Article

Study on the Health Status and Health Service Utilization for the Rural Elderly in the Metropolitan Suburb During the Urbanization Process: A Case for Mingxing Village, Guangzhou

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Abstract: Rapid urbanization development significantly accelerates residents’ income in China, but there still exists a series of problems in rural areas, especially the health status of the rural elderly in the metropolitan suburb, a crucial matter worthy of attention. Regarding the rural elderly in a suburb of Guangzhou as a research object, this paper focuses on comparison of the health status and health service utilization differences between the national and local rural area, and qualitatively analyze and explain it by the cumulative disadvantage theory during the life course. By random sampling in the study group, 122 seniors from Mingxing village in Guangzhou are selected for structured face-to-face interviews. Data analysis of questionnaires (collected by trained investigators) shows that, except for self-care ability, the elderly in the village exhibit more serious hearing, vision, movement disorder, daily activity, and pain problems than the national average. Regarding mental health, the proportion of anxiety and depression symptoms in Mingxing village is 21%, both over the national countryside average. The two-week prevalence, chronic disease prevalence, and inpatient out of hospital are 78%, 85%, and 53%, respectively, which are still higher than the 2013 national rural average. Research demonstrates that the elderly mainly choose village clinics for outpatient treatment, county hospitals for inpatient treatment. The two-week visiting rate is 33%, lower than that in 2013, and the hospitalization rate is 15%, close to 2013 level. In conclusion, the health status and health service utilization of the elderly in Mingxing village in Guangzhou is generally lower than the national average level. Daily living habits, traditional notions and willingness for medical treatment are indispensable factors in affecting the elderly health. Economic status, living environment and education level continue to be the main factors in influencing the health service utilization for the elderly in Mingxing village.

Keywords: rural elderly; health status; health service utilization; metropolitan suburb

1. Introduction

Among the measures of human welfare, health status is the most closely one related to the individual’s survival and life, and an important dimension in assessing social and national inequality. Since the end of the Second World War, overall human health has improved significantly. Meanwhile, health inequality gaps among different individuals, groups, regions and countries present a trend of
continuous expansion [1]. Since the reform and opening up in the 1970s, China’s rapid urbanization and economic development have had a substantial impact on the population health in rural areas [2]. The rapid outward expansion of the city center area promotes the urbanization process of rural suburbs. With the influx of immigrants, the more rural parts of the suburban areas have become small processing and industrial premises [3]. Rural industrialization provides direct economic and social benefits to local communities in a certain extent, and improves farmers’ socioeconomic status. However, on the contrary, the elderly in rural areas, who generally with less-education and lower-income, still hold large difference in the concept of receiving medical treatment compared with urban elderly [4]. Such as sick died, conservative treatment, high expense and difficulties in medical care are still thorny problems the rural elderly have to face [5]. Besides, due to a lack of mandatory environmental laws and regulations, rapid urbanization caused serious environmental problems in rural areas, such as air pollution [6], water pollution [7], high energy consumption, and noise pollution [8], etc. As industrial and urban pollution moves to the countryside, concerns are rising over the potential health risks of the rural population [9]. According to the latest data released by the state council, there are 600,000 administrative villages in china, where about 200,000 are industrial enterprise villages, and more than half of them exist environmental issues. By the end of 2017, there are 241 million people aged 60 and over in China, and 70% of them are rural elderly. Nearly 150 million elderly suffer from chronic diseases, about 40.63 millions are disabled or partially disabled [10], and the death rate from malignant tumors is 151 per 100,000 people in rural areas. Up to 63.2% of the rural elderly have poor living behaviors, where dietary risks (over-nutrition or malnutrition, smoking and drinking, etc.) and environmental issues (indoor and/or outdoor air pollution, noise pollution, etc.) are dangerous factors for non-communicable diseases such as chronic. Data from the world health organization show that about 24% of healthy living losses and 23% of excess mortality are attributable to environmental aspect [11]. Meanwhile, with the intensification of urbanization process in rural areas, population migration, specially the flowing of urban-rural population, poses new challenges to the local health care requirements. According to the latest statistics of the world bank in 2016, Although the percentage of health care in China is go from 3.5% of the gross domestic product (GDP) in 1995 to 6.2% by 2016, it still a long way off the 17.8% of which in the U.S. During the reform period from planning economy to the socialist market economy in China, there present an obvious, complicated and drastic trend of stratification, and the allocation of urban-rural resource is polarized [12]. The imbalance of development between urban and rural areas prompts the government to pay significantly less attention to rural health care than to urban areas [13,14], especially the striking gaps in investment of primary health care. Although the maternal mortality rate in urban and rural has dropped to 19.5 per 100,000 and 20 per 100,000 people, respectively (2016), the infant mortality rate in urban is only 4.7‰, while 9.6‰ in the rural, more than twice of the urban. There presences many serious problems in rural primary health care, such as insufficient funds, shortage of medical facilities and human resources, and structural imbalance in resource allocation [15], etc., and the gap of health care between urban and rural areas in China is still growing [16].

Renhe town is an economically developed and industrialized rural area south of China, one of the 100 pilot towns in China. Mingxing village is located in the north of Renhe town, Baiyun district, Guangzhou, neighboring the Liuxi river stream in the east, closely connecting with the new Baiyun international airport in the west, and transportation extending in all directions. The total area of this village is 2 square kilometers, with 1062 mu of cultivated land. There are 11 economic cooperatives in the village, and the villagers now mainly rely on farming, migrant working in Guangzhou, renting their rural collective land to the nearby airport logistics and storage, and/or working in the wrapping paper factory build in their village. There are 4069 native peoples, where 3225 are farmers and 1077 are immigrant laborers. In 2017, the per capita net income is 21,448 yuan and per capita consumption expenditure is 18,932 yuan in this village, corresponding to the national income level of 25,974 yuan and consumption of 18,322 yuan. It can be seen that residents in Mingxing village are at the same consumption level as the national average, but have a certain gap in per capita income, indicating that
they live in a worse condition. According to monitoring report of China’s rural poverty (2018), of all the possible reasons that Chinese farmers are unable to access appropriate medical services in time, money, and distance from hospital account for 14.6% and 80.3%, respectively [17]. A worsening economic burden limits possessing of nutrition, housing, and recreational opportunities, while too long distances to the hospital will increase the traffic cost (time and money) and restrict accessing of medical services. Therefore, it can be inferred that, compared to the rest of China, farmers in Mingxing village face more and more public health problems. In recent years, the government-led New Rural Cooperative Medical Insurance System (NCMS) aims to perfect the rural medical system, improve the health care services level, and prevent unaffordable medical expenses caused by poverty. Under this system, individuals will pay relatively low premiums through subsidies from local and central governments. By 2018, the system had covered 99.4% of the rural population. Because outpatient treatment costs much less than hospitalization [18], and the reimbursement rate of inpatient medical expenses (>50%) for the insured is much higher than that of outpatient medical expenses (very low or even zero), there exists a large gap between the repayment rate in hospitalization expenses (higher) and outpatient expenditure (lower), which obviously affects the patient’s medical choice [19], and causes the NCMS’ weakness in solving the potential health problems in rural areas. Low income, poor awareness of traditional health care, weak consciousness of seeking medical treatment, and inconvenient transportation are still the main and most serious obstacles to the health service utilization for residents in Renhe town. Health inequalities remain acute in rural areas.

The growing heterogeneity and inequality of different groups in different regions is still the focus for social scholars, psychologists, historians, economists and public health scholars. Lots of existing research explore the health status and health service utilization in urban-rural areas, and discuss how the susceptibility, ability, and demand conditions affect the health service utilization for rural residents [20–23]. Ashida Sato [24] and Kanuganti Shalini [25] respectively studied the data from the United States and Canada, and concluded that differences of health status and health service utilization exist in rural and urban areas. A similar situation happened in North America, such as in Mexico, where the elderly in rural enjoy less health services than those in urban [26]. At the same time, it is found that the accessibility of medical facilities, consciousness for hospitalizing, and educational level is critical factors in creating health inequality between urban and rural areas [27–29]. In the early 21st century, European countries faced with huge inequalities in population health as well. People with less education, lower occupational status or income often can not be treated fairly [30], and all of them with different welfare systems create health inequalities [31]. Currently, there are mainly two perspectives in explaining health inequality: one is the perspective from individualism, which holds that the difference in people’s health is from individual characteristics, such as genetic inheritance and educational level [32]. The other is the structuralist perspective, which emphasizes structural factors (such as markets and social institutions) that outside individual and the family but affect people’s health [33], such as welfare redistribution system and social stratification [34]. Previous studies overlooked the timing of health gains and changes, and failed to deeper understand of the evolution process and formation mechanism of health inequality. In recent years, it has been recognized that only by grasping the timeliness of events, can we obtain the essential understanding. Life course theory incorporates the concept of time into the empirical social science study explicitly. Another development is that emphasis of long-term studies of factors affecting health inequality. More and more scholars have attempt to integrate decades of life history information, and try to describe how the long-term socio-economic affect human health [35].

Since the 1960s, life course theory has been active in the field of social science research, which focuses on how factors, such as structure, sociality and culture, affect individual lives [35]. In recent decades, life course theory has gradually become an important analytical framework for studying of health and healthy behaviors. From the perspective of life course theory, the latest research about the influencing factors of health inequality mainly focus on two aspects: One is to pay attention to the long-term effects of early factors, and trace the origins of health inequalities “upstream” in the
There is no consensus in existing research on how early adversity indirectly affects health through adult experience or resources. Some scholars believe that experiencing chronic poverty has a more serious negative impact on mental health than short-term or intermittent poverty [37]. Some others think early poverty leads to health inequality in adulthood, but the duration of poverty is not directly related to subsequent health trajectory [38]. Therefore, one of the core issues needs to be addressed in life-course-based health research is how early experiences affect health inequalities decades later [39], how to combine the theory of life course and cumulative disadvantage, how do early misfortunes put people at higher risk and favorable experiences create opportunities, how do they interact to cause inequality and affect individual development trajectories over time [40]. The research on health inequality is mainly based on the accumulative disadvantage. Some studies show that the earliest injustices, in terms of urban-rural residence, gender, education level, etc., may continue to accumulate through individuals’ life course, making the rural elderly trapped in health inequality [41].

However, few scholars pay close attention to the rural elderly in developing countries. It is of special significance for China to study the influence of early unfortunate experiences on health inequality from the perspective of life course theory. With the profound social and economic changes in the past 40 years, especially the rapid progress of modernization and marketization, the long-term cumulative disadvantages in the life course of the rural elderly have made them trap in health inequality seriously. This paper aims at explaining the health status and health service utilization of the rural elderly in the metropolitan suburb in Guangzhou by the cumulative disadvantage theory from the perspective of life course and under Chinese situation.

Life course refers to the roles and events that individuals play in their lives. Life course theory focuses on the development from the perspective of life, looking for the junction between individuals and society, and emphasizing the combination of personal biological meaning and social meaning. This theory stressed that although individual is always in the process of building a certain society in a planned way, selectively promote their life course (namely people choose except under the influence of social situation, also influenced by personal experience and character, so in any social situation, the individual in the process of time still has a certain autonomy), but individual behavior can never out of their social background, but nested in a variety of specific social relations, individuals are integrated through various relations in certain groups, and affected by the events in the life of others. The life course theory highlights the heterogeneity of resource access and availability and emphasizes the impact of this difference on later life.

2. Data Source and Methods

2.1. Investigation Objects and Sampling

We conducted this research in Mingxing village, an industrialized rural area located in the outskirts of Renhe town, Guangzhou in 2017, and collected samples by random and wholly type sampling. Our investigation was conducted in cooperation with the local government. The inclusion criteria were: (1) residents age 60 years or older; (2) living in Mingxing village for more than 6 months; (3) adequate psychological stability so as to answer the questionnaire. Prior to the survey, village cadres helped us communicate with qualified interviewees, and provided the written consent to all participants who are completely voluntary before an interview with project guidelines. After exclusion by the eligibility criteria, 531 seniors met the requirements, and 122 of them expressed willingness to participate in our survey. Of the remaining 409 elderly, 79 could not be reached, 110 had no time for interview, and 120 were reluctant to participate because of privacy.

2.2. Indicators Selection

On the basis of the Fifth National Health Service Report (2013), our survey mainly includes the following aspects: (1) the interviewer’s personal information and physical condition,
including socio-economic characteristics, self-assessment of health status, disease prevalence, disability, and health risk index; (2) demand and utilization of health services, including treatment of any disease, satisfaction degree of medical demands, causes of their discontent, service condition of public health, outpatient, and hospitalization, as well as the payment capacity of the elder’s basic medical expenses; (3) villagers’ satisfaction to the service system, serving procedure, and the coverage and strength of medical insurance. One of the survey indicators, “Two-week prevalence”, mainly considers the residents’ need for health services, but is not strictly defined by objective medical examination. Participants with at least one of the following features will be thought to suffer from “Two-week prevalence”: (1) feel physically uncomfortable, visit medical institutes and confirm the illness, and finally received treatment; (2) feel unwell, do not visit the hospital for treatment, but self-medication or assistance at home; (3) feel unwell, do not see a doctor or self-medication and assistance at home, but absent from work, school or stay in bed for more than one day owing to his illness. “Two-week prevalence rate” is defined as the ratio of the number of patients who get sick within two weeks to the total number of respondents. “Two-week consultation rate” is defined as the ratio of the number of patients who visit medical institutes within two weeks to the total number of respondents. “Prevalence of chronic diseases”, an important parameter which indicates residents’ health status, disease burden and health service requirements, usually have two definitions. One is the number of patients suffers chronic diseases within 6 months against the total respondents; the other is case numbers, which means a person may suffer one to three diseases to be filled in during the survey, against the total. The former definition emphasizes the number of patients, regardless of how many diseases a chronic patient suffers from, and mainly reflects residents’ health status. The latter focuses on health service requirements. In this paper, “Prevalence of chronic diseases” is calculated according to the latter definition except for extra explanation. “Hospitalization rate” is estimated by the respondents’ hospitalizations in the past year, that is the number of hospitalizations in the past year against the total. “No hospitalization rate” is mainly measured in our paper as the number of patients who need to be hospitalized but reject going against all patients need to be treated in hospital. All the research data related to the above situation we reference to a careful check of the elderly medical records.

We provide a structure model, as in Figure 1, to explain and state our idea, analyze the health status and health services utilization of the elderly in Mingxing village by chi-square test, and qualitatively analyze and discuss the conclusion by the cumulative disadvantage theory during the life course.

![Figure 1. Framework of our research.](image)

2.3. Survey Description and Data Collection

Our investigators conducted face-to-face interviews at the respondents’ homes, and recorded the whole interview with a recorder. This interview survey provides informed consent for all participants
to fully understand the purpose of the questionnaire and voluntary participation. No personal information will be disclosed or used for commercial purposes, but only for academic research. Before the survey, professional investigators are invited to train the volunteers, and 7 graduate students (two of them from school of medicine and others major in human geography), attended a five-day training course, which include teaching skills in communicating with local communities, language (cantonese) expression, as well as operative and recording skills (such as how to judge eyesight, hearing, etc.). Rigorous and thorough training is required for them to manage the questionnaires and ensure their quality. Village cadres were responsible for guiding and organizing interviewees participate in the survey orderly, and recording their information to avoid duplicating investigations. Quality control and guidance personnel follow up all the way during the interview, and all survey reports were further validated by the trained director to ensure the accuracy and validity of the completed questionnaire.

In the questionnaire, interviewers judged the interviewees' auditory ability by whether they could clearly hear the questions during the survey, and the interviewee answers by choosing one of the following options: “Inaudible”, “Can hear clearly when you raise your voice” or “Hear clearly”. Visual acuity is based on how easy it is to recognize an acquaintance at a distance of 20 meters (allow interviewees answer this question with glasses), while respondents could choose the answer from: “Indiscernible”, “Slightly vague but identifiable” or “Easy recognition”. To determine whether the elderly have a language barrier, the interviewer asks: “Have you experienced any language difficulties in the past six months?”, and the interviewees only need to answer “Yes” or “No”. In terms of mobility testing, the interviewer asks: “How about your current state of mobility?”, then the interviewees could respond by choosing one of the following two options: “Can walk normally” or “Difficulty in walking (such as must rely on crutches) or have to bedridden”. When surveying for self-care ability, the interviewer asks: “Can you take care of yourself? (such as dressing, bathing and use the toilet)”, and collects answers in the form of “Yes” or “No”. The question for checking their ability in performing daily activities is: “Can you carry out normal daily activities (such as work, reading and housework)?” and the data collection form is “Yes” or “No”. The question to check for pain/discomfort and anxiety/depression are “Do you feel pain or discomfort?” and “Do you feel anxious or depressed?”, respectively. The corresponding answers of them are all in the form of “Yes” or “No”.

2.4. Data Processing and Statistical Analysis

Our research mainly compares the investigation results between the National Health Survey of rural areas and Mingxing Village on a range of indexes about life equality of the elderly. Researchers used SPSS software for data input, validation, and check, then form the database for our further research. SPSS22 is used for data analysis, and the database will be considered statistically significant when the $p$-value in the chi-square test is less than 0.05.

In the entire questionnaire, the Cronbach’s alpha is 0.747, greater than 0.6, which means our survey data has considerable reliability. Kaiser–Meyer–Olkin (KMO) value is 0.701, and the Bartlett’s test result is significant (normal approximation = 514.582, $p < 0.001$), all of which indicates that the data be suitable for factor analysis.

3. Results

In this survey, we interviewed 122 eligible elderly from Mingxing village in mandarin, where 12 of them could not communicate in cantonese or mandarin. The remaining 110 participants completed the questionnaire, but 10 in them had incomplete information. Therefore, we finally use 100 valid samples for research, and the effective recovery rate is 82% (100/122).

Table 1 gives a descriptive analysis of the socio-economic status about the elderly sampling from nationwide in 2013 and Mingxing village in 2017, respectively. Among them, the per capita income of the elderly in Mingxing village is 14,214 yuan in 2017, higher than those in nationwide (7621 yuan)
in 2013. More than half (55%) of the elderly are women, and 82% of them are married. Their ages between 60 and 69 years made up 49% of the total, 70 and 79 years made up 40%, and 11% over 80. Table 2 shows the health status of the interviewees, which is divided into physical and mental health. The investigation results show that the elderly suffering from varying degrees of distress in audition, eyesight, languages impressing, mobility, self-care ability, daily activity, body sensation, and mental health are 43%, 58%, 6%, 29%, 7%, and 35%, respectively. Above all, except for languages impressing and self-care ability, all the indicators of physical status worse than the national average. In terms of mental health, 21% of the elderly in Mingxing village suffer anxiety and depression symptoms, which higher than the national average for rural populations.

Table 1. Socio-economic status about the elderly sampling from the nationwide in 2013 and Mingxing village in 2017, and the corresponding chi-square test.

| Independent Variables | 2013 (National Survey) | 2017 (Mingxing Village) | $\chi^2$ | p-Value |
|-----------------------|-------------------------|--------------------------|---------|---------|
| Income                | 7621                    | 14,214                   | -       | -       |
| Gender                |                         |                          |         |         |
| Male                  | 14,513 (50%)            | 45 (45%)                 | 0.996   | 0.318   |
| Female                | 14,513 (50%)            | 55 (55%)                 |         |         |
| Age                   |                         |                          |         |         |
| 60–69                 | 17,764 (61.2%)          | 49 (49%)                 | 6.934   | 0.031   |
| 70–79                 | 8330 (28.7%)            | 40 (40%)                 |         |         |
| >80                   | 2932 (10.1%)            | 11 (11%)                 |         |         |
| Marital status        |                         |                          |         |         |
| Single                | 522 (1.8%)              | 1 (1%)                   | 1.758   | 0.553   |
| Married               | 21,828 (75.2%)          | 82 (82%)                 |         |         |
| Divorced              | 116 (0.4%)              | 0 (0%)                   |         |         |
| Widowed               | 6531 (22.5%)            | 17 (17%)                 |         |         |
| NCMS                  |                         |                          |         |         |
| Insured               | 20,754 (71.5%)          | 97 (97%)                 | 30.62   | <0.001  |
| Uninsured             | 8272 (28.5%)            | 3 (3%)                   |         |         |
| Total number          | 29,026                  | 100                      | -       | -       |

Table 2. Health status about the elderly sampling from the nationwide in 2013 and Mingxing village in 2017, and the corresponding chi-square test.

| Indicator               | Level       | National Survey | Mingxing Village | $\chi^2$ | p-Value |
|-------------------------|-------------|-----------------|------------------|---------|---------|
| Audition                | Hard        | 1858 (6.4%)     | 15 (15%)         | 17.727  | <0.001  |
|                         | Slight      | 5950 (20.5%)    | 28 (28%)         |         |         |
| Eyesight                | Extreme     | 1161 (4.0%)     | 17 (17%)         | 63.884  | <0.001  |
|                         | Moderate    | 7227 (24.9%)    | 41 (41%)         |         |         |
| Languages impressing    | Disorder    | 2932 (10.1%)    | 6 (6%)           | 1.848   | 0.174   |
| Mobility                | Disabled    | 4586 (15.8%)    | 29 (29%)         | 13.023  | <0.001  |
| Self-care ability       | Disabled    | 2554 (8.8%)     | 7 (7%)           | 0.402   | 0.526   |
| Daily activity          | Disabled    | 3744 (12.9%)    | 35 (35%)         | 43.112  | <0.001  |
| Body sensation          | Pain/Discomfort| 7692 (26.5%) | 83 (83%)        | 162.57  | <0.001  |
| Mental health           | Anxiety/Depression| 3193 (11%) | 21 (21%)        | 10.15   | <0.001  |

Table 3 compares the health service demand and utilization in the nationwide (2013) and the Mingxing village (2017) survey. The two-week prevalence, chronic disease prevalence and non-hospitalization rates of patients requiring hospitalization in Mingxing village are 78%, 85% and 53%, respectively, higher than the national survey (2013), while the two-week consultation rate and hospitalization rate are 33.3% and 15% respectively, both lower than 2013. Table 4 surveys the situation of the elderly choosing of medical treatment in the nationwide and Mingxing village survey. The results show that village clinics is the main choice for the elderly in all the two surveys, where the proportion in Mingxing village is 61.5%, higher than the value nationwide
(2013). The elderly who choose township hospitals account for 6.4%, lower than the nationwide in 2013, while the proportion choosing county hospitals, city hospital and above level is higher than the nationwide value.

Table 3. Comparison of the health service demand and utilization between the nationwide (2013) and Mingxing village (2017) survey, and the corresponding chi-square test.

| Indicator                        | (2013) National Survey | (2017) Mingxing Village | $\chi^2$ | p-Value |
|----------------------------------|------------------------|-------------------------|---------|---------|
| Two-week prevalence              | 13,294 (45.8%)         | 78 (78%)                | 41.609  | <0.001  |
| Two-week consultation rate       | 11,247 (84.6%)         | 26 (33.3%)              | 154.028 | <0.001  |
| Prevalence of chronic diseases   | 17,880 (61.6%)         | 85 (85%)                | 23.087  | <0.001  |
| Hospitalization rate             | 4876 (16.8%)           | 15 (15%)                | 0.231   | 0.631   |
| No hospitalization rate          | 5457 (18.8%)           | 53 (53%)                | 42.202  | <0.001  |

4. Discussion

Our research shows that, the elderly in Mingxing village are in a worse health status compared with the national level, and their daily health services depend mainly on the village clinics, which means they are at greater health risk. By the in-depth interview with the questionnaires, we attempt to explore the health disadvantages of the elderly in Mingxing village (Figure 2) using the cumulative disadvantage theory combined with the perspective of life course and the national conditions.

Figure 2. Analytical framework of cumulative health disadvantage.

Infancy. During the individual life course, the infant period is of particular importance for the formation of an individual’s later life, and even decisive. Statistics show that the elderly in this survey have an average age of 68.5 years old, and most of them were born around 1949. At that time, delivery mainly relied on barefoot doctors in the countryside, which have no guarantee to safety and health [42]. Native families experience poverty, extreme lack of material resources, and people’s basic living needs are still an urgent question. Through the interview, we learned that the elderly in
Mingxing village suffered starvation and malnourishment in infancy. This unfortunate experience will directly lead to loss of health status [43].

Adolescent. Adolescence is an important period for receiving education. Youth have weak subjective initiative, and the main activity space is confined to the private sphere. The trajectory of their life depends largely on parents’ choice and arrangement. Education, as a great decisive factor in an individual’s later career development, affects ones’ ability in obtaining scarce social resources, thus play an important role in their life course. Interviews found that 35% of the elderly in Mingxing village are illiterate, which is higher than the national level of 26.3% from the sixth census, and 42% of them with only elementary education. Lack of formal education increases the possibility of unemployment, leads to long-term low socio-economic status [44], and affects quality of life. Poor health literacy, coupled with lack of knowledge of preventive care and awareness of health services, and leads to worse health conditions [45, 46].

Adulthood. Adult individuals have developed their social roles as recipients, and gradually assume social and family responsibilities and obligations independently. Adulthood is divided into two stages, marriage and childbirth period and the development period. The former usually along with marriage and procreation, while the latter, as the continuation of the former, is mainly related to the development of personal career and family. At this stage of life course, individual plays multiple roles at once, such as looking after parents, educating their descendants, bearing more family responsibilities, they have to look for jobs. Due to loss of the early education, they have fewer job opportunities. We know from the interview that most elderly lack of professional skills, and can only be engaged in the low-ranking and informal jobs, thus resulting in lower income and greater pressure [47]. Bad habits formed in adulthood are also harmful to health, such as in our survey, up to 88.9% of the elderly male smoke and drink, which cause a continuous and cumulative disadvantage to health.

Senility. As physical function declines with aging, the role and identity of the elderly in the society and their family have changed correspondingly. From the perspective of life course, the elderly early life experiences present a cumulative effect in their later life, which is manifested in economic security, health care, marriage and family situation. With the existing urban-rural dual system, the vast majority of rural elderly do not have a pension, which exacerbates the gap between the rural and urban elderly. Meanwhile, with the decline of physical function, the elderly are beset with various diseases, and their medical care needs are far greater than other stages of their life course. Therefore, adequate medical resources have become an important guarantee for the elderly health in their later life. Mingxing village is located in the metropolitan suburb that far from the urban in Guangzhou. Most studies show that the actual distance from medical institutions is an important factor affecting residents’ health [48–50]. The investigation of Mingxing village found that children of the majority of the elderly are not around, but go out as migrant workers. So they lack necessary emotional communication and psychological comfort, and easily fall into a state of loneliness and helplessness [51]. In addition, loneliness itself has been proved to be closely related to chronic diseases, such as cardiovascular and cerebrovascular diseases, stomach diseases, lung diseases [52–54], and so on, while elevated blood pressure and arteriosclerosis [55, 56], as well as a series of complications, increase the elderly stress and anxiety [57], lead to depression [58], all of which forms a vicious cycle and results in much worse health status of the elderly in Mingxing village. The living environment can not be ignored in effecting health status. Since the new Baiyun airport in Guangzhou was opened in 2004, there are nearly 1400 departures and landings every day [59]. The noise and air pollution caused by aircraft and its exhaust are great harm to residents nearby. According to our examination of the investigation site, the indoor noise level has exceeded 85 decibels. Long-term noise pollution not only seriously affects residents’ physical [60, 61] and psychological health [62, 63], but also social health and well-being, thus aggravating social poverty [64]. From the secretary, Liang Jinming, in Mingxing village, we know that this village present within the noise area from airport. In order to improve the villagers’ life quality and health, Urban Planning Bureau and Natural Resources Bureau in Guangzhou has introduced policies about the noise control
of the Baiyun international airport in 2014 [65]. In January 2020, the government of Huadu district launched the plan about the third stage expanding construction project of Baiyun international airport and the compensation and resettlement for the noise area. Mingxing village has begun to implement the overall relocation plan. The resettlement camp will be built in Shihu village, 4 km away from the original site, and is expected to be completed in 2021 [66].

According to our survey, the two-week prevalence of the elderly in Mingxing village is 78%, far above the national population level (45.8%) in 2013. The two-week rate also shows significant gaps, where the result from Mingxing village is 33.3%, significantly lower than 84.6% that from the national rural. The coverage rate of the NCMS in Mingxing village reaches 97%, almost in line with the national rural average (97.3%) in 2013. The hospitalization rate in our survey of Mingxing village is 15%, also very close to the national level (16.8%) in 2013, which is consistent with the results from Yue et al [61,67]. Therefore, NCMS increase the utilization rate of inpatient services, but not improve the outpatient services of villagers. In addition, the rate of non-hospitalization but in need of hospitalization (53%) in Mingxing village is much higher than the national level (18.8%) in 2013. The results from the two surveys show that village clinics play a big role in choosing medical treatment, where Mingxing village even presents higher rate (61.5%) than the national rural average (56.5%). This benefit from the high reimbursement rate of NCMS in village clinics. Moreover, Mingxing village belongs to the outer suburbs of Guangzhou, the traffic is inconvenient. Meanwhile, the development of the village clinics has been a tremendous success, and very convenient for villagers. Therefore, more elderly would prefer to choose village clinics for medical treatment.

The main limitation of our research is that some subjective indicators were used in the questionnaire. We did not use the professional scale to measure participants’ physical and mental states, which may lead to bias in the results. Besides, limited by the difficulty of in-home survey and human resources, study from small-scale samples may not reveal significant associations between variables, which need further contrastive research from larger sample sizes. Thirdly, our research mainly base on the characteristics of rural in China, and based on Chinese datasets, may be lack of comparison with international cases, which is also what we want to focus on in the future. Finally, since there is no update on the national health service survey data, we used the data from 2013 for comparison. However, our research results are significant the healthy development of rural social. Besides, using the cumulative disadvantage theory of life course, we provide a new research idea for qualitative analysis and explanation of health inequality of rural elderly in developing countries.

5. Conclusions

Although the economic income and medical support level of the rural elderly in the metropolitan suburb have been improved to some extent, the health status and health service utilization for the elderly in Mingxing village are still worse than the national average. Poverty of the original family, lack of material resources in the early stage, deficiency of education, worse living environment, less income, lower economic and social status are all important factors that cause the health inequality amongst the elderly. With the popularization and improvement of the village clinics, the two-week consultation rate of the elderly in Mingxing village choosing village clinics is higher than the national rural average. Although NCMS policy, to a certain extent, reduces the medical burden of the villagers, with the urban-rural dual household registration system that has always existed in China, the social security and welfare regime of the rural elderly, relative to their daily economic expenditure, are still minimal. Their traditional life habits, cultural concepts, and willingness for seeking treatment have not kept pace with the development of urbanization.

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