

Physical examination service utilization among seasonal immigrants in Sanya, China: a cross-sectional study

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Abstract

Background This paper is to explore the influencing factors on utilizing physical examinations (PE) for the seasonal immigrants who moved from their home town to Sanya city in Hainan province in China during the winter .

Methods A total of 1342 seasonal immigrants (aged 50 or over) were randomly selected and surveyed through a standardized questionnaire. Using an adjusted logistic regression model to identify the factors associated with the use of PE for those immigrants.

Results We found the utilization rate of PE among seasonal immigrants is 26.80%. The level of education, living time, the availability of health insurance, and the attitude to the quality of health service were influencing factors($p < 0.05$).

Conclusion The results imply seasonal immigrants have a low utilization rate of physical examination. To improve the availability of health insurance and the quality of health service will be helpful to keep the health of the seasonal immigrants in Sanya .

1. Introduction

The impact of climate change on the health has become a worldwide phenomenon, it may increase the frequency or severity of extreme weather.^{1,2} The extreme weather have led to great threaten to human health especially for the elder. The risk of mortality and morbidity during heatwaves and cold spell are particularly high for older people in care homes^{3,4}. Some studies showed that increasing in temperature above the 90th percentile of maximum temperature would increase respiratory admissions for the 75 plus age group and in New York people over 75 were found to have a higher rates of respiratory and cardiovascular morbidity compared to the younger population in heatwave days^{5,6}. The mortality also high in extreme weather among the older. Heat waves in London, Budapest and Milan were associated with increases in all-cause, respiratory and cardiovascular mortality for those aged over 75 and this result was consist with other studies^{7,8}. In the cold spell days the main affected objects also are those elder. S Hajat found a mean relative risk was 1.06 if per degree decrease below the cold threshold (set at the 5th centile) and elderly people, were most vulnerable³. For adapting those extreme weather, increasing retiree choose to migrate in different season. This phenomenon of seasonal immigration first appeared in the United State. They moved from the cold districts to the warm sunshine zones during winter and in summer they would immigrant from the hot area to the cool region.⁹ This phenomenon also appeared in Australia and Sweden.^{10,11} There are also large-scale floating population in China, especially for the elderly who take seasonal leisure and keep health as the main purpose.¹² One research reported Hainan Province has attracted about 450,000 seasonal immigrants during the winter.¹³

Most seasonal immigrants are the elderly^{10,14}. Once they moved to a new area, it will mean they have to spend time to adapt the new environment and may be exposure to new risk factors. Early examine the level of physical health will found the risk factors in time and to lower the chance of getting illness. And lots of studies have demonstrated that periodic physical examination is an effective measure to prevent illness and keep health.^{15,16} The most elderly have one or more chronic diseases, such as cerebrovascular disease, hypertension, diabetes, respiratory disease.¹⁷ So they need more regular physical examination. But seasonal immigrants were not like the local residents who could get a regular physical examination, which make them into a weak position of not getting full health service. Therefore, utilization rate of physical examination is an effective index which could help to assess the level of health service for the seasonal immigrants. Once there is a lower rate of physical examination for the immigrants in the destination, they will have to face a higher risk than the local residents or Economic losses.

Some studies have analyzed the factors which effected the utilization rate of physical examination, such as health knowledge, income level, education background^{18,19}. Xi Sun found above 65.50% people aged 60 or over in rural China taking annual physical examinations²⁰. Another study found the utilization rate of annual physical examinations in urban elderly is 76.20% in Shandong Province and residents with basic health insurance are more likely to use PE²¹. However, most studies

focused on long-term residents, there are almost no studies about the use of PE among the group of seasonal immigrants. This present study aims to explore the utilization rate of the PE among those seasonal immigrants and identify the risk factors associated with the use of PE. Finally the study will make some suggestions to government and improve the level of health services for the seasonal immigrants

2. Methods

2.1. Participants

The participants was selected through the local 'Migratory Birds Association' which recorded where have the most number of migrants and we got the data of the floating population through the sixth national census which recorded the number of the population in the city and village. Multistage sampling method was used to selected participants. First, there are four districts in Sanya and one community in each district were selected randomly (Teng hai community, Li zhigou community, Jin jiling community, Dong guan community) as study sites. Second, selecting participants by randomly sampling method from the selected sites. The objects must be not the local residents and over 50 years old. And before survey, we will further check the object whether she or he is a migrant from other province through inquiry and ask several leading number from their identity card. In each site, we calculate the number by the formula of random sampling. In total, 1342 participants aged 50 or over were sampled and completed the survey.

2.2. Procedures

Participants were asked about their demographic background, hospital experience and general opinions about health care, and to answer the questions on the questionnaire. We ask whether they got the physical examination during the trip as the object variable. The study was approved by the ethics committee of the university. All participants were provided with informed consent and obtained monetary compensation.

2.3. Variables

Social demographic characteristics included gender (male vs female), age (50–59; 60–69; 70–79; 80+), household registration (rural vs. urban), education (junior high school or below; senior school; college or above), marital status (single vs. couple), economic status (poor; normal; good), working status (working vs retired), living time (1 or 2 months; 3 or 4 month; 5 months above) in Sanya, time with friends (little time; Once in a while; often), health insurance (None; Urban Employee Basic Medical Insurance, UEBMI; Urban Resident Basic Medical Insurance, URBMI; New Cooperative Medical System, NCMS; Public Medical Care, PMC), health insurance whether can be used in Sanya (yes vs.no), and the attitude to quality of health service (worse than origin; same as origin; better than origin). The major information about physical health including long-term medication (yes vs. no), number of chronic disease (none; 1 or 2; 3 or 4; 5 or above). PE was measured by a question of "Did you have any physical examinations during the past month you came here". The answer included "yes" and "no".

2.4. Statistical analysis

We employed a logistic regression model to identify the factors associated with utilization of PE in seasonal immigrants. The dependent variable was PE, independent variables are other variables we discussed above. Statistical significance level was 0.05.

3. Results

3.1. Social demographic characteristics

Most seasonal immigrants (92.30%) were Urban residents and more than half (56.80%) of participants were female. Participants were aged 60-69 (56.60%) and more than 75% participants had educational level above high school. Other social demographic characteristics are presented in Table1.

3.2. Utilization of Physical examination

Among 1342 participants, only 26.80% seasonal immigrants were the user of PE(Table1). Results from the unadjusted model shown those who age exceed 70 ($p<0.05$), who have retired ($p<0.05$), who have a long time living in Sanya ($p<0.05$), who have long-term medication ($p<0.05$), whose health insurance can be used in Sanya, who have more types of chronic disease ($p<0.05$) are more likely to use PE.

Table 1. The use of physical examination and the unadjusted model of factors associated with physical examination.

| Characteristics | Total(N%) | PE ^a Use(N%) | | Unadjusted model | | |
|--------------------------------------|------------|-------------------------|-----------|------------------|-----------|-------|
| | | Yes | No | OR | 95%CI | P |
| Observations | 1342 | 360(26.8) | 982(73.2) | | | |
| household registration | | | | | | |
| Rural | 103(7.7) | 29(28.2) | 74(71.8) | 1.00 | | |
| Urban | 1239(92.3) | 331(26.7) | 908(73.3) | 0.93 | 0.59-1.46 | 0.770 |
| Gender | | | | | | |
| Male | 580(43.2) | 151(26.0) | 429(74.0) | 1.00 | | |
| Female | 762(56.8) | 209(27.4) | 553(72.6) | 1.07 | 0.83-1.36 | 0.577 |
| Age | | | | | | |
| 50-59 | 248(18.4) | 54(21.8) | 194(78.2) | 1.00 | | |
| 60-69 | 759(56.6) | 203(26.7) | 556(73.3) | 1.34 | 0.95-1.89 | 0.093 |
| 70-79 | 302(22.5) | 89(29.5) | 213(70.5) | 1.56 | 1.05-2.31 | 0.027 |
| 80+ | 33(2.5) | 14(42.4) | 19(57.6) | 2.81 | 1.31-6.01 | 0.008 |
| Education | | | | | | |
| Junior school or below | 304(22.6) | 106(34.9) | 198(65.1) | 1.00 | | |
| Senior school | 602(44.9) | 151(25.1) | 451(74.9) | 0.64 | 0.47-0.87 | 0.005 |
| College or above | 436(32.5) | 103(23.6) | 333(76.4) | 0.59 | 0.43-0.83 | 0.003 |
| Marital status | | | | | | |
| Single | 131(9.8) | 32(24.4) | 99(75.6) | 1.00 | | |
| Couple | 1211(90.2) | 328(27.1) | 883(72.9) | 1.29 | 0.84-1.98 | 0.243 |
| Economic status | | | | | | |
| Poor | 425(31.7) | 124(29.2) | 301(70.8) | 1.00 | | |
| Normal | 679(50.6) | 178(26.2) | 501(73.8) | 0.91 | 0.68-1.22 | 0.567 |
| Good | 238(17.7) | 58(24.4) | 180(75.6) | 0.86 | 0.57-1.30 | 0.497 |
| Working status | | | | | | |
| Working | 73(5.4) | 19(26.0) | 54(74.0) | 1.00 | | |
| Retired | 1269(94.6) | 341(26.9) | 928(73.1) | 0.83 | 0.46-1.49 | 0.537 |
| Living time | | | | | | |
| 1 or 2 months | 300(22.4) | 56(18.7) | 244(81.3) | 1.00 | | |
| 3 or 4 months | 466(34.7) | 116(24.9) | 350(75.1) | 1.42 | 0.99-2.05 | 0.056 |
| 5 months above | 576(42.9) | 188(32.6) | 388(67.4) | 2.07 | 1.46-2.93 | 0.000 |
| Time with friends | | | | | | |
| Little time | 87(6.4) | 23(26.4) | 64(73.6) | 1.00 | | |
| Once in a while | 241(18) | 57(23.7) | 184(73.6) | 0.91 | 0.51-1.62 | 0.767 |
| Often | 1014(75.6) | 280(27.6) | 734(72.4) | 1.05 | 0.63-1.75 | 0.830 |
| Long-term medication | | | | | | |
| No | 738(55) | 177(24.0) | 561(76.0) | 1.00 | | |
| Yes | 604(45) | 183(30.3) | 421(69.7) | 1.37 | 1.08-1.75 | 0.010 |
| Type of health insurance | | | | | | |
| None | 139(10.4) | 47(33.8) | 92(66.2) | 1.00 | | |
| UEBMI ^c | 598(44.6) | 138(23.1) | 460(76.9) | 0.58 | 0.39-0.87 | 0.009 |
| URBMI ^d | 177(13.2) | 32(18.1) | 145(81.9) | 0.43 | 0.25-0.72 | 0.002 |
| NCMS ^e | 57(4.2) | 12(21.1) | 45(78.9) | 0.52 | 0.25-1.08 | 0.080 |
| PMC ^f | 371(27.6) | 131(35.3) | 240(64.7) | 1.06 | 0.70-1.61 | 0.752 |
| Health insurance whether can be used | | | | | | |
| No | 1008(75.1) | 225(22.3) | 783(77.7) | 1.00 | | |
| Yes | 334(24.9) | 135(40.4) | 199(59.6) | 2.21 | 1.69-2.90 | 0.000 |
| Quality of health service | | | | | | |
| Worse than origin | 661(49.2) | 146(22.1) | 515(77.9) | 1.00 | | |
| Same as origin | 457(34.1) | 137(30.0) | 320(70.0) | 1.46 | 1.10-1.93 | 0.008 |
| Better than origin | 224(16.7) | 77(34.4) | 147(65.6) | 1.78 | 1.26-2.52 | 0.001 |
| Number of chronic disease | | | | | | |
| None | 172(12.8) | 34(19.8) | 138(80.2) | 1.00 | | |
| 1 or 2 | 702(52.3) | 175(24.9) | 527(75.1) | 1.33 | 0.89-2.03 | 0.229 |
| 3 or 4 | 265(19.7) | 83(31.3) | 182(68.7) | 1.85 | 1.17-2.92 | 0.008 |
| 5 or above | 203(15.2) | 68(33.5) | 135(66.5) | 2.04 | 1.27-3.28 | 0.003 |

3.3. Predictors of utilization of physical examination among seasonal immigrants.

Adjusted binary logistic regression model is conducted to identify the factors associated with the use of PE (Table2). Four factors are found to be statistically associated with the use of PE ($p<0.05$), including education level, living time in Sanya, health insurance whether can be used and quality of health service. Those who living in Sanya more than 5 months (AOR =1.67, $p=0.005$), health insurance can be used in Sanya (AOR=2.14, $p=0.000$), and who thinking Sanya had a better quality of health service (AOR=1.43, $p=0.000$) are more likely to use PE.

Table 2. The factors influencing the utilization of physical examination among seasonal immigrants

| Factor | β | SE | Wals | P | OR | 95%cl |
|--------------------------------------|---------|-------|--------|-------|-------|-------------|
| Age | -0.180 | 0.098 | 3.521 | 0.061 | 0.831 | 0.686~1.008 |
| Education | 0.340 | 0.095 | 13.144 | <0.01 | 1.412 | 1.172~1.701 |
| Living time | 0.270 | 0.093 | 8.698 | 0.005 | 1.670 | 1.163~2.401 |
| Long-term medication | 0.247 | 0.144 | 2.952 | 0.086 | 1.280 | 0.966~1.695 |
| Type of health insurance | 0.064 | 0.060 | 1.136 | 0.286 | 1.066 | 0.948~1.198 |
| Health insurance whether can be used | 0.761 | 0.153 | 24.695 | <0.01 | 2.140 | 1.585~2.888 |
| Quality of health service | 0.357 | 0.090 | 15.892 | <0.01 | 1.430 | 1.199~1.704 |
| Constant term | -1.127 | .608 | 3.437 | 1 | 0.064 | |

4. Discussion

Climate change have made some serious impact for the human health around the world. For avoiding or lowering this threaten, many people have to move to a suitable region in different season. Comparing with the local residents, most immigrants were the elder, they have to spend more time to adapt the new environment. In the field of health service, they could not get the regular physical examination like the local residents. Especially in China, the distribution of medical resources is unbalanced and there are lots floating population who set in a weak position and cannot receive a timely treatment once they got illness. In China, in the winter, the northern region have a lowest temperature than other regions and with the climate change, the cold spell days is becoming more frequent and longer. Lots elderly residents have to move to a warm area to avoid the impact of cold weather and Hainan province as the southernmost region with a suitable climate in the winter attracts lots elderly people to visit and live there until Spring comes next year. In this study we survey the level of utilization of physical examination for those seasonal immigrants and analyze the factors of influencing the physical examination.

In this study we found only 26.80% seasonal immigrants received PE. This prevalence is much lower than previous studies by Ge DD et al. (76.20%)²¹ and Sun X et al. (63.50%)²⁰. Some reasons may explain this result. First, almost seasonal immigrants came to Sanya during the winter, and most temporarily lived nearly half of a year in Sanya without the normal health services like the local residents. Then lot of them came to Sanya just to relax themselves and didn't pay much attention to the regular physical examinations.

In this study we don't find the difference in the use of PE between rural and urban. This is different from the previous studies, which reported the utilization rate of PE among urban residents was higher than residents in rural residents.^{21,22} That maybe due to there are huge differences in health resources between city and country, but those seasonal immigrants use the same health resources in Sanya which reduced the impact from differences of medical resource between city and country²³. We had not found evidence for the impact of genders, age, marital status, economic status, working status on the utilization of physical examination and this is not consistent with previous studies.²⁴⁻²⁷ Gong CH et al. found PE increased significantly by age and those who had higher household expenditure were also more likely to have PE.²⁸ However, we can't get the same result, that could be explained that since in 2003 China introduced New Cooperative Medical Scheme, which enhanced the financing standard and reduced the burden for the low income families.²⁹ Most seasonal immigrants came to Sanya with their spouse and they have the same lifestyle, so between the different gender, there may be not much difference in the utilization of PE. With the growth of age, we find the utilization rate of PE also improved (50–59, 21.80%; 60–69, 26.70%, 70–79, 29.50%; 80+, 42.40%), but the logistic regression model display age wasn't the influencing factor. But in the model we find the AOR of age over 80 is 1.81 and the AOR95%CL was 0.80–4.07 which was a wide confidence interval. In addition to this,

we find the percent of age over 80 was only 2.50%, which may effect on the final analysis. So a further research is needed to understand whether the age effect the use of PE.

Consisting with one previous study³⁰, we found seasonal immigrants with lower education compared with those college or advanced degrees, would be more like to use PE. But there also have some studies got the contrary conclusion. Some studies found people with higher education will be more positive to have PE and high education mean high economic status and more active to search for PE^{28,21}. People with high education also mean they may have a high awareness of self-care, they could use more way to find self-health status like smart phone, family doctor which could decrease the frequency of going to the hospital for PE.³²

In this study we find the time with living in Sanya is one influencing factor for the use of PE, which could be explained that when immigrants come into a new place with the living-time going, they maybe exposure more harmful factors. Especially Hainan belongs to the largest tropical monsoon region³³ and with a higher temperature than other districts in China. The longer immigrants live in there, the more possible people exposure to high temperatures. And lots of studies have shown high temperature will bring many negative impacts on people especially for those who with disease like respiratory disease, cardiovascular disease^{34,35}.

Unexpected, not like other study^{21,36,37}, we found these without health insurance rather than those with health insurance (UEBMI: AOR = 0.59, p = 0.015; URBMI: AOR = 0.49, p = 0.012), were more like to have PE. That may be related with the availability of local health service. We found although about 80.60% seasonal immigrants have the health insurance or enjoy public medical care, actually those whose health insurance could be used in Sanya was only about 24.90%. So, most immigrants can't timely get the health services. People with health insurance could be used in Sanya would be more like to have PE (AOR = 2.19, p < 0.001), which further explained the importance of the availability of health insurance in Sanya. Through surveying the attitude to the quality of health service in Sanya, we could analyze subjective influences to get PE. The higher the degree of evaluation, the more likely to participate in the PE (Same as origin: AOR = 1.51, p = 0.005; Better than origin: AOR = 1.74, p = 0.002) which consist with another research³⁸. When people believe the level of health services, they may be willing to accept the relevant treatment with a positive attitude.

Seasonal immigrants is becoming more common due to climate change around the world and improve the level of health services for the immigrants in the immigrant land is very important to keep their heath. And through this study in China we found the level of physical examination is low for the seasonal immigrants which give an information that government need to pay more attention to the immigrants and take effective measures to meet health demand of immigrants.

5. Conclusions

Seasonal immigrants in Sanya had a low physical examination utilization, which may effect on their health especially for the elderly. This study emphasized the importance of improving the availability of health insurance in Sanya, which could expand the health effects of health insurance, and enhance the utilization rate of PE. This study also implied local medical system need to improve the quality of health service in Sanya, indirectly increasing satisfaction and confidence of seasonal immigrants for local health service.

6. Declarations

Ethical Approval and Consent to participate

This research have got the Ethical Approval and Consent to participate.

Consent for publication

We are consent for publication.

Availability of data and materials

There are availability of data and materials.

Competing interests

There is no Competing interests.

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Authors' contributions

The method of the research was design by Dr Li.Yue-wei chen write this paper under the guide of Dr Li.Dr Yao and Dr Yin given some crucial suggestion to analyze the data. Mrs Geng and Zhang help to disposal data. Dr Hu help to practice this research.

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