdots) \tag{1}$$

Where y is the difference between fertility desire and fertility behavior, x represents age, education level, marital status, registered residence, ethnicity, family status, job status, sexual attitudes, the attitude of equality between men and women and fertility freedom. According to the results of type III ANOVA, choose age (AGE), education level (EDF) and marital status (MARR) factor, all of them are significant at 0.01 level. The following is the Poisson regression formula for **female re-fertility desire**.

$$\begin{aligned} E(\mathrm{BDIF}_i|x_i) = \exp(&0.3795 - 0.0232 AGE_i + 0.1574 EDU_i - 0.6558 Factor\left(MARR\right)1_i \\ &-0.4760 Factor\left(MARR\right)2_i - 1.0002 Factor\left(MARR\right)3_i) \end{aligned} \tag{2}$$

Where BDIF indicates the **re-fertility desire** and is numerically equal to the difference between the ideal number of children (IC) and the current number of children (CC).

Fertility adjustment, Leslie matrix, and population prediction

When analyzing the impact of population structure on urban employee's basic medical insurance, we need to know that the current retirement age of men and women are different under the current policy in China. So the ratio of men to women needs to be taken into account in the demographic structure. In this article, the unisex Leslie matrix (Hsu et al., 2015) is extended to the bisexual matrix:

$$\mathrm{M}=\begin{pmatrix} b_0^F & b_1^F & \cdots & b_{99}^F & b_{100}^F & 0 & \cdots & \cdots & \cdots & 0 \\ S_0^F & & & & \vdots & \vdots & & & & \vdots \\ \vdots & S_1^F & & & \vdots & \vdots & & & & \vdots \\ \vdots & & \ddots & & \vdots & \vdots & & & & \vdots \\ 0 & \cdots & \cdots & S_{99}^F & S_{100}^F & \vdots & & & & \vdots \\ b_0^M & b_1^M & \cdots & b_{99}^M & b_{100}^M & 0 & \cdots & \cdots & \cdots & 0 \\ 0 & \cdots & \cdots & \cdots & 0 & S_0^M & & & & \vdots \\ \vdots & & & & \vdots & \vdots & S_1^M & & & \vdots \\ \vdots & & & & \vdots & \vdots & & \ddots & & \vdots \\ 0 & \cdots & \cdots & \cdots & 0 & 0 & \cdots & \cdots & S_{99}^M & S_{100}^M \end{pmatrix} \tag{3}$$

Where b_i^F is the **girls' fertility rate** for a female population of age i, b_i^M is the **boys' fertility rate** for a female population of age i, S_i^F is the survival rate for a female population of age i, S_i^M is the survival rate for a male population of age i. In the bisexual Leslie matrix model, the expression of the initial population vector $P^{(t)}$ also changes accordingly. The expression of $P^{(t)}$ is as follows:

$$P^{(t)} = (P_0^F, P_1^F, \cdots P_{99}^F, P_{100}^F, P_0^M, P_1^M, \cdots P_{99}^M, P_{100}^M)' \tag{4}$$

Where P_i^F indicates the number of females at age i in year t, and P_i^M indicates the number of males at age i in year t. Same as the unisex Leslie matrix model, in t + n years, the population prediction result is:

$$P^{(t+n)} = M^{(n)} P^{(t)}$$

The family planning policy in China has affected the fertility rate. The main influence mechanism is: The number of children born to a family is limited in our country through legislation so that fertility rate has been at a low level over a long period of time in the context of family planning policy.
Assumptions:
(1) When the education level, age, and marital status are the same, re-fertility desire of each woman are independently distributed;
(2) The proportion of female's re-fertility desire converted into the actual birth of children is only related to the age of female and not affected by the change of policies.
(3)The current number of children is only related to the age of the female.
The single point of fertility rate in the demographic study is calculated as:

$$b_{ijm} = \frac{CP_{ijm}}{P_{ijm}^F} \tag{5}$$

Where b_{ijm} is the fertility rate of a woman whose age is i, education level is j and marital status is m, CP_{ijm} is the total number of children of a woman whose age is i, education level is j and marital status is m. P_{ijm}^F is the total number of women whose age is i, education level is j and marital status is m. Based on the independent identity distribution assumption as above, CP_{ijm} , the total number of children born to women whose age is i, education level is j and marital status is m can be expressed as:

$$E[CP_{ijm}] = k_i \sum_n E_{ijmn}[LBDIF_{ijmn}] \tag{6}$$

In the above formula, k_i is the proportion of i-year-old female's re-fertility desire converted into the actual birth of children, the proportion is only decided by age, education level and marital status. $LBDIF_{ijmn}$ is **the total number of legal desire of** the nth woman whose age is i, education level is j and marital status is m, which can be further expressed as:

$$LBDIF_{ijmn} = \min(BDIF_{ijmn}, \max(LLNC_{ijmn} - CNC_{ijmn}, 0)) \tag{7}$$

Where $BDIF_{ijmn}$ is the re-fertility desire of the nth woman whose age is i, education level is j and marital status is m, and it is the difference between the ideal number of children and the current number of children. $LLNC_{ijmn}$ is **maximum number of legitimate children** of the nth woman whose age is i, education level is j and marital status is m under the current-stage policy. CNC_{ijmn} is the current number of children of the nth woman whose age is i, education level is j and marital status is m. Under different policies, the adjustment coefficient among the fertility rate of sub-divided female groups can be expressed as:

$$\rho_{ijm} = \frac{b_{ijm}^2}{b_{ijm}^1} \tag{8}$$

In the above formula, b_{ijm}^1 represents the fertility rate of the woman whose age is i, education level is j and marital status is m under policy 1, the same applies to b_{ijm}^2 .
Substituting (5), (6) and (7) into the above formula, we can get:

$$\rho_{ijm} = \frac{E[LBDIF_{ijm}^2]}{E[LBDIF_{ijm}^1]} = \frac{E[\min(BDIF_{ijmn}, \max(LLNC_{ijm}^2 - CNC_{ijmn}, 0))]}{E[\min(BDIF_{ijmn}, \max(LLNC_{ijm}^1 - CNC_{ijmn}, 0))]} \tag{9}$$

The fertility rate for women aged i is defined as:

$$b_i = \frac{CP_i}{P_i^F} = \frac{\sum_{j,m} CP_{ijm}}{\sum_{j,m} P_{ijm}^F} \tag{10}$$

Where CP_i is the total number of newborns born to the women aged i and P_i^F represents the total number of women aged i. Substitute (5) into (10) , we can get:

$$b_i = \frac{\sum_{j,m} P_{ijm}^F * b_{ijm}}{\sum_{j,m} P_{ijm}^F} = \sum_{j,m} \pi_{jm} * b_{ijm} \tag{11}$$

Therefore, the adjustment coefficient among the fertility rate of the women of age i under different policies is:

$$\rho_i = \frac{b_i^2}{b_i^1} = \frac{\sum_{j,m} \pi_{jm} * b_{ijm}^1 * \rho_{ijm}}{\sum_{j,m} \pi_{jm} * b_{ijm}^1} \tag{12}$$

Population forecast based on adjusted fertility rate

Based on the results of the previous GLM model, bring age, education level and marital status to the model. We can calculate the expected **re-fertility desire** of the nth woman whose age is i, education level is j and marital status is m, and it can be denoted as λ_{ijmn}. Then the corresponding probability distribution is Poisson distribution.

The essence of implementing the selective second-child policy is: the universal second-child policy is implemented for the childbearing women who satisfy the condition of the selective second-child policy, and one-child policy is implemented for the others. Assuming that by the end of 2010, the population of childbearing women who satisfy the condition of the selective second-child policy between 15 and 30, 31 and 39, 41 and 49 is 24.7711million, 3.743 million and 0.853 million, respectively[4]. Calculate the population proportion meeting the condition of selective second-child policy in each age group. Estimate the expectation under the selective second-child policy, and calculate the fertility rate adjustment multiplier of the childbearing women at all ages, then we can get the fertility rate, and the results are shown in Figure 1.

According to the bisexual Leslie matrix method, assumed the same mortality rate since 2010, predict the population from 2011 to 2050 in China. In addition, according to the newborns' sex ratio from 2008 to 2014 released by the National Health and Family Planning Commission, This article selects a five-year average of 45.85% as the newborns' sex ratio in 2015-2055. The estimated number of insured people is shown in Figure 2.

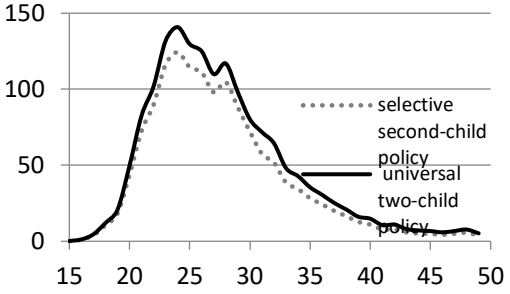

Figure 1The adjusted fertility rate for the selective two-child policy and the universal two-child policy

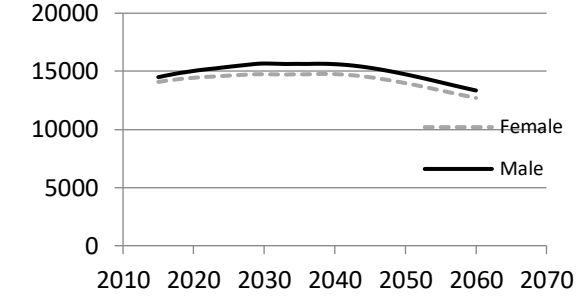

Figure 2 Number of insured people by age and sex (Unit: 100 million)

Result analysis

Urban employee's basic medical insurance fund actuarial model based on population prediction

1 Income actuarial model

The income actuarial model is constructed as follows:

$$CI(t) = \sum_m \bar{W}_{m,t}^F * C_{m,t}^F * P_{m,t}^F * R_{m,t}^F + \sum_n \bar{W}_{n,t}^M * C_{n,t}^M * P_{n,t}^M * R_{n,t}^M \tag{13}$$

Where $\bar{W}_{m,t}^F$ represents the average wage of women at age m in year t, $C_{m,t}^F$ represents the total number of insured people of women at age m in year t, $P_{m,t}^F$ represents the contribution rate of the

[4]Based on Wang Guangzhou (2012), an estimated number of childbearing women who satisfy the condition of the selective second-child policy in each age group.

Urban employee's basic medical insurance for women at age m in year t paid by the employers. $R^F_{m,t}$ represents the contribution ratio for women at age m in year t. $\overline{W}^M_{m,t}$ represents the average wage of men at age m in year t, $C^M_{n,t}$ represents the total number of insured people of men at age m in year t, $P^M_{n,t}$ represents the contribution rate of the Urban employee's basic medical insurance for men at age m in year t paid by the employers. $R^M_{n,t}$ represents the contribution ratio for men at age m in year t.

2 Expenditure Actuarial Model

Expenditure actuarial model is constructed as follows:

$$TE(t) = \sum_k l^F_{t,k} * mc^F_{t,k} + \sum_k l^M_{t,k} * mc^M_{t,k} \quad (14)$$

Where $l^F_{t,k}$ is the number of insured women at age k in year t, $mc^F_{t,k}$ is the per capita medical expenses paid by the pooling funds for the insured women at age k in year t. $l^M_{t,k}$ is the number of insured men at age k in year t, $mc^M_{t,k}$ is the per capita medical expenses paid by the pooling funds for the insured men at age k in year t.

3 Long-term balance between income and expenditure model

In the study of a long-term balance between income and expenditure of China's urban employee's basic medical insurance funds, this article mainly uses and focuses are on the balance of pooling funds, including the current balance of the pooling funds and the accumulated balance of the pooling funds. In year t, the current balance of urban employee's basic medical insurance funds is as follows:

$$RC(t) = CI(t) - TE(t) \quad (15)$$

As a reference to life insurance actuarial and pension pooling funds, the accumulated balance of urban employee's basic medical insurance funds is invested in the following ways: The accumulated balance is deposited as one-year fixed deposits and is **accumulated annually**. Therefore, this article uses the one-year fixed deposit interest rate to calculate the long-term balance between income and expenditure model. So the accumulated balance of the pooling funds per annum equals to the sum of the current fund balance of the pooling funds and the accumulated balance (including interest) of the pooling funds in the previous year. The accumulated balance of urban employee's basic medical insurance funds in year t is:

$$TRC(t) = TRC(t-1) * (1+I) + RC(t) \quad (16)$$

In the above formula, I represents one-year fixed deposit interest rate.

Parameter processing of the unified planning account forecasting model

Assuming that the demographic structure of the population participating in urban employee's basic medical insurance is consistent with the demographic structure of the population in China, and the coverage population of the insurance is all more than 20 years old. Male working age is 20-60 years old, female working age is 20-50 years old. According to the actual data obtained, select "Calculate by using the proportion of urban population" approach to estimate the total number of insured people[5]. Assuming that the proportion of China's urban population grows uniformly between 2014 and 2050, that is, linear growth, and there will be no change after the proportion reaching 76%[6]. Assuming that the coverage rate of urban employee's basic medical insurance system remains unchanged, that is, maintaining the coverage rate of 37.77% in 2014. The 1-year treasury yield rate of 2.35% on the first working day of 2016 is selected as the annual interest rate of the accumulated balance. Assuming the average wage of workers in the whole country as a contribution base. Assuming the basic medical insurance premium rate, **the pooling funds ratio** and the contribution rate in all cities and areas of the country are the same. Assuming that the employees who participate the urban employee's basic

[5]Refer to the estimation method of insured people in the book "Social Insurance Actuarial Analysis Model Operation Manual" published by China Labour and Social Security Publishing House.

[6]According to the "2014 World Urbanization Prospects" issued by the United Nations, China's urban population proportion in 2050 will increase to 76%.

medical insurance pay the premium, and the retired workers do not pay. The actual premium rate of the urban employee' basic medical insurance pooling funds is equal to the product of the basic medical insurance premium rate, the pooling funds ratio and the contribution rate.

Fit the monthly per-capita expenditure of the pooling funds for both male and female. The fitted regressions are as follows:

$$\ln mc_{t,k}^{ZF} = 0.068516k - 0.433476$$
$$\ln mc_{t,k}^{ZM} = 0.077611k - 0.101829 \quad (17)$$

Forecasting results of the pooling funds balance under different fertility policies

When studying the impact of the fertility policy on the balance of the pooling funds, the impact of the rapid growth of medical expenses, the slowdown of average wage growth rate and medical reform on the balance of the pooling fund need to be excluded[7]. In the long run, under the background of the declining GDP growth rate, the average wage growth rate in China cannot be maintained at a relatively high level for a long time. This article selects 5% as the average wage growth rate of employees. The income elasticity of medical expenses was 0.48 after excluding the factors such as government investment in health care, population structure, and urbanization. Therefore, choose 2.4% as the average growth rate of medical expenses (Blomqvist et al., 2014). 2015-2060 income and expenditure forecast data of China's urban employee's basic medical insurance funds is shown in Figure 4.

It can be seen that from 2015 to 2033, total income, total expenditure, current and accumulated balance are all equal before and after the opening of fertility policy. This shows that the change of the fertility policy did not have any impact on the income and expenditure of the pooling fund from 2015 to 2033. In other words, the change of the fertility policy will not have any impact on the income and expenditure of China's urban employee's basic medical insurance funds in the short term. It is consistent with the analysis of the fertility policy impact mechanism in this article.

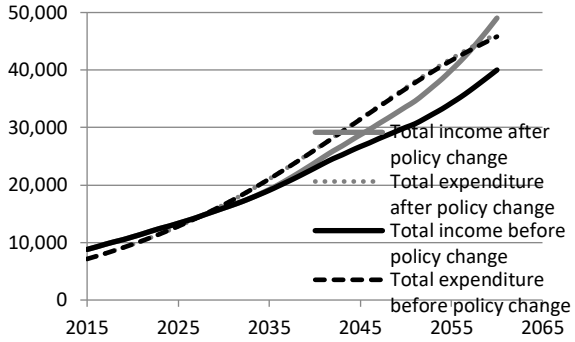

Figure 3 The pooling fund expenditure forecast (Unit: 100 million yuan)

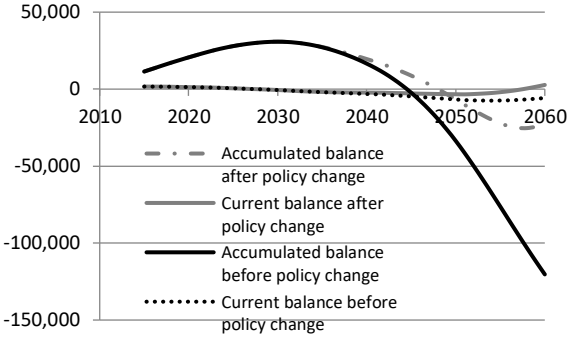

Figure 4 The accumulated balance forecast of the pooling fund (Unit: 100 million yuan)

Due to the impact of the population aging, the current balance of the pooling fund has been on a downward trend since 2015. The current balance after the opening of the fertility policy will **rebalance** earlier than that before the policy opening. At the same time, the fertility policy will also delay the downward trend of the accumulated balance. The appropriation of the government to the pooling fund will also be postponed. Therefore, the opening of the fertility policy will obviously ease the pressure on the current balance and accumulated balance of the pooling fund caused by the population aging issue in the long run.

The Scenario Analysis of the balance of income and expenditure of the pooling fund under the new fertility policy

The factors that have a great impact on the income and expenditure of the pooling fund are the average rate, growth rate of urban employees, and the medical expenses growth rate of urban employees, respectively. According to the data from National Bureau of Statistics of China, the growth rate of average wages for urban employees in 2014 was 9.49%, and the growth rate of per capita medical expenses for urban employees was 11.40%. At present, the speed of economic development in China is gradually slowing down. The average wage of urban employees will not be able to maintain a rapid growth rate at all times and will inevitably show a downward trend. This article assumes that the average wage growth rate will decrease by 0.25% per year and will not decline any further after the

[7]According to the statistics released by the National Bureau of Statistics from 2007 to 2015, with the slowdown of China's economic development, the average wage growth rate of employees has shown a downward trend.

decline to 5%. In addition, according to the trend assumption of the per capita medical expenses growth rate, this article predicts that the growth rate of per capita medical expenses will decrease, and will not decline any further after the decline to 6%. The reasons are as follows: First, China's medical reform has been implemented for six years by the end of 2015 and has achieved initial success. In the "13th Five-Year Plan", it has become a key issue and which implies that the growth rate of the medical expenses in China will slow down. Second, the medical expenses of China's urban employee's basic medical insurance are mainly reimbursed by means of reimbursement, and there are many tools for controlling medical expenses, such as starting line and reimbursement ratio. So relative to the overall medical expenses, medical insurance is more controllable. However, the decline rate of per capita medical expenses growth rate of medical insurance has a greater impact on the overall income and expenditure of the pooling fund. This article predicts the income and expenditure of the fund under the three scenarios of decline rate.

1. When the medical reform is ineffective, the growth rate of per capita medical expenses for urban employee's basic medical insurance will drop by 0.25% per year and will not decline any further after the decline to 6%. The current balance of the fund has been rapidly reduced since 2015 and will become negative for the first time in 2019. And the deficit will be even more serious in the ensuing times. Accordingly, the accumulated balance of the fund will peak in 2019 and then decline, turning negative for the first time in 2024. After 2024, the pooling fund needs to be financed except for contributions and the accumulated balance in the previous year.
2. When the effect of the medical reform is normal, the growth rate of per capita medical expenses for urban employee's basic medical insurance will drop by 0.5% per year and will not decline any further after the decline to 6%. Between 2015 and 2025, the current balance of the fund will slowly decline and remain relatively stable.

However, there will be a deficit starting in 2020 and the situation will rapidly deteriorate after 2025. At the same time, the accumulated balance of the fund will remain relatively stable between 2015 and 2025 and then decline. Financial support other than contributions and the accumulated balance in the previous year will be required for the first time in 2030.

3. When the medical reform is effective, the growth rate of per capita medical expenses for urban employee's basic medical insurance will drop by 1% per year and will not decline any further after the decline to 6%. The current balance of the fund for 2015-2017 falls and the current balance for 2017-2021 goes up. The main reason is that the medical reform effectively controls the growth rate of per capita medical expenses, which is lower than the growth rate of per capita wage in 2017-2021. However, it will have a downward trend after reaching the peak in 2021, and the total revenue will be less than the total expenditure since 2028. Compared with the previous two scenarios, the accumulated balance of the fund is also significantly improved. It will increase from 2015 to 2028. However, the accumulated balance in 2037 will still completely be consumed, and government funding or other means of financial support will be required in the ensuing period.

Conclusion and policy recommendations

This article first predicts the population development in China under the new fertility policy and concludes that if the government does not change the fertility policy, China's total population will reach 1.39 billion in 2022, and then will be in a downward trend until it drops to 1.01 billion in 2060. After the government opens the fertility policy, the total population is expected to grow from 2010 to 2028, the total population will postpone six years to reach its peak of 1.43 billion. Then there will still be a long-term decline, but the decline rate will be significantly less than that before the opening of the fertility policy and the population will be at 1.21 billion by 2060. In addition, changes in the fertility policy have a greater impact on the demographic structure and will ease the trend of population aging in China.

Based on the population forecast results of different fertility policies, this article forecasts the income and expenditure of China's urban employee's basic medical insurance pooling funds and concludes that the changes in the fertility policies will not have any impact on the pooling funds in the short term. In the long term, the changes will reduce the pressure brought by the population aging on the stability of the pooling funds. This study established that population structure, wage growth rate and growth rate of per capita medical expenses have a great impact on the pooling funds. The population aging causes the decreasing number of people paying premiums and this has resulted the reduced total revenue. The result of the regression of the pooling funds per capita medical expends on age shows that the per capita medical expends have a positive correlation with age. Under the general trend of the increasing proportion of retirees, the expenditure of the pooling fund has been steadily rising. And the pooling funds balance is very sensitive to the wage growth rate and the per capita

medical expends growth rate of the pooling funds. According to the economic growth in China, assuming that under the declining per capita wage growth rate, the growth rate of medical expenses will decline at a slow, normal and relatively fast pace. In the three cases, the current balance of the pooling funds will become negative in 2018, 2019 and 2028, respectively. The accumulated balance will be completely consumed in 2024, 2030 and 2037, respectively, and need to be financed by national financial allocations and other means.

Through the study of the income and expenditure balance of urban employee's basic medical insurance, this article puts forward the following three suggestions:

1. The fertility policy can ease the impact of population aging on the balance of urban employee's basic medical insurance fund in the long run, but in the short term, the fertility policy will not have any impact, the government needs to control the balance of funds as soon as possible by other means.
2. In terms of the pooling funds income, the government needs to increase the number of people paying premiums in the short term, so that it can help reduce the burden on employees' contributions. Under the policy of non-payment of retirees, as the proportion of employees' declines, the pooling fund income will decrease. If the government increases the premium rate, it will inevitably increase the burden on employees. And because the entire social security will be in a unified trend, the rise of the premium rate is limited. In the short term, the government can increase the number of people paying premiums by retirement delaying, premiums sharing between retirees and the minimum payment period. And the long-term fertility policy will ease the declining incomes.
3. In terms of the pooling funds expenditure, in the short term, the government should make an effort to promote the medical reform process, rapidly control the growth of medical expenses. And it should also control the relationship between the growth rate of medical expenses and the wage growth rate over the long term. According to the results of three scenarios of medical expense growth rate in this article, in the short run, rapidly reducing the growth rate of medical expenses can effectively control the short-term balance of the pooling funds. In the long run, the relationship between the wage growth rate and the growth rate of medical expenses is the key factor for the pooling fund income.

This article still can be ameliorated for the purposes of further research. To start with, the article could not get enough information about the detailed data of medical insurance and just assumes that the population structure of urban employee's basic medical insurance is consistent with the population structure of the people above the working age in China. Furthermore, due to the fact that the medical expenditure data in China is not perfect at present, this article did not study the impact of the starting line and the payment limit on the urban employee's basic medical insurance expenditure. With the improvement of social basic medical insurance database, a more accurate actuarial model could be established for the income and expenditure of urban employee's basic medical insurance funds, so that we can predict the development trend of medical insurance. And based on the forecast results, relevant measures can be taken promptly in order to better maintain the stability of urban employee's basic medical insurance. In addition, the stochastic model can be applied to the prediction of urban employee's basic medical insurance. And the risk range of income and expenditure can be predicted by Monte Carlo simulation to better reflect the risks faced by the pooling funds.

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Rehabilitation Services as a Major Function of Social Work in Medicine

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Abstract

The article explores how a major responsibility of social work in the changing society of the current time is to lead the clients towards rehabilitation. The present time is witnessing increasing problems within families, youth, working people, the unemployed, men and women. Many of such people with lost norms and values need to be rehabilitated somehow or the other to again become efficient and functional. The paper pursues how social work is to restore balance in an individual's personal, family and social life. Through such a rehabilitation process, the person recovers his/ her health, habits and way of life to adapt and reintegrate into society and functional, physical and recreational therapy etc. Therefore, the outcome of rehabilitation services is to activate social work functions. The hypothesis used in the present research is: *Quality social work improves the quality of life of the clients*.
Keywords: Rehabilitation. Social work. Social life. Norms & values. Quality of life.

Scope of the Issue

The research explores how the ever changing societies of the modern times need to extend their social services to be applied through social work strategies. As people's lives, standards and expectations are ever changing and promoting, there need to be modern and progressive means and services to meet the emerging needs of the people with problems of deficiencies. Similarly, to promote social justice, among the various groups and individuals, social services need to be upgraded and developed in terms of time and place. In this research, the term social work in particular refers to the professional practice of delivering certain social services. Likewise, the scientific study of physical sciences, social sciences, and the requisite technology to the goals of performing social work practice in order to improve the human well-being. Similarly, children's and young people's emotions in professional practice are taken into account in policy and practice (Kraftl, 2015).

Though many social work systems evolved over the 20th century, yet they further need to be evolved in the 21st century. While the population of the developing world has increased many folds in the past 60 years, social services have not changed at the same rate with population change. The paper sociologically weighs and assesses the emerging conditions. The paper mainly appraises the state of social work services in Iran, where more investments are needed to be put into effect. As far as Iran is concerned, there is yet a large gap between supply and demand in terms of social work services. Not only in Iran, but in other developing countries more resources need to be created and mobilized in order to respond the emerging welfare needs of various classes of individuals with special reference to the lower-class people.

Introduction

Social work such as a new profession has found its identity in the post-industrial revolution era. It has developed in parallel with industrialization and urbanization of societies with special reference to the Western world. Social work such as nursing seeks to diagnose and treat the response to the problems. Social workers quite similar to nurses are guided by an ethical and humanitarian philosophy in which every human being deserves respect, regardless of social, cultural, racial, economic, religious or other factors. Social workers as social nurses practice in the context of relations with the clients, families, or groups. In principle, social work services are given to people at all stages of life in the home, hospital, place of employment, school, or any environment where social work is needed. However, the progress or lack of progress towards the goal is determined by the

client and the social worker, or so to say social nurse. Therefore, social work/social nursing is protective and preventive, and can lead the individuals to have healthy lives.

Research Methodology

Research is defined is the application of the scientific method in the study of problems. At moments, the terms research and scientific method are used interchangeably. In the present work, the research is based on a combination of theoretical frameworks and empirical realities. For the empirical part of the study 343 social workers out of about500 stationed in welfare departments and hospitals were randomly selected from different parts and neighborhoods of Tehran City. They were approached through direct interviews with the help of pre-designed questionnaires. Eventually, the filled-in questionnaires were edited, and electronically extracted to reach the findings. The author also reviewed the background literature on social work service from different societies of the world. The present research is based on the main hypothesis that: *"Quality social work improves the quality of life of the clients"*. In the theoretical part, the author tried to refer to, and make use of relevant theories within reach. Similarly, in the empirical section the data collected were processed, and the results of which are presented as findings. The data presentation is almost descriptive; reflecting the dimensions and qualities of social work in Tehran which is generalizable to Iran as a whole. The theme of the research being the first of its kind, could be interesting to those keen about social work in Iran. It also would add to social work literature in Iran which is not rich enough.

Social Work Global Perspective

Social work is a profession for those with strong desire to help improve people's lives in different ways. Social work is a professional discipline pursuing development and promotion of social welfare (Ghandi, 2009:55). Similarly, social work has been defined as being concerned with the interactions between people and their environment which affect the ability of people to accomplish life tasks, alleviate distress and realize their aspirations and values, and the quality of which must ever be improving (Pincus and Minaham, 1973:9). Social workers assist people how to cope with and solve issues in their everyday lives, such as family and personal problems and dealing with relationships. Social workers establish a helping relationship with a client system (individual, family, small group, community), using their assessment skills and knowledge of helping resources to identify alternatives that may improve a situation. In this way, the author tries to prove the hypothesis. They may also conduct research, advocate for improved services, or become involved in planning or policy development. They provide social services and assistance to improve the social and psychological functioning of children, families, the elderly people, lonely widows etc. Similarly, in schools, social workers often serve as the link between students' families and the school to ensure the academic success of the students. While in the developed countries there are types of social workers who are trained and made ready to serve in specialized fields, the shortage of such professionals is easily felt in the developing countries such as Iran. Similarly, while employment of more social workers is expected in the West due to the growing ageing population, and the ageing baby-boom generation, developing countries such as Iran lack it due to limited resources.

Social workers are found in a wide range of settings such as family centers, schools, mental health centers, social welfare departments etc. in the developed countries. In the developed countries some are self-employed; preferring to set up their own private practice in a manner similar to many physicians and lawyers. They usually work with all kinds of people including the poor, substance abusers, minority groups etc. While the developed countries are very experienced in the field, the developing countries including Iran still have a long way to go to be able to cope with their social work and social welfare needs in their societies.

Social Work vs Growing Needs

As the human needs are ever increasing due to social, industrial and cultural change within the individuals and communities, social work services must expand in parallel as well. The concept of common human needs and social welfare as articulated by Towle (1965) includes those basic common needs which are necessary for the survival and development of all human beings. According to Towle those include physical well-being, personality development, emotional growth, development of intellectual capacity, relationship with others, and spiritual needs which are highly concerned with the functions of social work. It is worth mentioning that early social work was characterized by two

streams of activity: social reforms and direct assistance to individuals and families. In case of Iran, more social reform is accomplished rather than direct assistance to clients.

Due to the specific circumstances, human needs may increase or decrease. Helen Harris Perlman (1957:31), a social worker like Towle, emphasized the holistic nature of common human needs as such: “The person is a whole in any moment of his/her living. He/she operates as a physical, psychological and social entity, whether on the problem of his/her neurotic anxieties, or of one’s inadequate income”. He/she is highly affected by his/her physical and social environment. Therefore, it is the social work which can intervene and solve the person’s problems.

While all people seek to meet their needs for growth, development and survival, the way they do so varies. Common needs are expressed and met in different ways by different groups of people (Berger: 1985). Human diversity refers to the biological, psychological, social and cultural differences as observed among different people. However, some of the most significant types of diversity are gender, age, race, ethnicity, physical or mental ability, socio-economic level etc. All these create functions for social workers.

Social Work Profession in Tehran

Social work as an academic and professional discipline always attempts to improve quality of life and increase well being of citizens, families and communications through various professional ways. The present research examines the nature of social work, and the role and function of social workers in Tehran mega-city. It explores and identifies the skills, knowledge and expertise as acquired by social workers in this city. While the society has undergone much changes in the second half of the 20th century; followed by changes in the family system, social institutions, culture etc., the paper will measure the quality and functioning of social work as reflected by the social workers in Tehran. Though social workers are more to do with the regulation and monitoring of professional activity” (Banks, 2003), yet it is increasingly emphasized on the core values on which social work as an activity should be based on. Social work as proposed by IFSW contains reference to human rights, and social justice (IFSW,2004). Social work is a necessity today, and it should be meaningfully practiced to have a high turnover rate. Social work is practiced in order to alleviate crises (Jones et al.,2004). Similarly, “the idea of the social worker as someone who works with or counsels individuals has been a recurrent and powerful notion in social work throughout its history (Younghusbands, 1959).

Social work being a board profession, it exerts its activities in fields such as health, mental health, social services administration, families, social justice etc. Though there are constancies in terms of the assumed function of social work and the role of the social workers, it is nevertheless important to understand the socio-economic context in which they are situated. Understanding the socio-political factors which have influenced the development of social work or social services across Europe is necessary to know (Evers, 2003; Munday, 2003). Developing countries including Iran as well could follow suit. Therefore, social work does not operate in a vacuum. There are a number of contextual factors to be acknowledged in our understanding of the role to be played by social work and social workers. To further clarify the matter, Iran needs to employ relevant social action and social planning in order to improve its social work activities. However, many developing countries including Iran need to develop relationship- building, interviewing, community assessment, decision-making and task planning in social work (Hardina, 2012).

Social workers can actively be engaged in helping others to help themselves. The function of social work and the role played by the social worker in the contemporary society has of course been influenced by major social changes which have occurred over the past two-three decades. Major demographic change such as the increasing low birth rate in Iran, and as a result, a move to a much older age structure, has changed the functioning of social work not only in Iran, but to some extent in other developing countries as well. As Munday (2003) points out, the significance of low birth rate means that in the future there will be a shortage of adult children to look after elderly relatives; the phenomenon which is almost appearing in Iran. This will have an obvious impact on the provision of not only social work, but further provision of social services. The rise in drug-related problems, youth-related problems, elderly problems and the like; all need social work interventions.

Similarly, the appearance of increasing poverty and social exclusion in different forms as some commentators argue (Jordan and Parkinson: 2001; Unison, 2004; Jones et al., 2004) need to be tackled through social work interventions. However, the operation and use of social work would prevent individuals, families and the communities that are at risk. In the meantime, the identity crisis of social workers in a local authority setting are no longer able to effectively carry out preventive work

is there (Jordan and Parkinson:2001:217 ; Jones, 2004). Therefore, there is yet a lot to be done to familiarize the roles and functions to the social workers with special reference to countries like Iran.

A Cross-cultural Focus

Compared with the South Korean state of social work practice, Iran has still a long way to go to improve its social work practice. As far as Iran is concerned, much remains to be done both to increase its focus on intervention research, and to unravel the complexity of practice issues across the country. Over the past 20 years, the South Korean government has expanded its expenditure on social welfare from 2.90 percent in 1986 to 6.66 percent of the total annual government budget in 2006 (Choi et al.,2009). In addition, South Korea has at present a national pension, national health insurance, workers' compensation insurance, unemployment insurance, and long-term care insurance. The five social insurance systems are major components of the South Korean welfare state.

What Iran has to do is to improve its potentialities and focus on:

- Social security
- Family and child welfare services
- Medical social services
- Services for people with disabilities
- Services for elders
- Services for young people
- Services for offenders

In Iran though annually over 300 thousand students are graduated from public and private universities, yet they are not well distributed and accommodated according to their expertise (Shargh Newspaper, 2006). Such a situation resulted in shortage of social work practice in the country as compared with South Korea. In Iran, municipality department has the potential to handle and steer the social work practice through its prepared and educated human power. At the time being, municipality is running new institutions called *"health houses"* in all the 22 districts of Tehran City. These health houses deal with the social needs of the elderly people, disable children, other vulnerable people, environmental issues etc.

However, both Iran and South Korea have almost common social issues such as unemployment, digital gap, immigrant labour, poverty, financial instability, national pension system, caring for refugees, public health, family problems and so on, of which some are related to Iran and some are common for both. South Korea that started investing in social work timely, currently faces fewer social problems, whereas Iran is yet to invest in social work practice and other related social services to solve the emerging problems of different kinds.

While in 2015, South Korea stood at the state of purchasing power per capita of US $34620, Iran was placed at purchasing power per capita position of US $ 16080 (WPDS,2015). So, the country (Iran), has to endeavor and be more active in all dimensions including social work and problem-solving strategies.

Validity

The value of social work is generally associated with; working with individuals, face to face work, working with communities and community work, prevention and the like. In addressing developments in social work in countries like USA, Australia and New Zealand, Patron and O'Byrne (2000) outline the notion of constructive social work. Within the notion of value-based social work, various concerns related to the crisis in social work are reviewed and underpinned. Account for problem-solving situations are found through dialogue with the worker and joint efforts are made to negotiate the financial and human resources needed to effect meaningful life changes.

To solve social problems and alleviate or weaken social crises, social work and social workers are very much needed in order to fulfill the function and role of supporting those who are in need; largely because of poverty, disadvantage and social exclusion. However, without the role being played by social work, large sections of the population would have little protection from the negation impact of the growing social and economic inequalities which will continue to characterize life for many individuals, the elderly, families and communities in the 21st century.

The ultimate goal for nursing and social work leaders is to develop skills that will support their ability to lead effectively through complex challenges such as working within the constraints of tight budget, initiating health care policy change to eliminate health disparities, and improving health care outcomes at all levels of care (Marshall, 2010). Based on this perspective, Iran also has initiated its

Family Doctor Plan (FDP) ; through which family members and households will be covered by designated health and medical practitioners.

Professional identity of social work is needed to be established in order to reflect clear roles of the social workers. The identity of social work and the role to be played by the social workers has to be viewed in reference to the changing nature of the relationship between social worker and client (users). Similarly, social work is a confusing term and contributes to the lack of clarity between social work, social care, social services, social the critical situation in which social work finds itself. However, social workers confront various cases/problems during their professional careers. Those may include hunger, shortage of affection, problems of habitation, marriage-related issues, infertility-related issues, income/occupation problems and the like (Montakhab,1992:31).

Responsibility of Social Worker

Social workers must uphold public trust and confidence in social work services, and whose primary role is to protect and provide the welfare and well-being of the children, youth, the vulnerable adults and communities. Social workers reserve certain functions, and should act in terms of regulations, in a way to ensure the protection of the public. Social workers should have access to professional consultation, support and advice from appropriate, experienced and higher social workers. The intended consultation and management should focus on assisting social workers to reflect critically on their practice, use their powers effectively and make complex decisions. Similarly, social workers constantly manage the double roles of care and control in discharging their duties in a varied and complex environment. It is important that the service users and the general public understand the complexity of balancing the two roles. There must also be collaboration, transparency and openness with clients particularly in association with using statutory powers.

Social workers must be aware of society's values and operate in accordance with the legal obligations. They must be able to balance the needs of the clients/ service users. As communities always include people who are vulnerable and who pose challenges for themselves and others, social workers intervene in situations where not to do so, could lead to a continuation or escalation of harm. They may even work with people who have no wish to use social work services. On the other hand, social workers may be involved in cases where a wide-range of resources may be needed. However, they have a role to play in promoting social justice, and in identifying and addressing obstacles to social inclusion.

Social work skills are often deployed to good effect in collaboration with other professionals, either in on-going multi-disciplinary terms, or in ad hoc joint work around the needs of an individual or family. The distinctive social work contribution combines a developing body of knowledge and skills; a set of core values and priorities, and a range of personal qualities, and it includes working through the medium of a qualitative personal relationship. It is worth mentioning that though the primary responsibility of the social worker is the protection and promotion of the welfare and well-being of children, vulnerable adults, the elderly, and communities, yet in a wide-range of developing countries it does not happen so. Social workers should use their professional knowledge and expertise to make due judgments and decisions to solve problems.

To improve the quality of social work, the link between sociology and social work must be strengthened. There can be little doubt, however, regarding the importance of sociological theory and research for the development of the knowledge and theoretical base of social work practice. For example, social stratification, conflict theory, deviance, community development and dynamics, family studies, of the areas are some of the sociological theories/perspectives that have informed and directly influenced both the theory and the practice of social work (Meyer and Borgatta,2012).

Social workers are likely to work with people who have no wish to engage with social work services, but at the same time are required to do so for their own interests, or others' interests/safety. This will bring a positive change in their lives. Similarly, social workers are needed to have appropriate access to technical and professional consultations; get the necessary support and advice from experienced social workers in order to effectively make complex decisions.

Social workers are therefore responsible for the assessment and management of complex and inter-connecting risks rather than simply risk avoidance. This needs social workers to work with individuals to help them assess the risk they face, and may present to others, and to promote the independence of service users while helping them as far as possible from danger of harm. Similarly, social workers need to be able to develop and maintain their skills in this field throughout their careers, and in all settings. Therefore, the social worker's task is to work alongside the people to help them build resilience, maintain hope and optimism and develop their strengths and abilities. They must detach uncertainty from the approaching clients.

Social Work as Profession

Social work is a profession for those with a strong desire to help improve people's lives. The functions of social workers is to assist people by helping them cope with issues in their everyday lives, deal with their relationships, and solve personal and family problems. Some social workers help clients who face a disability, such as a life-threatening disease, or a social problem such as inadequate housing, unemployment and the like.However, many social workers specialize in serving a particular population or working in a specific setting. Yet, some who conduct research and advocate for improved services, are involved in planning or policy development.

As far as the work environment is concerned, social workers usually spend most of their working time in an office, they may travel locally to visit clients, meet with service providers, or attend meetings. Social work, while satisfying, can be challenging too. For example, understaffing arrangements and caseloads may add to the pressure, and ultimately affect social workers.

Problem-solving

Social work is an art, a science, or a profession that helps people solve personal, group (especially family), and community problems, and to attain satisfying personal, group and community relationships through social work practice (Farley and Smith,2007:9). Social work promotes social change, problem solving in human relationships, and the empowerment and liberation of people to enhance well-being. Social work utilizes theories of human behavior and social systems. It contributes to the points where people interact with their environments. However, principles of human rights and social justice are fundamental to social work (International Association of Schools of Social Work, 2001).

Development vs Social Work

While development is a complex concept both in theory and practice, it is very much associated with social work. At the individual level, development has the implications of increased skill and capacity, freedom, creativity, self-discipline, responsibility and material well-being. Similarly, at the level of society, the concept connotes increasing capacity to regulate internal as well as external relations (Rodney, 1972). Other scientists relate it much to gross national product (GNP). Thus, any nation may be said to be achieving some level of development, if its per capita output is growing faster than its population (Todaro and Smith, 2003). Economic development has further been seen in terms of the planned alteration of the structure of production and employment, and the whole process is very much subject to the application of social work.

Additionally, Stutz and De Sousa (1998:543) note that the United Nations has devised a Human Development Index (HDI) to measure national human development of both developing and developed countries. The HDI comprises of demographic, social and economic factors such as life expectancy, literacy rate and per capita purchasing power, respectively. The improvement of all these indicators are very much concerned with the operation of the role and function of social work.

In a nutshell, development is both material and social; material in terms of economic growth and increased productivity, and social in terms of qualitative changes in people's lives, attitudes, institutions and external relationships. In this process, social work helps the individuals identify themselves as community, and are collectively empowered to use the necessary knowledge, values and organizational skills to sustainably share and enhance the available resources in order to bring about positive change in favour of all members of the society. Thus, through the application of social work, while different dimensions of development are achieved, poverty, inequalities, sufferings and injustice are aimed to end (Oxford Community Aid Abroad, 2001).

Not only in Iran, but all nations need both social and economic resources to achieve national development. In this regard, social work can generally contribute to the process of development through enabling individuals and the society. Thus, social workers are mandated to mobilize and deliver a wide range of services to their clients (Bernstein, 1995:54).

Theoretical Perspectives

Social work needs to express and articulate the theoretical frameworks which inform, structure and facilitate its operation (Coulshed and Orme, 1993). Social work discussions about theory have tended to be reactive. Similarly, theories in social work often include approaches such as

person-centered counseling, family therapy, cognitive-behavioral therapy, anti-discriminatory practice theory etc. (Davies, 1997). Another perspective is expressed as such; traditionally in social work as in other social policy areas, the social work profession tends to be interpreter of such knowledge at theoretical as well as practice levels. In social work, a distinct area of research developed which came to be called “client studies”, pioneered by the book “The Client Speaks” (Meyer and Timms, 1970).

Historically speaking, the knowledge base of social work has been derived from social research conducted using traditional methods of inquiry which claim to be objective, neutral and value free, and to produce knowledge which is independent of the persons carrying out the research (Stanley and Wise,1993).

Whether we recognize it or not, theory- less practice does not exist; we cannot avoid looking for explanations to guide our actions. Therefore, to make sense of our everyday experiences, so that we can explain to ourselves and to others what we are doing and why, we have to turn to theory. Research has shown that agencies which profess not to use theory, offer a non-problem- solving, drifting service (Corby, 1982:6).

There seems to be no bounds to the knowledge and skills required to do social work, despite the claim that, “anyone with a kind heart can do it” (Olsen, 1986). The list of our roles and tasks continues to grow: practitioners have to be therapists, managers, reformers, researchers, planners, teachers and protectors. Though we cannot be experts at everything, yet, as we have seen, we are beginning to be expected to understand the cause and cure for many social ills and prove that our methods work. Personal qualities such as self-understandings, curiosity, determination, and ability to get along with people are necessary, but not sufficient conditions for productive practice (Jordan, 1984). We need a kind heart, common sense and uncommon sense (Gammack, 1982).

However, the construction of social work theory is based on what social workers do. It emerges from expectations taken up from that society. In particular, people form or construct social work and its agencies by their demands and expectations, and therefore, social workers and their agencies are influenced to change by their experiences with the people they serve. Clients and their experiences are the realities that social work has to deal with; they make social work what it is. Workers, clients and agencies contribute to some extent to any society's expectations and its political and social process by their own thinking and doing (Payane,2005).

Findings

In conducting research on social work tasks in Tehran City, some 343 social workers were approached. The data collected from the interviews indicate an image of social work in Iran.

Age	Total		Males		Females	
	Number	Percent	Number	Percent	Number	Percent
Total	343	100	89	25.95	254	74.05
Under the age 25	13	3.79	4	1.17	9	2.62
Age 25- 29	88	25.66	7	2.04	81	23.62
Age 30-34	79	23.03	19	5.54	60	17.49
Age 35-39	68	19.83	19	5.54	49	14.29
Age 40-44	45	13.12	18	5.25	27	7.87
Age 45 and over	50	14.58	22	6.41	28	8.16

Table 1: Classification of Social Workers by Age and Sex in Tehran City

Based on data collected, and according to the educational standards of the social workers, out of 343 social workers interviewed, 6 (1.75%) had finished higher secondary school, 36 (10.5%) has finished diploma, 229 (66.76%) had finished BA, and finally 72 (20.99%) of the social workers had finished their MA degrees or above.

Data collected indicate that out of the total sum of 343 respondents, 244 (71.14%) of the social workers had official and specialized certificates of social work, while 99 (28.86%) did not have official certificates for their jobs. Based on gender classification, 56 (16.33%) of male social workers reported to have official and specialized certificates, and 33(9.62%) did not have any official and specialized certificates. So far as the female social workers are concerned, 188 (54.81%) asserted to have specialized social work certificates, whereas 66 (19.24%) of whom did not have the same.

The social workers studied could be classified affiliation-wise. Out of the total 343 respondents, 159 (46.36%) were affiliated to the welfare department, 63 (18.37%) were affiliated to Imam Khomeini support committee, 68 (19.83%) were connected to the ministry of health, and finally 53 (15.45%) were affiliated to private sector.

In one of the questions asked, the author came to know of the number of clients that the social workers visit per month. In that, 69 (20.12%) asserted to have less than ten clients per month, and 73 (21.28%) of the respondents stated to have 10 to 14 clients per month. Similarly, 68 (19.83%) of the sample social workers stated to have between 15 and 24 clients in an month, and eventually, 133 (38.78%) of the social workers asserted to have more than 25 clients monthly.

In another question the views of the social workers were searched as to which sex clients they approach per month. In response to this question: Out of the total of 343 respondents, 123 (35.86%) asserted to get more female referrals, 48 (13.99%) stated to get more male clients, and finally, 172 (50.15%) stated to have both male and female clients in equal numbers.

Social workers were also searched with reference to the type of problems raised by clients. In that, 54 (15.74%) stated that their clients had substance abuse problems, 136 (39.65%) of the given social workers stated that their clients had family problems, 73 (21.28%) of the respondents asserted that their clients were somehow ill, 64 (18.66%) of the samples expressed that their clients did not have regular income, and finally 16 (4.66%) of the clients declared that their clients had other difficulties.

Social workers were also investigated with regard to the type/quality of the illness of the clients in Tehran City. In that, 55 (16.03%) of the sample respondents declared that their clients had physical problems, 55 (16.03%) declared that the clients were involved with some physical and mental problems, 227 (66.17%) of the social workers had clients with dementia and Alzheimer's disease.

In the present research, social workers have been classified according to the age groups of their clients as well. In that, the respondents asserted that 35(10.2%) of their clients were in age groups 15-24, similarly, 136 (39.65%) of the samples stated that the approximate age groups of their clients were between 25 and 34 years. 125 (36-44%) of social workers categorized their clients between 35 and 44 years of age, 30 (8.75%) of the sample respondents declared their clients' age-groups between 45 and 54. Finally, 17 (4.96%) of the social workers stated that their clients were of 55 years of age and over.

One of the other assessments as conducted on social workers is their study in terms of the insurance status of their referrals. In this part, 187 (54.52%) of the respondents asserted that most of their clients have health insurance, whereas 156 (45.48%) of samples stated that mostly their clients do not have health insurance.

Similarly, social workers were measured by number of times that clients refer to their social workers. In that, 19 (5.54%) of the sample social workers stated that the hold one sessions with their clients, 74 (21.57%) of the social workers asserted that they hold two sessions with their clients, 103 (30.03%) of the respondents declared that they hold three sessions with their clients, and finally, 147 (42.86%) of social workers stated to have four sessions and over with their clients.

Here we will come to know of the duration of problem-solving of the clients by the relevant social workers. In that, 59 (17.2%) of social workers enunciated that it took them less than one month to treat their clients. Similarly, 114 (33.24%) of social workers stated that it took them 1 to 3 months to rehabilitate their clients followed by 99 (28.86%) of respondents who stated that they rehabilitate their clients between 3 to 6 months, and eventually 71 (20.7%) of the samples declared that they finish up with their clients within 6 months and above.

Post-treatment relationship between social workers and clients is noteworthy. Out of 343 respondents, 94 (27.41%) of social workers stated that they had no relations with the clients at all after their treatment, 92 (26.82%) of social workers stated that they kept contacts with clients for less than one month after their remedy, 58 (16.91%) of the respondents enunciated that they kept contacts with other clients for 1 to 3 months. Likewise, 38 (11.08%) of the sample social workers reported to be in contacts with their clients in the post-treatment period for 3 to 6 months, and finally 61 (17.78%) of the social workers asserted to be in contacts with their clients after their files are closed for 6 months and over.

In another question, the quality and place of social case work is searched. In that, 22 (6.41%) of the social workers reported that they treat the clients more at the elderly nursing homes, 140 (40.82%) of the social workers asserted to treat the clients at the scene/site, 56 (16.33%) of the respondents stated to interact the clients at their homes, and eventually 125 (36.44%) of social workers declared to treat the clients at the rehabilitation centers.

As the relation of social workers with young couples as clients is of importance, some questions were developed in this regard. In that, 37 (10.79%) of social workers reported to be very much in relation with young couples as clients, 64 (18.66%) of social workers stated to be much in relation with young couples as clients, 160 (46.65%) of the respondents reported to be in relation with young couples as clients to some extent, and finally 82 (23.91%) of social workers expressed to be very little in relation with young couples as their clients.

As divorce rate is currently quite high within the youth in Iran, some relevant inquiries were made in the present study as the objectives of the social workers' relation with young clients. In this connection, 51 (14.87%) of the social workers aimed to nullify the divorce intention of the clients, 111 (32.36%) of the social workers asserted to delay the divorce case of their young clients, 4 (1.17%) of the social workers preferred accelerating the divorce case of their young clients, and finally 177 (51.6%) of the social workers preferred and chose compromise within their young clients.

As many social workers are involved with elderly clients today, some questions have been set here to clarify their conditions. In this regard, 170 (49.56%) of the social workers said to be involved with lonely female clients, 38 (11.08%) of the social workers stated to be involved with lonely male clients, and finally, 135 (39.36%) of social workers expressed to be involved both with male- and –female- alive clients.

The paper has also investigated about the type of clients approached. In this regard, 59 (17.2%) of the social workers declared their clients to be elderly people, 17 (4.96%) of the social workers declared children to be their clients, 49 (14.29%) of the social workers declared young criminals to be their clients, and finally 218 (63.56%) of the respondents stated families to be their clients.

Conclusion

Social work services if improved, could highly boost the quality of life of all sorts of people with special reference to the ageing people. The paper gives us an insight to develop social work practice in Iran, wherein ageing people are increasing under the conditions that overall social, economic and cultural life is also changing. In order to enhance the quality of service on social work, we should ensure as to where the society is. Similarly, the existing services must be assessed, and further developments should be planned for. While the human needs are increasing more than ever before, social work services are necessary in all kinds and for all sorts of people regardless of age, sex, religion, race, caste and creed. While the holistic nature of common human needs such as the physical, psychological and social ones is the same, for those with organized social work services, they are responded, but for many including potential clients in Iran with underdeveloped social work services, they are not met. Under such circumstances many problems remain unsolved for such people in developing societies including Iran.

The paper enunciates how social work services are associated with a number of contextual factors which need to be acknowledged, before it is practiced. Similarly, due to the appearance of increasing change in social life, family life and social exclusion in Tehran (Iran), enhancing the quality of social work, and the quantity of social workers is remarkable. In this way, social workers can detach uncertainty from the approaching clients. In the present study findings have examined various indicators as expressed by the social workers such as age, sex, education etc. Similarly, data associated with various indicators of clients such as the difficulties, number of referrals, age, sex, characteristics of the clients etc. were assessed and measured in detail.

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