

The Establishment of Health Records of Residents in Main Urban Areas of Chongqing: A Cross-sectional Study

Linlin Yang^{1, 2, 3}, Guizhong Tang^{1, 2, 3, *}, Zhongchen He⁴, Tingting Wu^{1, 2, 3}, Xiandong Feng^{1, 2, 3}, Zhongcan Wang^{1, 2, 3}

¹School of Public Health and Management, Chongqing Medical University, Chongqing, China

²Research Center for Medicine and Social Development, Chongqing, China

³Innovation Center for Social Risk Governance in Health, Chongqing, China

⁴Chongqing Health Inspection, Chongqing Municipal Health and Family Planning Commission, Chongqing, China

Email address:

1007245150@qq.com (Linlin Yang), tangguizhong0325@sina.com (Guizhong Tang), 971636460@qq.com (Zhongchen He), 454827112@qq.com (Tingting Wu), 1062162621@qq.com (Xiandong Feng), 1610689481@qq.com (Zhongcan Wang)

*Corresponding author

To cite this article:

Linlin Yang, Guizhong Tang, Zhongchen He, Tingting Wu, Xiandong Feng, Zhongcan Wang. The Establishment of Health Records of Residents in Main Urban Areas of Chongqing: A Cross-sectional Study. *Clinical Medicine Research*. Vol. 9, No. 2, 2020, pp. 35-41. doi: 10.11648/j.cmr.20200902.12

Received: March 11, 2020; **Accepted:** March 27, 2020; **Published:** April 7, 2020

Abstract: Objective: To describe the current situation of health records establishment of residents in main urban areas of Chongqing, analyze its influencing factors and provide reference suggestions to promote the establishment of residents' health records, so as to narrow the gap between China and other countries. Methods: A self-designed questionnaire survey was conducted among 900 residents who had lived in nine districts of Chongqing for more than 6 months by stratified random sampling. Results: In 2018, 61.4% of the sample population in the main urban area of Chongqing had health records, while 20% didn't have health records and 18.5% were unclear about whether they had health records or not; Differences in gender, age, educational background, occupation, household registration, housing type were statistically significant for the establishment of health records ($P < 0.05$); Polytomous logistic regression analysis showed that gender, age, educational background, occupation, household registration were the influencing factors of the establishment of health records. Conclusion: The rate of residents in the main urban areas of Chongqing who have health records needs to be improved. It is hard to establish health records for male, low-educated and floating population. Therefore, the third-party organizations and media should play a role in promoting the establishment of health records for such populations under the leadership of government departments, in order to make contributions to narrowing the gap between China and other countries.

Keywords: Public Health, Healthcare, Social Medicine, Residents' Health Records, The Status of Archiving, Influencing Factors

1. Introduction

As one of the important projects to promote the equalization of basic public health services, residents' health records are not only conducive to improving the accessibility and feasibility of basic public health services in China, but also to improving the health level and awareness of residents [1]. According to Healthy China strategy, population health information platforms at the provincial, municipal and county levels that are used for exchanging and sharing residents' health information with

standardized application should be established by 2030. By then, everyone should have standardized electronic health records and fully functional health cards, which can fully realize the standardized management and use of population health information and meet the needs of personalized services [2]. In the report of the Nineteenth National Congress of the Communist Party of China, we should improve the national health policy and provide people with all-round and full-cycle national health information services integrating prevention, treatment, rehabilitation and autonomous health management [3].

Resident health records cover all health-related records in one's whole life, including basic personal information, health examinations, health management records of key groups and other medical and health service records, such as reception, referral, consultation records, etc [4]. By the end of 2016, 88.56% of Chinese residents had established health records, and some developed regions such as Shanghai, Guangzhou and Hangzhou had established electronic health records that can be shared and used, and opened the use of citizens' electronic health cards [5]. However, on the whole, the development of resident health records in various regions is unbalanced, the sharing mechanism of archives has not been established, and there are still some problems in some areas, such as insufficient and repeated archives, low quality of archives, low utilization rate and so on [6-13]. Compared with foreign countries, which use health records to improve the quality of health care services, carry out epidemiological studies, and improve related health information technology, and integrate advanced multidisciplinary methods to study health records to promote personalized medical services, domestic health records focus more on the analysis of key groups and special groups, and explore the mode of community health management, and strengthen the research of health records informationization [14-24].

To sum up, the study showed that there were still some gaps in the construction of health records between China and other countries, for this reason, this study used self-designed questionnaires to investigate and analyze the situation of the establishment of health records of Chongqing residents as well as its influencing factors based on the implementation of Healthy China strategy in order to find out the factors that hinder the construction of health records, provide reference suggestions for promoting the establishment of residents' health records and further narrow the gap between China and other countries.

2. Methods

2.1. Subjects of the Investigation and Sampling

In the nine administrative districts of the urban areas of Chongqing (Yuzhong District, Jiulongpo District, Dadukou District, Shapingba District, Yubei District, Jiangbei District, Nan'an District, Beibei District, Banan District), the stratified random sampling method was used to conduct a questionnaire survey on 900 permanent residents. Inclusion criteria: residents who lived in the urban areas of Chongqing for more than 6 months and had normal comprehension and expression ability. Firstly, we enrolled the study subjects by quota according to the population distribution of the nine districts in the urban areas in the Chongqing Statistical Yearbook 2017, including 69 people in Yuzhong District, 126 people in Jiulongpo District, 35 people in Dadukou District, 121 people in Shapingba District, 170 people in Yubei District, 90 people in Jiangbei District, 90 people in Nan'an District, 86 people in Beibei District and 113 people in Banan District; Secondly, according to the street distribution of the administrative divisions in the main urban areas of Chongqing, four streets were randomly selected from each district; Finally, 8 to 43

eligible subjects were selected from each street by quota.

The questionnaire was designed by brainstorming and expert consultation method. In July-September 2018, field surveys were conducted on subjects by unified trained investigators. First of all, we explained the meaning of the health file to the survey participants, and asked them to fill in the questionnaire after they completely understood the questions and to check for omissions and errors on the spot once they finished the questionnaire. The questionnaire mainly includes the following two aspects: (1) Basic information, including gender, age, educational background, household registration, housing type, residence time, health status and economic status, etc; (2) The establishment of health records of residents, including whether they have health records or not, if they have health records, when have they established it; if don't, the reasons why they haven't established health records. A total of 900 questionnaires were sent out and 848 valid questionnaires were collected, with an effective rate of about 94.2%.

Patient and public involvement: No patient involved.

2.2. Independent Variables

We selected demographic and social conditions characteristics as independent variables, in which economic status and health status mainly refer to the self-evaluation of the sample population.

Demographic and social conditions characteristics: major demographic characteristics were gender, age, educational background, occupations. We divided the participants into five age groups (Under 20, 20 to 30, 30 to 40, 40 to 50, and 50 over); The sex was divided into male and female; Academic qualifications were divided into five groups (Primary school and below, junior high school, High School or Technical School, College or bachelor, Master or above); seven groups Occupations (Administrative organs or military personnel, State-owned enterprises or institutions, Other enterprises or individual businesses, Farmers or migrant workers, Freelance or unemployed, student, Retired). social conditions include household registration (rural, urban), four groups housing types (Self-owned Commercial Housing, Rural self-built House, Rental Room, Unit Dormitory), six groups residence time (Under 10, 10 to 20, 20 to 30, 30 to 40, 40 to 50, 50 and over), five groups family economic status and health status (Very well, Well, General, Bad, Very bad).

2.3. Outcome Variables

The dependent variable is the condition of the establishment of health records or not. The survey question is "Do you have a health record"? The subjects were divided into three categories: Filed, Unfiled and unclear. Those who filed further asked about the time of filing, and those who did not file further asked about the reason for not filing.

2.4. Statistical Analysis

Data were doubly input by excel and analyzed by SPSS 21.0 software, including descriptive statistics Chi-square

analysis was used to compare the establishment of health records of residents with different characteristics. Multivariate logistic regression was used to analyze the factors influencing the establishment of health records ($\alpha=0.05$). $P < 0.05$ was considered statistically significant.

3. Results

3.1. Establishment of Health Records

The results showed that 521 (61.5%) people had health records, and the average duration of their health records was (3.31 ± 2.358) years; There were 170 (20%) and 157 (18.5%) people who did not have health records or were unclear about their health records status. The main reasons of not having health records are: 35.1% of the subjects do not know where to establish their health records; 25.6% of the subjects have

received treatment in large hospitals and consider it pointless to establish health records in the community; 23.2% of the subjects are too busy to get their health records established; 10.9% of the subjects think that health records are likely to disclose their personal information; 5.2% of the subjects think there are other causes for why they do not have health records.

3.2. Comparison of Health Record Establishment of Residents

The results showed that there were significant differences in the establishment of health records among residents of different genders and ages, and with different educational background, occupations, household registration and housing types ($P < 0.05$). However, there was no significant differences in the residence time ($\chi^2=9.831$, $P=0.455$), family economic status ($P=0.172$) and health status ($P=0.425$). (Table 1)

Table 1. Comparison of health records of residents with different characteristics.

characteristic	eigenvalue	N	Filed		Unfiled		Unclear		Chi-square Value	P-value
			Number	%	Number	%	Number	%		
Gender	Men	391	219	56.0	90	23.0	82	21.0	9.038	0.011*
	Women	457	302	66.1	80	17.5	75	16.4		
Age group	<20	116	42	36.2	28	24.1	46	39.7	76.301	<0.001*
	20~30	251	135	53.8	55	21.9	61	24.2		
	30~40	198	136	68.7	39	19.7	23	11.6		
	40~50	116	89	76.7	20	17.2	7	6.0		
	>51	167	119	71.3	28	16.8	20	12.0		
	Primary school and below	60	32	53.3	16	26.7	12	20.0		
Education background	junior high school	153	72	47.1	40	26.1	41	26.8	34.804	<0.001*
	High School or Technical School	201	150	74.6	32	15.9	19	9.5		
	College or bachelor	416	258	62.0	78	18.8	80	19.2		
	Master or above	18	9	50.0	4	22.2	5	27.8		
	Administrative organs or military personnel	19	6	31.6	7	36.8	6	31.6		
Occupation	State-owned enterprises or institutions	83	41	49.4	30	36.1	12	14.5	158.702	<0.001*
	Other enterprises or individual businesses	173	134	77.5	23	13.3	16	9.2		
	Farmers or migrant workers	51	24	47.1	12	23.5	15	29.4		
	Freelance or unemployed	221	149	67.4	53	24.0	19	8.6		
	student	152	52	34.2	24	15.8	76	50.0		
	Retired	149	115	77.2	21	14.1	13	8.7		
Household registration	rural	358	187	52.2	91	25.4	80	22.3	22.319	<0.001*
	urban	490	334	68.2	79	16.1	77	15.7		
Housing type	Self-owned Commercial Housing	632	406	64.2	124	19.6	102	16.1	23.629	<0.001*
	Rural self-built House	20	12	60.0	1	5.0	7	35.0		
	Rental Room	126	69	54.8	34	27.0	23	18.3		
	Unit Dormitory	70	34	48.6	11	15.7	25	35.7		
	<10	665	398	59.8	136	20.5	131	19.7		
Residence time	10~20	124	81	65.3	24	19.4	19	15.3	9.831	0.455
	20~30	27	21	77.8	5	18.5	1	3.7		
	30~40	14	9	64.3	3	21.4	2	14.3		
	40~50	10	6	60.0	1	10.0	3	30.0		
	>50	8	6	75.0	1	12.5	1	12.5		
	Very well	20	13	65.0	3	15.0	4	20.0		
Family economic status	Well	78	38	48.7	24	30.8	16	20.5	11.557	0.172
	General	714	453	63.4	135	18.9	126	17.6		
	Bad	27	13	48.1	6	22.2	8	29.6		
	Very bad	9	4	44.4	2	22.2	3	33.3		
	Very well	61	35	57.4	41	16.4	16	26.2		
	Well	173	107	61.8	38	22.0	28	16.2		
Health status	General	394	239	60.7	85	21.6	70	17.8	8.087	0.425
	Bad	161	106	65.8	28	17.4	27	16.8		
	Very bad	59	34	57.6	9	15.3	16	27.1		

Note: * $p < 0.05$.

3.3. Logistic Regression Analysis on the Factors Influencing the Establishment of Health Records

The multivariate logistic regression model was established with the status of health record of resident as the dependent variable (resident having health records were marked as 1, residents not having health records were marked as 2, residents who were unclear about their health record status were marked as 3, which was a reference category) and the six

influencing factors (gender, age, educational background, occupation, household registration and housing type) used as independent variables. The results showed that gender, age, educational background, occupation and household registration were the influencing factors of residents having health records; age and occupation were the influencing factors of residents having no health records ($P < 0.05$). (Table 2)

Table 2. The Multivariate Logistic Regression Analysis on the Establishment of Residents' Health Records.

Variables	Reference Group	Filed OR	95%CI	P-value	Unfiled OR	95%CI	P-value
Gender							
Women	Men	2.113	1.346~3.315	0.001*	1.049	0.637~1.728	0.850
Age Group							
>50		4.853	1.148~20.522	0.032*	0.978	0.200~4.793	0.978
40~50	<20	5.455	1.613~18.454	0.006*	1.291	0.341~4.894	0.707
30~40		1.480	0.583~3.744	0.408	0.483	0.170~1.372	0.172
20~30		0.610	0.294~1.264	0.184	0.348	0.147~0.821	0.016*
Education							
Master or above		7.133	1.344~37.861	0.021*	2.322	0.361~14.933	0.375
College or bachelor	Primary school	9.631	3.363~27.588	0.000*	2.460	0.778~7.780	0.125
High School or Technical School	and below	10.905	3.789~31.383	0.000*	2.647	0.833~8.410	0.099
junior high school		0.931	0.385~2.253	0.875	0.980	0.368~2.605	0.967
Occupation							
Retired		7.157	1.215~42.169	0.030*	1.280	0.026~7.945	0.791
student		0.673	0.167~2.719	0.579	0.185	0.045~0.758	0.019*
Freelance or unemployed	Administrative	15.024	3.701~60.985	0.000*	3.615	0.929~14.065	0.064
Farmers or migrant workers	organs or military	3.989	0.797~19.980	0.092	0.930	0.182~4.743	0.930
Other enterprises or individual businesses	personnel	14.750	3.767~57.749	0.000*	1.550	0.406~5.921	0.521
State-owned enterprises or institutions		3.166	0.795~12.610	0.102	2.149	0.574~8.041	0.256
Household registration							
Urban	rural	1.693	1.034~2.772	0.036*	1.028	0.594~1.777	0.922
Housing type							
Self-owned Commercial Housing		0.452	0.221~0.926	0.030*	0.868	0.361~2.087	0.752
Rural self-built House	Unit Dormitory	0.418	0.115~1.518	0.185	0.143	0.014~1.457	0.100
Rental Room		0.519	0.213~1.265	0.149	0.891	0.314~2.525	0.828
Y-intercept		0.021			0.883		

Note: * $p < 0.05$; The women, age group after 40, High School or Technical School, College or bachelor, Master or above, Retired, student, Freelance or unemployed, Other enterprises or individual businesses, Urban, Self-owned Commercial Housing.

In the "filed" model, women were more likely to establish health records than men ($OR=2.113$, $P=0.001$), compared with the "unclear" category. Urban residents were more likely to establish health records than rural residents ($OR=1.693$, $P=0.036$). Residents over the age of 40 were more likely to establish health records than those under the age of 20 (the 40 to 50 group $OR=5.455$, $P=0.006$; Group over 50 years old $OR=4.853$, $P=0.032$). Residents with high or higher educational background were more likely to establish health records than those with primary school or lower educational background ($OR=10.905$, $P < 0.001$; $OR=9.631$, $P < 0.001$; $OR=7.133$, $P=0.021$). Freelancers or unemployed, other enterprises or individual industrial and commercial households, retired residents were more likely to establish health records than administrative staff or soldiers ($OR=15.024$, $P < 0.001$; $OR=14.750$, $P < 0.001$; $OR=7.157$, $P=0.030$). In the "unfiled" model, residents between 20 and 30 years old were more likely to have their health records established than those under 20 years old ($OR=0.348$,

$P=0.016$). Administrative staff or soldiers were more likely to establish health records than students ($OR=0.185$, $P=0.019$).

4. Discussion

This study found that the rate of health record establishment of residents in the urban areas of Chongqing needs to be improved. There is a certain gap between the rate of Chongqing residents and that of China's urban and rural residents of 80.6%[25]. This may be due to insufficient publicity of health records, lagging information construction, inadequate staff, facilities and equipment in primary medical institutions, and low utilization rate of health records in Chongqing. Most residents consider the establishment of health records as meaningless, thus lack of initiatives to establish one [26]. Therefore, in the construction of health records, we should not only further promote the construction of health information, strictly standardize the techniques and data types of health records, build a unified management

software, strengthen the training of technicians and managers, but also promote the government as a leading role to provide policies, funds and other resources for the construction of Health records, so as to realize the information sharing, ensure the goal of "one person, one file", and achieve good performance in the management of health records.

Compared with men, a larger proportion of women tend to establish health records. It might because men are busy working as spiritual and economic pillars in their family and have no time to take care of their own health problems, while women need more medical and health services due to physiological factors and are more likely to establish health records, which is consistent with the results of Jiang's (2015) research [27]. Also, the rate of health record establishment of non-rural residents is higher, which might because that the mobility of rural residents is relatively strong, and the informatization of health records has not yet fully matched with the actual demands. In addition, there is a certain gap between urban and rural areas in the propaganda and implementation degree of the health record establishment system [28]. The proportion of residents over the age of 40 is larger than the proportion of residents under 20 years old, which may be caused by the increasing incidence of disease in people over 40 years old, the strong demand for health services, and the willingness to establish health records after 40. The rate of residents with higher educational background who have health records is higher than those with lower educational background. The reason for this might be that residents with higher educational background work in a more stable environment with better welfare benefits and stronger health care awareness, moreover, they are more inclined to seek medical treatment and receive health management services if they are sick [29]. The rate of retired residents with health records is higher than those who haven't retired yet, which might because that retired residents spend more time at home and are easy to accept community health service management. In addition, the incidence of chronic diseases in the elderly is relatively high, which requires continuous health management and tends to cooperate with the establishment of active health records.

Therefore, in the process of establishing health records, emphasis should be placed on male, low-educated and floating population. New and traditional media such as WeChat, microblog, TV, newspaper and so on can be widely used to strengthen the after-treatment service for residents. At the same time, New and traditional media can also broaden the channels of health records publicity, strengthen residents' cognition of health record establishment, and change their health concept of treating diseases only but neglecting prevention. In addition, we can also adopt the way of government purchasing services, let the third-party organizations play their functions, regularly provide physical examination for key groups, enhance their enthusiasm to establish health records, ensure the utilization rate of health records, and promote the rate of residents who have health records through widely utilizing them.

5. Conclusion

The implementation of establishing health records for residents is imperative, although there is a certain gap between the rate of residents who have health records in Chongqing and that of urban and rural residents in China, Chongqing has been working hard to improve this situation. In accordance with the national policies such as the Outline of Healthy China 2030 Plan, Chongqing has completed the upgrade of city-county regional information platform and the application of the integration of electronic medical records, electronic health records, and household information databases, and the query system for personal health information has been preliminarily established. The individual electronic health record has been authorized for query in pilot districts and counties to facilitate the "Internet +" personal health intelligent management, etc [30]. It is suggested that relevant staff should pay attention to the influence of the basic personal conditions of residents on the improvement of health record establishment, and pay full attention to the weak groups such as male, low-educated people and floating population. Under the leadership of the government, the third-party organizations and media should be brought into function in the promotion of health record establishment for vulnerable groups, so as to enhance the health record establishment of residents in Chongqing and narrow the gap between China and other countries.

Contributors

YLL and TGZ are joint first authors. YLL, TGZ, and HE designed the study. YLL, WTT, FXD, and WZC collected the data. WTT, FXD and WZC analyzed the data. YLL drafted the manuscript. TGZ contributed to the interpretation of the results and critical revision of the manuscript for important intellectual content and approved the final version of the manuscript. All authors have read and approved the final manuscript. TGZ and HZC are the study guarantors.

Funding

This research was funded by a postgraduate grant from Chongqing Medical University.

Competing Interests

All the authors do not have any possible conflicts of interest.

Strengths and Limitations of This Study

1. Chongqing has not yet conducted a specialized study on this subject, and this article is original.
2. The object of this study is unclassified and is the whole population of Chongqing, so we can have a comprehensive understanding of residents' health records archiving.

3. The research objects only include nine districts of Chongqing, and the disabled, illness and other groups whose health conditions need to be documented are not covered, which results in a certain bias in the representativeness of the results, and the extrapolation of the results is limited to some extent.

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