

Inequality in health service utilization among migrant and local children: a cross-sectional survey of children aged 0–14 years in Shenzhen, China

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Research article

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Abstract

Background: Shenzhen has the largest number of migrant children of all cities in China. Unequal access to basic health services among migrant and local children greatly affects health equity and has a profound impact on the quality of human capital. This study aimed to investigate differences in child health management service utilization between local and migrant children in the Futian District of Shenzhen and to identify factors influencing these differences.

Methods: This study extracted the data on child health management in the Futian District of Shenzhen from the 2018 Survey of Health Service Needs of Chinese Residents in the New Era. The chi-square test was used to analyze differences between local and migrant children, and specific factors affecting child health management service utilization were analyzed with binary logistic regression.

Results: In this study, 1512 families in 12 communities in Futian District, Shenzhen were investigated. Among this families, 936 participants were aged 0-14 years, and the final effective sample size was 508. The greatest difference between migrant and local children was in the utilization of development guidance services (59% vs. 77.5%, $P < 0.001$). The main factors influencing physical examination, development guidance, disease prevention guidance, injury prevention guidance, oral health guidance and mental health guidance service utilization were mother's educational level, household registration, father's educational level, father's occupation and annual family income, household registration, the child's sex and father's occupation, respectively. The odds of having used disease prevention guidance were 2.257 times higher among children whose fathers had an undergraduate education or above compared with children whose fathers had a junior high school education or below (95% CI: 1.417–3.595). The odds of having used injury prevention guidance were 46.3% lower for children whose fathers were mixed white-/blue-collar workers compared with children whose fathers were white-collar workers (OR = 0.537, 95% CI: 0.361–0.799). The odds of having used mental health guidance were 52.2% lower among children whose fathers were mixed white-/blue-collar workers compared with those whose fathers were white-collar workers (OR = 0.478, 95% CI: 0.293–0.777).

Conclusions: In the Futian District of Shenzhen, health management service utilization is significantly lower among migrant children than among local children. Father's educational level and occupation limit the utilization of child health management services for migrant children. Fathers have a stronger influence on children's health service utilization than do mothers. The potential influence of fathers in promoting children's health maintenance should be carefully considered, and fathers' attention to children's health should be increased.

Introduction

Background

With the deepening of reform and development in China, many young and middle-aged people are migrating from rural areas to urban areas in search of better opportunities; at present, migrant workers

account for about 36% of the total labor force in China (1). According to the “Report on China’s Migrant Population Development 2016,” released by the Floating Population Services and Management Division of the National Population and Family Planning Commission, 60% of young and middle-aged migrants in China chose to migrate with their spouses and children in 2016, and the dominant migration pattern had changed from individual migration to family migration, resulting in a population of migrant children as part of the rapid urbanization of China(2). The “Interim Measure of School Education for Temporary Migrant Children,” which was jointly issued by the State Education Committee and the Public Security Department, defined migrant children as children and adolescents aged 0–14 years who live temporarily with their migrant-worker parents or other guardians in their new cities of residence for more than half a year (3). Migrant children are therefore defined as the children of migrant workers or rural-to-urban migrant laborers.

There is a clear separation between urban and rural household registration in China. Because of this separation in the household registration system, migrant children do not receive the same rights and treatment as local children registered in urban households (4). For example, in the 9-year compulsory education system, fees because of household registration system restrictions, migrant children are unable to meet the admission criteria for public schools and are unable to afford the high admission costs. Many migrant children therefore are only able to attend private schools with poor educational resources and insufficient teaching and learning conditions(5). Previous studies have also demonstrated that migrant children are a vulnerable group in terms of poor health, low quality of life(6,7), and low utilization of basic public health services (8-10), and there is a significant gap between migrant children and local children in nutritional health(11), basic health care (12-14), mental health(15), immunization(16,17), and life satisfaction(18). According to the “What Census Data Can Tell Us about Children in China: Facts and Figures 2015” United Nations Children’s Fund report, there were 34.26 million migrant children in China in 2015, with the largest numbers living in Shenzhen, Guangdong Province (19). The main reason for the large numbers of migrant children in Shenzhen is that, with the reforms and opening up seen in China, the small fishing village of Shenzhen developed into a modern city with the highest gross domestic product per capita in China, with the exception of Hong Kong, Macao, and Taiwan. Shenzhen’s economy was initially dominated mainly by labor-intensive industries, and the considerable income offered by jobs in these fields attracted a large number of laborers from all over the country (20). According to the *Shenzhen Statistical Yearbook 2019*, there were 1.2 million migrant children in Shenzhen, which corresponds to 13 migrant children per 100 total children in the city.

In recent years, the significant difference in the utilization of basic health services between migrant children and local children has attracted the attention of researchers. These researchers have mainly focused on the mechanism of health inequality, and most existing studies have reported that family social and economic inequalities are the main sources of health inequality for children (21, 22). Migrant children with economically disadvantaged families usually have worse health status than do other migrant children (23), mainly because socioeconomically vulnerable families do not have equal access to medical resources (24). Therefore, the health inequality between migrant children and local children can be explained, to a large extent, by the socioeconomic status of these children’s families. In addition,

parental occupation, education level, and marital status also have significant effects on children's health, and good child-raising practices are conducive to improving migrant children's health (25).

Migrant children's healthy development is important for China's future. "Healthy China 2030" pointed out the necessity of solving the health problems of key groups such as women and children, floating populations, and low-income groups. Therefore, solving the basic health problems of migrant children and reducing the health inequality between migrant children and local children are top priorities of China's health planning. The basic public health service system was established in China following the functional framework of basic public health put forward by the World Health Organization in 1998 (26) and the concept of the basic establishment of a relatively complete public health service system described in the "Opinions of the State Council on Deepening Medical and Healthcare System Reform," and the scope of this system has gradually been expanded (27). To solve the problems of large gaps in basic public health services between urban and rural areas, different regions, and various groups, and to address societal dissatisfaction with the reform of medicine and health care, China's health care reform plan proposed to improve the public financial system and promote the gradual equalization of basic public health services (28). At present, 11 types of basic public health services have been developed for urban and rural residents in China, including health file management, health education, vaccination, and child health management. The child health management services include physical examination, feeding guidance, development guidance, disease prevention guidance, injury prevention guidance, oral health care guidance, and mental health guidance. The implementation of measures to achieve equality in health services for children has, to some extent, improved maternal and child health indicators and advanced equality in China (28).

Objectives

Existing studies have mainly paid attention to the health problems of migrant children in terms of compulsory education (29,30), mental health (11)(15), and planned immunization (31-33), and there are few studies on the utilization of health management services by migrant children. However, the use of child health management services is important for health-related aspects such as children's physical health and mortality among children under 5 years of age (34). Therefore, the objectives of present study is to investigate differences between migrant children and local children in the utilization of child health management services (including physical examination, feeding guidance, development guidance, disease prevention guidance, injury prevention guidance, oral health guidance, and mental health guidance) and identified significant factors influencing these differences. On the basis of our findings, we propose several suggestions for improving the utilization of health services among migrant children.

Methods

Study design

The study was designed and implemented by the Research Center for Rural Health Services, Key Research Institute of Humanities & Social Sciences at Huazhong University of Science and Technology to

understand the health service needs of Chinese residents and the factors influencing these needs, and to provide a basis for primary health services to better meet residents' needs.

Before the survey, community investigators who administered the questionnaire were trained, and unified coding rules for the questionnaire and implementation steps for the survey were explained in detail.

For children younger than first-grade level (0–6 years of age), their parents or guardians completed the questionnaire on their behalf. Children at the second-grade level or higher (7–14 years of age) responded to the questionnaire themselves, with assistance from their parents or guardians. During questionnaire completion process, quality-control staff members were available to immediately clarify the questions to ensure the validity and reliability of the questionnaire.

For data entry, EpiData data-entry software was used by the community investigators and team members to create a database, and the accuracy of these data was checked to ensure the quality of the data input.

Setting

Shenzhen is one of China's special economic zones, which were established as part of the country's economic reforms and policy of opening to the world. Futian District, the central urban area and transportation hub in Shenzhen, has the largest population density in the city (35). The *Shenzhen Statistical Yearbook 2019* reported that, at the end of 2018, Futian District had an area of 78.66 square kilometers and a residential population of 1.6337 million, 591,500 of whom were a "floating population" not included in the household registration system. Futian District's gross domestic product in 2018 was 401.82592 billion yuan, and the total index of production was 107.4 (treating 2017 as 100). As of 2016, there were 10 streets (Yuanling, Nanyuan, Futian, Shatou, Meilin, Huafu, Xiangmihu, Lianhua, Huaqiangbei, and Fubao) and 94 communities in Futian District. In the survey used in the present study, the six streets in Futian District with the largest administrative areas and highest concentrations of floating population—namely, Meilin Street, Shatou Street, Xiangmihu Street, Futian Street, Lianhua Street, and Huafu Street—were selected. Two communities were then randomly selected from each of these six streets for the administration of a questionnaire survey.

Participants

Survey participants selected for this study were consistent with the definition of migrant children and adolescents in terms of age in the "Interim Measure of School Education for Temporary Migrant Children," which was jointly issued by the State Education Committee and the Public Security Department in 1998. The study therefore collected data on local children and migrant children living in Futian District in Shenzhen who were aged 0–14 years. Migrant children were defined as children aged 0–14 who were registered as living in other cities and who had lived with their migrant parents in Shenzhen for more than half a year without changing their household registration (indicating that, officially, no migration had occurred). Local children were defined as children aged 0–14 years whose city of registration was consistent with their place of residence, meaning that both were Shenzhen.

Variables

Dependent variable

In this study, health service utilization (the dependent variable) was operationalized as the utilization of the following services: physical examination, feeding guidance, development guidance, disease prevention guidance, injury prevention guidance, oral health guidance, and mental health guidance. For example, if the child had received a physical examination, the value of the dependent variable of physical examination utilization was coded as 1; otherwise, the variable was coded as 0.

Independent variables

The influencing factors included in this study included the child's sex, age, household registration status, and enrollment in medical insurance, as well as annual family income and both father's and mother's occupation, education level, and marital status. The coding of each of these variables is shown in Table 1.

The questionnaire also included items on geographical medical accessibility, such as the type of medical institution located closest to the family's home, the distance between the home and this medical institution, the type of transportation to the medical institution, and the time required to travel to the medical institution. There were also items on household expenditure, including annual family housing, food, and education expenditures. However, these items were not used in the present study for several reasons. First, because the survey respondents lived in communities with similar levels of economic development, each community was equipped with a similar level of community health service centers, so there was no variation in geographical medical accessibility among these respondents. Second, because child health management services are part of the national basic health services, these services are free to Chinese citizens through community health service centers; therefore, annual household expenditures would have no impact on the research results.

Data sources

The data used in this study comes from the Survey of Health Service Needs of Chinese Residents in the New Era, a nationally representative, large-scale longitudinal survey project designed and implemented by Research Center for Rural Health Services of Humanities & Social Sciences at Huazhong University of Science and Technology. In this study, only extracted the data on child health management in the Futian District of Shenzhen.

Statistical methods

SPSS, Version 24.0 was used to organize and analyze the data. Descriptive statistics were used to analyze the general demographic characteristics of the children and their parents. The chi-square test was used to analyze differences between migrant children and local children in terms of the use of basic

public health services. Binary logistic regression was used to analyze the specific factors influencing the difference in the utilization of basic health services between migrant children and local children.

Forward and backward methods in binary logistic regression analysis and different algorithms can lead to different results. Backward analysis assumes that there are N independent or predictor variables and initially includes all of these variables in a regression analysis. Then, examining the independent variables with P -values > 0.05 , the variable with highest P -value is discarded. This process is then repeated for the remaining $N - 1$ independent variables until only significant variables ($P < 0.05$) are included in the model. The forward algorithm, in contrast, carries out univariate regression analysis N times, conducting a separate univariate regression analysis for each independent variable. The variable with highest sum of squared is then selected and set as A, which is maintained in the regression model. Variable A and the remaining $N - 1$ independent variables are combined to form $N - 1$ two-variable regression models, and the process described above is repeated until the sum of squared of independent variable is no higher than that of the residual. Comparing the results of the two algorithms, the forward (conditional) algorithm was judged to be more suitable for the analysis of the present research model. Taking the utilization of a service as the dependent variable ($yes = 1, no = 0$), with the child's sex, enrollment in medical insurance, and household registration as well as annual family income and parental education level, occupation, and marital status as independent variables, this study analyzed the specific factors affecting the utilization of child health management services. In the analysis of the results, the significance level of $\alpha = 0.05$ was used, and applied two-tailed tests.

Results

Participants

In this study, 4408 people in 1512 families from 12 communities were investigated. Data were collected on 936 children aged 0–14 years through 936 separate questionnaires. Excluding incomplete questionnaires with missing responses on the main questions, 508 valid questionnaires remained for the analysis, yielding an effective response rate of 54.27%.

Descriptive data

The general demographic characteristics of the selected respondents are shown in Table 2. There were significant differences in annual family income, child's enrollment in medical insurance, and parental occupation and educational level between migrant children and local children ($P < 0.05$), but parental marital status did not differ significantly between migrant children and local children. The annual family income of migrant children was generally lower than that of local children: The families of 17.29% of the local children and of 39.13% of the migrant children were in the low-income group. Migrant children's level of health care was significantly lower than that of local children, with 30.43% of migrant children not being enrolled in basic health insurance or other commercial insurance. The percentage of children with fathers who performed mainly white-collar work was lower among migrant children (17.39%) than among local children (38.62%). The educational level of the parents of the migrant children was significantly

lower than that of the parents of the local children: The educational level of the local children's parents was mainly undergraduate or above, whereas the educational level of the migrant children's parents was mainly junior high school or below.

Main results

Utilization of child health management services

The utilization of health management services and differences in this utilization for local and migrant children are shown in Table 3. Generally, the percentages of children who had received a physical examination, development guidance, disease prevention guidance, injury prevention guidance, oral health care guidance, and mental health guidance were significantly lower among migrant children than among local children, but there was no significant difference in the use of feeding guidance services. Of the examined services, the difference in utilization between local children and migrant children was largest for development guidance, with 77.5% of local children but only 59% of migrant children having used these services. The percentages of migrant children who had used disease prevention guidance, injury prevention guidance, and oral health guidance were each below 50%. Notably, low percentages of both local children and migrant children had used mental health guidance services, which had been used by 18.1% of the children overall.

Factors influencing the utilization of health management services

Because there were significant differences between migrant children and local children on six variables assessing child health management services (physical examination, development guidance, disease prevention guidance, injury prevention guidance, oral health care guidance, and mental health guidance), we constructed six models. The variables listed in Table 4 were ultimately included in the final model after each binary logistic regression model was estimated as part of the forward (conditional) method.

The results showed that the most important factor influencing the utilization of physical examination services was mother's educational level. Compared with children whose mothers had a junior high school education or lower, the odds of having used physical examination services were 4.134 higher for children whose mothers had a senior high school/technical secondary school/junior college education and 4.230 times higher for children whose mothers had an undergraduate education or higher. The most important factor influencing the use of disease prevention guidance services was father's educational level. The odds of having used prevention guidance services were 2.257 times higher for children whose father had an undergraduate education or higher than for children whose father had a junior high school education or lower. The factors influencing the utilization of injury prevention guidance services were father's occupation and annual family income. In terms of father's occupation, the odds of having used injury prevention guidance services were 46.3% lower (odds ratio [OR] = 0.537) for children whose fathers were mixed white-/blue-collar workers compared with children whose fathers were white-collar workers. As for the effect of annual family income, the odds of having used injury prevention guidance were 62.4% higher (OR = 1.624) in the middle-income group and 20.016 times higher in the high-income group,

compared with the low-income group. The odds of having used mental health guidance services were 52.2% lower (OR = 0.478) for children whose fathers were mixed white-/blue-collar workers compared with children whose fathers were white-collar workers. In addition, the odds of having used mental health guidance services were 83.3% higher (OR = 1.833) for girls than for boys.

Discussion

Key results

First, we have found that the use of basic health services is significantly lower among migrant children than among local children, indicating the presence of health inequality between local children and migrant children. Second, compared with mothers, fathers have a stronger influence on children's health service utilization.

Limitations

This study had several limitations. The first limitation concerns the representativeness of the sample. The study respondents were all from the Futian District of Shenzhen, and the sample size was small. Although Shenzhen has the largest number of migrant children of all cities in China and the sample for the present study was representative to a certain extent, the results of the study may nevertheless have a certain bias. Second, regarding the effective response rate of the questionnaire, because this study examined children aged 0–14 years, the respondents were not fully able to complete the questionnaire, which therefore needed to be answered completely by their parents or with assistance from them. Thus, parents' busy work schedules and low educational levels—a situation that describes the parents of most migrant children—may have affected the integrity and effectiveness of the questionnaire. Third, the influencing factors included in this study are not complete because many factors can influence the utilization of child health services. This study considered only socioeconomic factors, and future studies should explore the internal mechanisms of health inequality among children from other perspectives. Fourth, in terms of the depth of the study, this study only explored the current situation and factors influencing the use of child health management services. The quality of these child health management services was not investigated. We also did not examine the outcomes of the use of child health management services, that is, the children's actual level of health.

Interpretation

The first key result that the presence of health inequality between local children and migrant children is consistent with the results of previous studies. For example, in a study conducted in Italy comparing the oral health of children from a floating population with that of local children, Ferrazzano et al. (2019) found that the decay-missing-filled teeth index, incidence of dental caries, and the Unmet Restorative Treatment Needs Index were higher among the floating population children than among other children (36).

The second key result of the greater impact of fathers than mothers on the child's health utilization is explained as follows:

It is generally believed that mothers are primarily responsible for the care of children, and our study confirms that the use of physical examination services is higher among children whose mothers have higher education, which is consistent with the results of Ni et al. (2019) (37). However, simultaneously examining various influencing factors shows that father's educational level and occupation actually have a higher impact on the use of child health management services compared with these characteristics among mothers. Moreover, the child's sex and father's occupation affect the use of mental health guidance services, which is consistent with a previous report by Zhang et al. (2019) finding that migrant children used fewer public mental health services than did local urban children and that migrant children thus exhibited more mental health problems [15]. In addition, we found that father's education level affects the use of disease prevention guidance services, and children whose fathers have an undergraduate education or higher have better health status than do children whose fathers have less education. Father's occupation and annual family income affect the use of injury prevention guidance services, which is especially high among children whose fathers are white-collar workers.

Our results are inconsistent with the findings of some previous studies. For example, in a study conducted by Wamani (2004), the most significant factor influencing the use of basic health services for children in Uganda was mother's educational level (38). We speculated that, because father's educational level affects the socioeconomic status of the family and is related to health literacy, father's educational level may serve to bridge the health gap between migrant children and local children. Concerning the context of China specifically, because of the influence of the three cardinal guides and the five constant virtues in traditional Chinese ethics, China is a strictly patriarchal country. Because father's educational level and occupation largely determine the socioeconomic status of the family, fathers may have a greater impact than mothers on the utilization of basic health services for children. The results of the present study are consistent with Wang's (2019) conclusion that father's educational level can reduce health inequalities between migrant and non-migrant children and between urban and rural children, demonstrating that father's educational level plays a significant role in regulating health equality (39).

Generalisability

On the basis of the above findings, we believe that several measures can potentially improve the use of health services among migrant children. First, in formulating policies on child health management, special attention should be paid to disease prevention guidance, injury prevention guidance, oral health guidance, and psychological guidance to increase the awareness of these services, which have low utilization rates among both migrant and local children. Second, special attention should be paid to satisfaction with basic health services for migrant children. Migrant children differ substantially from local children in terms of their needs for development guidance, oral health care, and other services; therefore, doctors in community health service centers should organize targeted development guidance and oral health care lectures to enhance the awareness of parents and children. Third, in public work with

communities, we should consider the characteristics of low educational level and mixed white-/blue-collar occupation type among the fathers of migrant children and formulate measures to attract the attention of these fathers, such as allowing them to take their children to community health service centers on a regular basis to receive health services. The aim of these measures is to encourage fathers to pay more attention to the healthy growth of their children.

Conclusions

This study discussed the inequality in health service utilization between migrant children and local children in the Futian District of Shenzhen, China. Fathers' influence on the utilization of child health management services was found to be more important than that of mothers, suggesting that we should encourage fathers to participate more in their children's health and that we should pay more attention to community health education. In the context of labor migration patterns changing from individual migration to family migration, this study is of great significance in improving the utilization of basic child health services and promoting the health of migrant children who are members of floating populations in China.

Abbreviations

CI: Confidence interval; Df: Degree of freedom; SSQ: Sum of Square

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Tongji Medical College of Huazhong University of Science and Technology (IRB No. S459,2018). With the approval of this committee, written informed consent was obtained from the parents or legal guardians, and oral consent was obtained from the children.

Consent to publish

This manuscript does not contain any individual person's data in any form.

Availability of data and materials

The data that support the findings of this study are available from the Research Center for Rural Health Services, Key Research Institute of Humanities & Social Sciences at Huazhong University of Science and Technology but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the Research Center for Rural Health Services, Key Research Institute of Humanities & Social Sciences at Huazhong University of Science and Technology.

Competing interests

The views expressed in the submitted article are the authors' own and not an official position of the institution or the funders. The authors declare no conflicts of interest.

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Authors' contributions

ZL and TWX performed the data extraction, conceived the research idea, developed the research design, and contributed to the manuscript revision. KXT performed the statistical analysis and drafted the manuscript. All authors read and approved the final manuscript.

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References

1. Fang L. The well-being of China's rural to urban migrant children: Dual impact of discriminatory abuse and poverty. *CHILD ABUSE NEGLECT*. 2020; 99:104265.
2. Department of Floating Population, National Health and Family Planning Commission. China's Floating Population Development Report in 2016. Available from: <http://www.nhc.gov.cn/rkjcyjtfzs/pgzdt/201610/57cf8a2bbafe4b4d9a7be10d10ae5ecf.shtml>. Cited 12 Jan 2020. [in Chinese]
3. Interim Measures for the Schooling of Floating Children and Juveniles. *People's Education*. 1998(05):8. [in Chinese]
4. Wang AQ. A Study of the Impact of Y Community Environment on the Behavior of Urban Migrant Children: Anhui University; 2018. [in Chinese]

5. Liu B, Zhang HY. Research on the Social Work Intervention Mode of Social Integration of Children of Migrant Workers. *Journal of Changchun University of Science and Technology (Social Science Edition)*. 2014;27(06):37-9. [in Chinese]
6. Wang HY. The Status Quo and Factors Affecting the Quality of Life of Migrant Children in China: based on Literature Review. *Journal of Jiangnan University (Humanities & Social Sciences)*. 2019;18(02):42-9. [in Chinese]
7. Titiporn T, Sataporn J, Yaowaluk W, Pigunkaew S, Rapeepong S. School health for migrant children: a myth or a must? Risk management and healthcare policy. 2019;12.
8. Li J, Liu H. Analysis on the Utilization of Mobile Children Health Care Services in Pingshan New District, Shenzhen. *Journal of Medical Theory and Practice*. 2019;32(08):1257-8. [in Chinese]
9. Cha DY, Shao XF, Zhou X, et al. Study on the Utilization of Children's Health Care Service and its Influencing Factors in Baiyun District, Guangzhou City. *Maternal and Child Health Care of China*. 2019;34(11):2429-31. [in Chinese]
10. Zhou MZ, Jiang SF. Research Progress on the Health Status and Influencing Factors of Migrant Children. *Journal of Traditional Chinese Medicine Management*. 2019;27(14):212-3.
11. Shen J. Effects of Staying and Moving on Children's Health: Based on Comprehensive Measures of Children's Health. *Jiangsu Social Sciences*. 2019(01):80-90. [in Chinese]
12. Fang XF. Current Situation of Health Care and Influencing Factors in Children Aged 0-3 years in Xingtian Community of Foshan City. *Journal of Modern Clinical Medicine*. 2019;45(01):16-8. [in Chinese]
13. Zhao F, Yang L, Wu CQ, et al. Current Status and Requirement of Healthcare Service Among Preschoolers in Hengyang City. *Practical Preventive Medicine*. 2019;26(06):719-21. [in Chinese]
14. Zhou TT, Zhang J, Peng YM, et al. Health Status of Non-registered Children Aged 0-6 years in Shanghai. *Shanghai Journal of Preventive Medicine*. 2019;31(05):369-72. [in Chinese]
15. Junhua Z, Li XY, Yang Y. Rural-urban Migration and Mental Health of Chinese Migrant Children: Systematic Review and Meta-analysis. *J AFFECT DISORDERS*. 2019;257.
16. He YH, Zeng Y. To explore the status of children's planned immunization in community and the influencing factors of children's planned immunization. *Capital food medicine*. 2019;26(04):74-5. [in Chinese]
17. Chen YR, Liu CF, Zhang J, et al. Influence of grid-based management of general medical team on "family-flowing" children's immunization program. *Henan Medical Research*. 2019;28(13):2307-11. [in Chinese]
18. Xie YT, Zeng SL. Meta-analysis on Subjective Well-being of Floating Children in 2006-2017. *Chinese Health Service Management*. 2019;36(01):69-71. [in Chinese]
19. United Nations Children's Fund. "What Census Data Can Tell Us about Children in China: Facts and Figures 2015" United Nations Children's Fund report, 2015.

20. Liu J X. The problems and countermeasures of floating population management in Shenzhen : Huazhong Normal University; 2011.[in Chinese]
21. Marmot M. Social determinants of health inequalities. *The Lancet*. 2005 2005-01-01;365(9464):1099-104.
22. Jensen SKG, Berens AE, Nelson CA. Effects of poverty on interacting biological systems underlying child development. *The Lancet Child & Adolescent Health*. 2017 2017-01-01;1(3):225-39.
23. Yolanda G, Unai M. [Health and determinants of health in second generations of international immigrants: Social inequalities in health since childhood?]. *GAC SANIT*. 2019;33(2).
24. Najman JM, Aird R, Bor W, O Callaghan M, Williams GM, Shuttlewood GJ. The generational transmission of socioeconomic inequalities in child cognitive development and emotional health. *SOC SCI MED*. 2004 2004-01-01;58(6):1147-58.
25. Chen Q, Zhang P, Li Y, et al. The correlation between the quality of life of migrant children and their parenting style. *maternal and child health care of china*. 2016;31(03):505-6. [in Chinese]
26. W BD, S S, H GE. Essential public health functions: results of the international Delphi study. *World health statistics quarterly. Rapport trimestriel de statistiques sanitaires mondiales*. 1998(1):44-54.
27. W N N, Li C Y, Lv J, et al. Implementation process and existing problems of equalization of basic public health services in China. *Chinese Health Resources*. 2015;18(01):4-7. [in Chinese]
28. Liu ZY, Xiao Y, Zhao K, Liu AZ. Implementation progress and effect of National Essential Public Health Services Program in China. *Chinese Journal of Public Health*. 2019;35(06):657-64. [in Chinese]
29. Wang H, Chen C J. The Influencing Factors of Compulsory Education Quality for Rural Migrants' children in Urban China Education Panel Survey. *China Economics of Education Review*. 2017;2(02):102-14. [in Chinese]
30. Maitra P, Peng X, Zhuang Y. Parental Education and Child Health: Evidence from China *. *ASIAN ECON J*. 2006 2006-03-01; 20:47-74.
31. Chen X Y, Li G R, Liu N, et al. Logistic regression analysis of influencing factors of children's vaccination. *Journal of hebei union university (medical science)*. 2013;15(05):618-20. [in Chinese]
32. Di W Y. Immunization status, influencing factors and coping strategies of migrant children. *World's latest medical information digest*. 2019;19(61):130-1. [in Chinese]
33. Hu Y C, Yu W, Bao W N, Ye W H. The category \bar{x} vaccination among one to seven-year-old children in Keqiao District. *preventive medicine*. 2019;31(09):927-9. [in Chinese]
34. National health and family planning commission. *Statistics on China's health and family planning in 2018*. Beijing: China union medical college press; 2018. [in Chinese]
35. Baidu. B. Futian Distric, Shenzhen.; 2016.Available from: <https://baike.baidu.com/item/Futia> Districts #4. Cited 15 Feb 2020.
36. F FG, T C, G S, A I, S R, B A, et al. Oral health status and Unmet Restorative Treatment Needs (UTN) in disadvantaged migrant and not migrant children in Italy. *European journal of paediatric dentistry*:

official journal of European Academy of Paediatric Dentistry. 2019;20(1).

37. Ni BY, Zhang JR, Ji Y, Chang C, Wang YL. Effect of Migrant Status of 0-6-year-old Children on Child Health Care Utilization Among Migrant Population. *Maternal and Child Health Care of China*. 2019;34(17):3880-3. [in Chinese]
38. Wamani H, Tylleskär T, Åstrøm AN, Tumwine JK, Peterson S. Mothers' education but not fathers' education, household assets or land ownership is the best predictor of child health inequalities in rural Uganda. *INT J EQUITY HEALTH*. 2004 2004-01-01;3(1):9.
39. Dianxi W. Reduction but not elimination: health inequalities among urban, migrant, and rural children in China-the moderating effect of the fathers' education level. *BMC PUBLIC HEALTH*. 2019;19(1).

Tables

Table 1. Coding of the independent variables

Variable	Assignment
Gender	Male=1; female=2
Household registration	Local child=1; mobile child=2
Family annual income	0 to 0.15 million yuan=1; 0.15 to 0.5 million yuan=2; 0.5 to 1 million yuan=3; more than 1 million yuan=4
Medical insurance of Child	Basic health insurance only =1; commercial insurance only =2; basic medical insurance + commercial insurance =3; no insurance or others=4
Occupation of the parents	white-collar workers =1; blue-collar workers =2; Mixed white-/blue-collar workers =3; others=4
Education level of the parents	Junior high school and below =1; Senior high school/ technical secondary school/ junior college=2; bachelor degree or above =3
Marital status of the parents	Unmarried =1; married=2; divorced=3; widowed=4

Note: For parental occupation, white-collar workers included staff members of the government or other institutions, clerks, and related personnel, whereas blue-collar workers included laborers in the industries of agriculture, forestry, animal husbandry, fishing, and water conservancy, as well as production and transportation equipment operators. Mixed white-/blue-collar workers included professional and technical personnel, commercial workers, and service personnel.

Table 2. Demographic characteristics of the surveyed children by migration status

Investigated factor	Local child (n=347)	Migrate child (n=161)	χ^2	P-Value
Gender			0.470	0.493
Male	187 (53.89%)	92 (57.14%)		
Female	160 (46.11%)	69 (42.86%)		
Annual family income			41.619	<0.001
Low (less than 0.15 million yuan)	60 (17.29%)	63 (39.13%)		
Medium (0.15-0.5 million yuan)	211 (60.81%)	90 (55.90%)		
Medium to high (0.5-1 million yuan)	67 (19.31%)	6 (3.73%)		
High (1 million yuan or higher)	9 (2.59%)	2 (1.24%)		
Child medical insurance participation			38.084	<0.001
Basic health insurance only	169 (48.70%)	80 (49.69%)		
Commercial insurance only	39 (11.24%)	8 (4.97%)		
Basic medical insurance + commercial insurance	101 (29.11%)	24 (14.91%)		
No insurance or others	38 (10.95%)	49 (30.43%)		
Occupation of father			36.437	<0.001
White-collar workers	134 (38.62%)	28 (17.39%)		
Blue-collar workers	22 (6.34%)	6 (3.73%)		
Mixed white-/blue-collar workers	177 (51.01%)	104 (64.60%)		
Others	14 (4.03%)	23 (14.29%)		
Occupation of mother			12.162	0.007
White-collar workers	166 (47.84%)	70 (43.48%)		
Blue-collar workers	26 (7.49%)	6 (3.73%)		
Mixed white-/blue-collar workers	132 (38.04%)	60 (37.27%)		
Others	23 (6.63%)	25 (15.53%)		
Education level of father			100.268	<0.001
Junior high school and below	40 (11.53%)	68 (42.24%)		
Senior high school/ technical secondary school/ junior college	102 (29.39%)	68 (42.24%)		
Bachelor degree or above	205 (59.08%)	25 (15.53%)		
Education level of mother			80.931	<0.001
Junior high school and below	67 (19.31%)	83 (51.55%)		
Senior high school/ technical secondary school/ junior college	116 (33.43%)	61 (37.89%)		
Bachelor degree or above	164 (47.26%)	17 (10.56%)		
Marital status of father			1.075	0.783
Unmarried	13 (3.75%)	5 (3.11%)		
Married	330 (95.10%)	155 (96.27%)		
Divorced	2 (0.58%)	0 (0%)		
Widowed	2 (0.58%)	1 (0.62%)		
Marital status of mother			2.305	0.512
Unmarried	4 (1.15%)	4 (2.48%)		
Married	332 (95.68%)	150 (93.23%)		
Divorced	5 (1.44%)	2 (1.24%)		
Widowed	6 (1.73%)	5 (3.11%)		

Table 3. Differences between local children and migrant children in the utilization of health services

Basic child health management services	Overall (n=508)	Household registration		χ^2	P value
		Local children(n=347)	Migrant children (n=161)		
Physical examination	477 (93.9%)	333 (96.0%)	144 (89.4%)	8.170	0.004
Feeding guidance	369 (73.1%)	261 (75.2%)	108 (67.1%)	3.662	0.056
Development guidance	364 (71.7%)	269 (77.5%)	95 (59.0%)	18.562	<0.001
Disease prevention guidance	273 (53.7%)	201 (57.9%)	72 (44.7%)	7.713	0.005
Injury prevention guidance	238 (46.9%)	178 (51.3%)	60 (37.3%)	8.693	0.003
Oral health guidance	265 (52.2%)	197 (56.8%)	68 (42.2%)	9.313	0.002
Mental health guidance	93 (18.1%)	72 (20.7%)	21 (13.0%)	4.366	0.037
None	9 (1.8%)	3 (0.9%)	6 (3.7%)	5.177	0.023
Unclear	11 (2.2%)	3 (0.9%)	8 (5.0%)	8.745	0.003

Table 4. Binary logistic regression analysis of factors influencing the utilization of child health management services

	β (95%CI)	Standard error	Wald test	Df	P-Value	Exp(β)	95% confidence interval
Physical examination							
Maternal level of the mother (control = junior high school and below)	1.931	0.245	61.857	1	<0.001	6.895	-
Junior high school/ technical secondary school/ junior	1.419	0.482	8.652	1	0.003	4.134	(1.606,10.642)
Senior high school degree or above	1.442	0.482	8.941	1	0.003	4.230	(1.644,10.888)
Development guidance							
Household registration (control = local children) (P<0.001)	1.238	0.129	92.6775	1	<0.001	3.449	-
Migrant children	-0.874	0.205	18.085	1	<0.001	0.417	(0.279,0.624)
Disease prevention guidance							
Maternal level of the father (control = junior high school and below) (P=0.001)	-0.298	0.195	2.353	1	0.125	0.742	-
Junior high school/ technical secondary school/ junior	0.251	0.248	1.029	1	0.310	1.286	(0.791,2.090)
Senior high school degree or above	0.814	0.238	11.739	1	0.001	2.257	(1.417,3.595)
Injury prevention guidance							
Occupation of the father (control = White-collar workers) (P=0.002)	-0.088	0.242	0.132	1	0.716	0.916	-
White-collar workers	-0.288	0.413	0.487	1	0.485	0.750	(0.334,1.684)
White/blue-collar workers	-0.622	0.203	9.381	1	0.002	0.537	(0.361,0.799)
Unemployed	-1.240	0.418	8.808	1	0.003	0.289	(0.128,0.656)
Family monthly income (control = less than 0.15 million yuan) (P=0.001)	0.476	0.227	4.415	1	0.036	1.610	(1.033,2.511)
Less than 0.15 million yuan	0.485	0.308	2.474	1	0.116	1.624	(0.888,2.970)
0.15 million yuan or higher	2.997	1.071	7.822	1	0.005	20.016	(2.451,163.436)
Oral health care guidance							
Household registration (control = local children) (P=0.002)	0.273	0.108	6.327	1	0.012	1.313	-
Migrant children	-0.586	0.193	9.220	1	0.002	0.557	(0.381,0.813)
Mental health guidance							
Gender of the father (control = male) (P=0.009)	-1.341	0.218	37.953	1	<0.001	0.262	-
Female	0.606	0.235	6.673	1	0.010	1.833	(1.157,2.904)
Occupation of the father (control = White-collar workers) (P=0.014)	-0.244	0.498	0.240	1	0.625	0.784	(0.295,2.080)
White/blue-collar workers	-0.739	0.249	8.841	1	0.003	0.478	(0.293,0.777)
Unemployed	-1.050	0.562	3.495	1	0.602	0.350	(0.116,1.052)

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