Analysis of Factors Influencing Inpatient and Outpatient Satisfaction with the Chinese Military Health Service

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Abstract

Background

Relatively few articles have focused on exploring factors influencing soldiers’ overall satisfaction and differences between inpatients’ and outpatients’ satisfaction, particularly in the Chinese army. Elucidating factors influencing military inpatient and outpatient care separately and analyzing their differences may provide more information for the healthcare system.

Methods

The Revised China National Health Service Survey questionnaire was used in the survey. The questionnaire included 5 sections and 32 items concerning demographic, inpatient, and outpatient characteristics and perception variables for both inpatients and outpatients. Bivariate and multivariate techniques were used to reveal relationships between satisfaction and the variables assessed.

Results

Outpatients’ and inpatients’ overall satisfaction rates were 19.0% and 18.5%, respectively. The strongest determinant of outpatients’ satisfaction was satisfaction with doctor’s communication regarding therapeutic regimen followed by length of military service, level of trust in medical staff, and disease severity. Determinants of inpatients’ satisfaction included staff categories, satisfaction with environment, and satisfaction with medical quality.

Conclusion

The factors influencing military outpatients’ satisfaction differed from those of inpatients. Exploring the causes of satisfaction and dissatisfaction with military health institutions is important in their fulfillment of their responsibility to maintain soldiers’ health.
Introduction

Patients’ perception of healthcare is a critical indicator in measuring medical service quality. Medical disputes and violence against Chinese medical personnel often originate from a gap between care provision and patient expectations concerning ideal care. [1] Schoenfeld et al. posited that determining the aspects of health services that influence satisfaction is essential in evaluating intervention effectiveness and improving care quality. [2] In 2009, The Chinese government started their medical and health service system reform to achieve more affordable national health care. A series of policies were enacted to improve the medical care and service system, public health system and the drug supply system. These factors could be used to guide the health system revolution. In the military health service, efficient improvement of medical care quality could consolidate soldiers’ fighting capacity. Therefore, exploration of the causes of satisfaction or dissatisfaction with military health institutions is of interest to the Military Ministry of Health in China.

Many researchers have explored the structure and factors influencing patient satisfaction and concluded that it is a multidimensional concept containing influential factors such as demographic characteristics, belief in care, waiting time, and information provision. Boudreaux argued that patients’ subjective experiences, rather than demographic and visit-related factors, are the most consistent determinants of satisfaction. [3] Similarly, Newsome and Wright (1999) reviewed 46 patientsatisfaction studies and found that the factors most commonly related to patient satisfaction were technical competence, interpersonal factors, convenience, costs, and facilities. [4] Bredartet al. posited that patients’ judgments regarding care quality are important for satisfaction with the technical quality of care, providers’ interpersonal skills, coordination, continuity, waiting times, availability, and physical environment. [5, 6] Further, efficient doctor-patient communication was emphasized in previous studies, while the environment was not. Predictors of satisfaction vary according to setting, and improving key factors could advance healthcare quality and satisfaction.

Although various studies have focused on exploring factors influencing civilian satisfaction, relatively few have involved military personnel, particularly those in the Chinese army. In China, military patients’ options are limited to specific health institutions while the citizen can receive civilian healthcare whenever and wherever they want which is of great difference. The military Soldiers’ health is directly related to troops’ daily training and fighting capacity. Consequently, military hospitals are important in guaranteeing military officers’ and soldiers’ health. But just like the normal hospitals in China, military hospitals face serious challenge of uneven development. Grassroots medical institutions serve for great numbers of soldiers in China without advanced medical equipment and experienced medical staffs. Exploration of related satisfaction influencing factors is very meaningful. A database search revealed only 7 articles describing soldiers’ satisfaction with military healthcare and its influencing factors. Chaffin et al. and Chisick et al. explored military soldiers’ satisfaction with dental hygiene providers [7–10], and Zimlichman et al. and Bar-Dayan et al. examined military soldiers’ satisfaction with a primary healthcare clinic [11–13]. However, they did not focus on differences in satisfaction between inpatients and outpatients. Considerable differences in treatment measures, standards, time, and environment remain between inpatient and outpatient care. Patients are concerned about different issues when receiving these two types of care. Elucidating factors influencing inpatient and outpatient care separately and analyzing their differences may provide more information for the health system. Military healthcare delivery should include services designed to map various healthcare needs and preferences. We aimed to identify significant factors predicting inpatient and outpatient satisfaction in Chinese military personnel and their relationship.
Method

Study design and setting

The survey was conducted in army establishments in Guangzhou and Hainan provinces. We recruited military personnel, ranging from soldiers to retired cadre, using random sampling. Inpatients were soldiers who had received inpatient care the last year and spent at least 1 night in hospital, while outpatients were those who had received outpatient care within the preceding fortnight and did not stay in the hospital overnight. We endeavored to minimize time-related recall bias because of these restrictive conditions. Patients with no cognitive impairment were eligible to participate.

All participants were assured that their responses would remain anonymous, and surveys did not include participant identifiers. Patients received consent forms, and participation was voluntary. For participants who were younger than 18 years of age, we obtained verbal consent for their participation from their guardians. Because the soldiers were recruited throughout the country, it was almost impossible to obtain written consent during interviews; therefore, we spoke to minors' guardians via telephone and recorded their verbal consent. However, we were unable to contact the guardians of 8 soldiers who were younger than 18 years of age; therefore, we selected another 8 soldiers whose series numbers are next to them. All participants aged 18 years and older were asked to provide written informed consent prior to the initiation of the study. The study complied with all voluntary principles and was conducted in accordance with the Declaration of Helsinki. Ethical approval was granted by the ethics committee at the Second Military Medical University. The consent procedure for the research was also approved by this ethics committee.

Questionnaire design

The questionnaire used to explore soldiers' satisfaction was based on that of the China National Health Service Survey conducted by the China Ministry of Health (now the Health and Family Planning Commission) every 5 years for the past 25 years; results have been applied in Chinese health departments at all levels of scientific management and decision-making. The questionnaire did not include insurance-related questions, as participants were covered by the military healthcare system and were not required to pay for treatment. The questionnaire included 5 sections and 32 items concerning demographic, inpatient, and outpatient characteristics and perception variables for both inpatients and outpatients. In addition, the questionnaire also included a multiple-choice question about reasons of dissatisfaction.

Demographic characteristics. This section contained questions regarding sex, ethnicity, age, and length of military service.

Outpatient characteristics. This section included disease type, severity, illness time, number of days absent, number of treatments, and medical institution.

Inpatient characteristics. This section included operation situation, number of times hospitalized, time waited for hospitalization, time required to reach the medical institution, hospitalization day, and discharge causes.

Perception variables. This section included 4 questions concerning medical and service factors such as satisfaction with medical personnel’s explanation of conditions, satisfaction with doctor’s communication regarding therapeutic regimen, satisfaction with environment, level of trust in medical staff, and overall satisfaction. The inpatient subsection also included satisfaction with medical personnel’s attitudes and medical quality, while the outpatient subsection included satisfaction with healthcare information.

Following careful screening, we distributed 6,238 questionnaires; 6,049 were returned. Only 796 questionnaires were completed by participants who had previously received inpatient or
outpatient care, and 73 of these were considered invalid. Therefore, we analyzed 723 questionnaires including 521 and 248 containing outpatient and inpatient data, respectively (some participants received both types of care). The Response rate is 12.0%.

**Statistical analysis**

To simplify the data analysis, continuous variables were recoded into categorical variables. Descriptive statistics and frequencies were analyzed. Bivariate and multivariate techniques were used to reveal relationships between satisfaction and the variables assessed. SPSS 18.0 for windows was used for all analyses. Data regarding sex were discarded prior to analysis, as all but 7 soldiers were male. Overall satisfaction was a binary variable; therefore, bivariate analysis involved a chi-square test. All associations were considered statistically significant at $p < 0.05$. Due to the limited sample size, bivariate screening was performed to create sparse models with few degrees of freedom.[2] Multivariate analysis involved binary logistic regression. Factors that were statistically significant in the bivariate analysis were analyzed using binary logistic regression to identify significant predictors of military soldiers' satisfaction with inpatient and outpatient care. In the logistic regression, missing data for the 6 perception variables were substituted with average ratings for the respective questionnaire items, to ensure the largest possible dataset for multivariate analysis.[2]

**Results**

The study sample consisted of 521 outpatients and 243 inpatients, all of whom completed the section concerning demographic characteristics. As shown in Table 1, in both inpatients and outpatients, Han was the most prevalent ethnicity, and most patients were aged 21–30 years, while those older than 36 years comprised the smallest group. More than half of the soldiers had served in the army for less than 5 years. Most patients originated from middle and eastern regions. Regarding educational levels, in both groups, more than half of the soldiers had attended technical secondary or senior high school, and many had attended university or junior college. Further, most participants were sergeants or conscripts.

Outpatients' and inpatients' overall satisfaction rates were 19.0% and 18.5%, respectively. Reasons for soldiers’ dissatisfaction were examined in the survey. The main reason for outpatient dissatisfaction was lack of medicine (33.4%), followed by poor service attitude (30.1%) and poor equipment (25.9%). In contrast, the main reason for inpatients’ dissatisfaction was poor service attitude (40.3%), followed by lack of medicine (33.7%) and poor medical technology (32.9%).

Table 1 shows the relationship between overall satisfaction and soldiers’ demographic characteristics. Age, length of military service, educational level, marital status, and staff category were related to outpatients’ overall satisfaction in the bivariate analyses. However, in inpatients, only marital status and staff category were related to overall satisfaction. In outpatients, soldiers aged 16–20 years and those with 1–5 years of military service reported higher satisfaction levels relative to those of other groups. Outpatients with high educational levels were more satisfied relative to other groups. Regarding staff category, the cadetship category in outpatients and the division level or above cadre category in inpatients showed higher overall satisfaction levels relative to those of other groups. Interestingly, in both outpatients and inpatients, married soldiers were less satisfied relative to unmarried soldiers.

Table 2 summarizes the relationships between soldiers’ satisfaction and illness status, outpatient care, and perception variables. Influenza, physical pain, disease severity, illness duration, medical institution, and subjective feeling influenced overall satisfaction. Suffering physical pain reduced overall satisfaction, while patients with influenza reported higher satisfaction.
levels. Patients with mild diseases or illnesses that had lasted for less than a fortnight reported higher satisfaction levels relative to those of other groups. "Receiving clinical care" is related to higher patient satisfaction rate. Patients who responded "yes" or "very good" to perception items, such as satisfaction with healthcare information, satisfaction with doctor’s communication.

### Table 1. The relationship between the overall satisfaction and soldiers demographic characteristic of the outpatient and inpatient.

| Characteristic                  | Total | Satisfied Outpatient (%) | P value | Total | Satisfied Inpatient (%) | P value |
|---------------------------------|-------|--------------------------|---------|-------|--------------------------|---------|
| ethnicity                        |       |                          |         |       |                          |         |
| han                             | 502   | 94 (18.7%)               | 0.408   | 236   | 42 (17.8%)               | 0.085   |
| the other                       | 19    | 5 (26.3%)                |         | 7     | 3 (42.9%)                |         |
| age                             |       |                          |         |       |                          |         |
| 36-                             | 15    | 0                        | <0.0001*** | 6    | 0                        | 0.119   |
| 31–35                           | 51    | 8 (15.7%)                |         | 34    | 6 (17.6%)                |         |
| 26–30                           | 134   | 14 (10.4%)               |         | 62    | 6 (9.7%)                 |         |
| 21–25                           | 240   | 47 (19.6%)               |         | 110   | 24 (21.8%)               |         |
| 16–20                           | 81    | 30 (37.0%)               |         | 31    | 9 (29.0%)                |         |
| length of military service      |       |                          |         |       |                          |         |
| 16-19                           | 19    | 1 (5.3%)                 | <0.0001*** | 11   | 1 (9.1%)                 | 0.100   |
| 11-15                           | 61    | 8 (13.1%)                |         | 38    | 6 (15.8%)                |         |
| 6–10                            | 144   | 13 (9.0%)                |         | 62    | 6 (9.7%)                 |         |
| 1–5                             | 297   | 77 (25.9%)               |         | 132   | 32 (24.2%)               |         |
| home address                    |       |                          |         |       |                          |         |
| East                            | 210   | 37 (17.6%)               | 0.690   | 79    | 15 (19.0%)               | 0.869   |
| Middle                          | 264   | 54 (20.5%)               |         | 108   | 19 (17.6%)               |         |
| West                            | 47    | 8 (17.0%)                |         | 56    | 11 (19.6%)               |         |
| educational level               |       |                          |         |       |                          |         |
| graduate and junior college     | 210   | 30 (14.3%)               | 0.024*  | 89    | 14 (15.7%)               | 0.592   |
| technical secondary school and senior high school | 311 | 69 (22.2%) | 0.003** | 152 | 31 (20.4%) |         |
| junior high school and primarily school | 0  | 0                        |         | 2     | 0                        |         |
| marital status                  |       |                          |         |       |                          |         |
| unmarried                       | 399   | 87 (21.8%)               | 0.003** | 181   | 40 (22.1%)               | 0.018*  |
| married                         | 122   | 12 (9.8%)                |         | 62    | 5 (8.1%)                 |         |
| staff category a                |       |                          |         |       |                          |         |
| retired cadre                   | 1     | 0                        | <0.0001*** | 2    | 1 (50.0%)                | <0.0001*** |
| division level and above cadre  | 2     | 0                        |         | 3     | 2 (66.7%)                |         |
| regimental or below cadre levels | 47  | 4 (8.5%)                 |         | 32    | 2 (6.3%)                 |         |
| Sergeant                        | 323   | 46 (14.2%)               |         | 140   | 15 (10.7%)               |         |
| Conscript                       | 143   | 47 (32.9%)               |         | 62    | 23 (37.1%)               |         |
| Cadetship                       | 5     | 2 (40.0%)                |         | 4     | 2 (50.0%)                |         |
| workplace                       |       |                          |         |       |                          |         |
| urban areas                     | 195   | 44 (22.6%)               | 0.420   | 82    | 23 (28.0%)               | 0.083   |
| rural areas                     | 146   | 25 (17.1%)               |         | 69    | 10 (14.5%)               |         |
| Island                          | 35    | 6 (17.1%)                |         | 13    | 1 (7.7%)                 |         |
| Ship                            | 145   | 24 (16.6%)               |         | 79    | 11 (13.9%)               |         |

*a. from Conscript to division level and above cadre, the military rank rises gradually. Cadetships are the students study in the military school and received the same medical treatment as conscripts. Retired cadre can enjoyed the best medical service in the Chinese military hospital.

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Table 2. The relationship between soldiers’ satisfaction and illness state, received outpatient care and perception variables.

| Type of Diseases | Total | Satisfied Outpatient (%) | P Value |
|------------------|-------|---------------------------|---------|
| influenza        | 188   | 45(23.9%)                 | 0.031*  |
| Fever            | 56    | 10(17.9%)                 | 0.817   |
| Physical pain    | 175   | 23(13.1%)                 | 0.015*  |
| Stomach-ache     | 66    | 10(15.2%)                 | 0.394   |
| Training injury  | 73    | 12(16.4%)                 | 0.547   |
| Others           | 139   | 28(20.1%)                 | 0.689   |
| Disease Severity |       |                           |         |
| Mild             | 107   | 34(31.8%)                 | 0.001** |
| Moderate         | 308   | 50(16.2%)                 |         |
| Serious          | 106   | 15(14.2%)                 |         |
| Illness Duration |       |                           |         |
| Less than fortnight | 267  | 66(24.7%)                 | 0.001** |
| Acute disease happened two weeks before | 51   | 7(13.7%)                  |         |
| Chronic disease happened two weeks before | 203  | 26(12.8%)                 |         |
| The number of days absent |     |                           |         |
| More than 3 days | 0    | 0                         | 0.760   |
| Less than 3 days | 68   | 12(17.6%)                 |         |
| Never            | 453   | 87(19.2%)                 |         |
| The number of treatment |       |                           |         |
| More than 3 times | 391  | 68(17.4%)                 | 0.104   |
| 2 times          | 130   | 31(23.8%)                 |         |
| 1 time           | 0     | 0                         |         |
| Medical Institution |     |                           |         |
| Clinics          | 312   | 69(22.1%)                 | 0.041*  |
| Primary hospital | 63    | 10(15.9%)                 |         |
| Secondary hospital | 76   | 14(18.4%)                 |         |
| Tertiary hospital | 70   | 6(8.6%)                   |         |
| Local hospital and others | 0  | 0                         |         |
| Perception Variables |     |                           |         |
| Satisfaction with healthcare information |     |                           |         |
| Yes              | 276   | 78(28.3%)                 | 0.0001***|
| No               | 136   | 10(7.4%)                  |         |
| Not sure         | 109   | 11(10.1%)                 |         |
| Satisfaction with medical personnel's explanation of condition |     |                           |         |
| Very poor        | 32    | 1(3.1%)                   | 0.0001***|
| Poor             | 41    | 2(4.9%)                   |         |
| Fair             | 297   | 35(11.8%)                 |         |
| Good             | 92    | 31(33.7%)                 |         |
| Excellent        | 59    | 30(50.8%)                 |         |
| Satisfaction with doctor's communication regarding therapeutic regimen |     |                           |         |
| Very poor        | 38    | 1(2.6%)                   | 0.0001***|
| Poor             | 55    | 3(5.5%)                   |         |
| Fair             | 273   | 35(12.8%)                 |         |
| Good             | 99    | 29(29.3%)                 |         |
| Excellent        | 56    | 31(55.4%)                 |         |
| Satisfaction with environment |     |                           |         |

(Continued)
regarding therapeutic regimen, satisfaction with environment, and level of trust in medical staff, reported higher satisfaction levels relative to those of soldiers who responded “no.”

Table 3 shows the relationships between inpatient satisfaction and hospitalization-related factors and perception variables. None of the hospitalization-related factors were related to overall satisfaction. All of the items concerning patients’ subjective views of medical care influenced overall satisfaction.

Table 4 shows the results of the logistic regression analysis. The strongest determinant of outpatients’ overall satisfaction was satisfaction with doctor’s communication regarding therapeutic regimen, followed by length of military service, level of trust in medical staff, and disease severity. The determinants of inpatients’ overall satisfaction included staff category, satisfaction with environment, and satisfaction with medical quality.

**Discussion**

Inpatient and outpatient services differed with respect to treatment measures, standards, time, and environment. Outpatient care is a short-term medical service that does not require an overnight stay in hospital or a medical facility. In contrast, inpatient care involves continuity of care between patients and medical staff, in which inpatients’ perception of the environment and service process is valued. Outpatients’ and inpatients’ overall satisfaction rates were 19.0% and 18.5%, respectively. The overall satisfaction rate was lower relative to those reported in other studies, suggesting that the care provided by the Chinese army does not fulfill soldiers’ health needs. The literature review showed that soldiers’ overall satisfaction rates in previous studies were approximately 90%[16,17], while civilians’ satisfaction varied according to setting. Our survey showed that outpatients complained most about medicine shortages, while inpatients complained about the attitudes of medical staff.
Table 3. The relationship between soldiers satisfaction and the hospitalizations aspect, received inpatient care and perception variables.

| Operation situation         | Total | Satisfied Inpatient (%) | P Value |
|-----------------------------|-------|--------------------------|---------|
| Yes                         | 148   | 26(17.6%)                | 0.785   |
| No                          | 95    | 18(18.9%)                |         |

| Number of times hospitalized | Total | Satisfied Inpatient (%) | P Value |
|------------------------------|-------|--------------------------|---------|
| more than 1 time            | 42    | 10(23.8%)                | 0.291   |
| 1 times                      | 201   | 34(16.9%)                |         |

| Hospitalization day         | Total | Satisfied Inpatient (%) | P Value |
|------------------------------|-------|--------------------------|---------|
| more than 7 days            | 177   | 34(19.2%)                | 0.637   |
| 3–7 days                    | 45    | 6(13.3%)                 |         |
| less than 3 days            | 21    | 4(19.0%)                 |         |

| Time waited for hospitalization | Total | Satisfied Inpatient (%) | P Value |
|---------------------------------|-------|--------------------------|---------|
| more than 1 week                | 23    | 6(26.1%)                 | 0.447   |
| 1 week                          | 220   | 38(17.3%)                |         |

| The time required to research the medical institution | Total | Satisfied Inpatient (%) | P Value |
|-------------------------------------------------------|-------|--------------------------|---------|
| more than 60 minutes                                  | 171   | 36(21.1%)                | 0.066   |
| 30–60 minutes                                         | 72    | 8(11.1%)                 |         |
| 0–30 minutes                                          | 0     | 0                        |         |

| Discharge causes                                      | Total | Satisfied Inpatient (%) | P Value |
|-------------------------------------------------------|-------|--------------------------|---------|
| bad treatment effect                                  | 5     | 1(20.0%)                 | 0.351   |
| poor treatment condition                              | 3     | 0                        |         |
| poor service attitude                                 | 5     | 0                        |         |
| job demand                                            | 13    | 3(20.0%)                 |         |
| self-feeling                                          | 16    | 1(6.3%)                  |         |
| Cured                                                  | 201   | 39(19.4%)                |         |

| Medical institution                                   | Total | Satisfied Inpatient (%) | P Value |
|-------------------------------------------------------|-------|--------------------------|---------|
| Clinics                                               | 19    | 5(26.3%)                 | 0.095   |
| primary hospital                                      | 35    | 8(22.9%)                 |         |
| secondary hospital                                     | 88    | 9(10.2%)                 |         |
| tertiary hospital                                     | 53    | 9(17.0%)                 |         |
| local hospital and others                             | 48    | 13(27.1%)                |         |

| Perception variables                                   | Total | Satisfied Inpatient (%) | P Value |
|-------------------------------------------------------|-------|--------------------------|---------|
| satisfaction with medical personnel's explanation of condition | 7     | 2(28.6%)                | 0.005** |
| very poor                                              | 18    | 1(5.6%)                  |         |
| Poor                                                   | 126   | 16(12.7%)                |         |
| Good                                                   | 56    | 10(17.9%)                |         |
| excellent                                              | 36    | 15(41.7%)                |         |

| satisfaction with doctor's communication regarding therapeutic regimen | Total | Satisfied Inpatient (%) | P Value |
|-----------------------------------------------------------------------|-------|--------------------------|---------|
| very poor                                                              | 7     | 2(28.6%)                | 0.004** |
| Poor                                                                   | 23    | 1(4.3%)                  |         |
| Fair                                                                   | 131   | 17(13.0%)                |         |
| Good                                                                   | 48    | 11(22.9%)                |         |
| excellent                                                              | 34    | 13(38.2%)                |         |

| satisfaction with environment | Total | Satisfied Inpatient (%) | P Value |
|-------------------------------|-------|--------------------------|---------|
| very poor                     | 9     | 1(11.1%)                 | 0.001** |
| Poor                          | 22    | 0                        |         |
| Fair                          | 129   | 19(14.7%)                |         | (Continued)
As shown in the logistic regression analysis results, in both outpatients and inpatients, most demographic characteristics, such as sex, age, ethnicity, home address, educational level, marital status, and workplace, did not remain significant in the logistic regression analysis. This result is consistent with those of previous studies, which showed that the influence of sociodemographic characteristics on patients’ satisfaction was inconsistent. For example, with respect to education levels, Szyca et al. argued that more highly educated patients demonstrated lower expectations and greater satisfaction relative to those who had received less education [18], while Schulmeister et al. held the opposite view [19–23]. However, multivariate analysis identified an association between length of military service and outpatients’ overall satisfaction, while staff category influenced inpatients’ overall satisfaction. Specifically, soldiers in the regimental or below cadre and sergeant categories reported lower satisfaction levels relative to those of other groups. This phenomenon may have resulted from the considerable gap between

**Table 3. (Continued)**

|                     | Total | Satisfied Inpatient (%) | P Value |
|---------------------|-------|-------------------------|---------|
| Good                | 49    | 11(22.4%)               |         |
| excellent           | 34    | 13(38.2%)               |         |
| the level of trust in medical staff |       |                         |         |
| very poor           | 8     | 1(12.5%)                | 0.007** |
| Poor                | 20    | 0                       |         |
| Fair                | 113   | 15(13.3%)               |         |
| Good                | 72    | 19(26.4%)               |         |
| excellent           | 30    | 9(30.0%)                |         |
| satisfaction with medical personnel’s attitudes |       |                         |         |
| not satisfied       | 40    | 1(2.5%)                 | 0.005** |
| satisfied           | 203   | 43(21.2%)               |         |
| satisfaction with medical quality |       |                         |         |
| not satisfied       | 35    | 1(2.9%)                 | 0.010** |
| satisfied           | 208   | 44(21.2%)               |         |

**P<0.01

As shown in the logistic regression analysis results, in both outpatients and inpatients, most demographic characteristics, such as sex, age, ethnicity, home address, educational level, marital status, and workplace, did not remain significant in the logistic regression analysis. This result is consistent with those of previous studies, which showed that the influence of sociodemographic characteristics on patients’ satisfaction was inconsistent. For example, with respect to education levels, Szyca et al. argued that more highly educated patients demonstrated lower expectations and greater satisfaction relative to those who had received less education [18], while Schulmeister et al. held the opposite view [19–23]. However, multivariate analysis identified an association between length of military service and outpatients’ overall satisfaction, while staff category influenced inpatients’ overall satisfaction. Specifically, soldiers in the regimental or below cadre and sergeant categories reported lower satisfaction levels relative to those of other groups. This phenomenon may have resulted from the considerable gap between

**Table 4. Factors associated with overall outpatient satisfaction in the army after logistic regression analysis.**

| Variables                                             | Odd ratio (95% confidence interval) | p Value |
|-------------------------------------------------------|-------------------------------------|---------|
| **Outpatient**                                        |                                     |         |
| length of military service                            | 2.00(1.36–2.92)                     | 0.0001  |
| disease severity                                      | 0.63(0.43–0.94)                     | 0.022   |
| satisfaction with doctor’s communication regarding therapeutic regimen | 2.09(1.50–2.90)                     | 0.0001  |
| the level of trust in the medical staffs              | 1.88(1.80–2.75)                     | 0.001   |
| **Inpatient**                                         |                                     |         |
| staff category                                        |                                     |         |
| regimental or below cadre levels                      | 0.05(0.004–0.58)                    | 0.017   |
| sergeant                                              | 0.08 (0.01–0.69)                    | 0.021   |
| satisfaction with environment                         | 1.69(1.13–2.53)                     | 0.011   |
| satisfaction with medical quality                     | 7.59(1.24–61.16)                    | 0.049   |

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soldiers’ expectations and the care that they received. Expectation has repeatedly emerged as a fundamental factor in satisfaction expression. Patient satisfaction is related to perception of the benefits of care and the extent to which they meet patients’ expectations. Unlike the conscript and cadetship categories, these 2 groups represent military officials who should receive superior and more comprehensive healthcare and insurance protection. However, relative to that of other officials, those in the cadre category received healthcare that was only marginally superior to that of soldiers, and grassroots medical institutions cannot meet their needs, causing embarrassment. Consequently, the healthcare and insurance protection received did not meet their expectations, which led to low satisfaction levels. The influence of length of military service was similar to that of staff category, which influenced soldiers’ perceptions of military health services. Soldiers achieved higher rank and received more advanced and comprehensive care with longer military service, which also led to higher expectations. Imbalanced health resource allocation is inappropriate and unsustainable and cannot maintain soldiers’ health. Additional health resources should be allocated to the grassroots army to improve soldiers’ perceptions of the health service.

Disease severity was an influential factor in overall patient satisfaction. Bredart et al. posited that patients’ judgments regarding care quality depend on their physical conditions. Soldiers with serious diseases were constantly unhappy, which may have led to pain and distrust of medical personnel. In contrast, patients are more familiar with mild diseases, such as influenza, and they demonstrate reasonable expectations concerning the disease and optimistic attitudes towards their treatment. These factors are all vital to overall satisfaction. It is worth noting that the medical institution factor was removed from the multivariate analysis. In China, hospitals were categorized according to their functions, equipment, and technology levels. From clinics to tertiary hospitals, medical resources and diagnosis and treatment levels increased considerably. There are strict medical service rules in place for treatment provided to soldiers, which stipulate that they are supposed to receive medical services first from primary military medical institutions and then to advanced military hospitals. In some situations, they receive local, rather than military, medical services. The evaluation of medical services is always based on service quality, environment, and equipment. A number of important factors that influence patient satisfaction, such as surroundings and medical service quality, have been analyzed individually. Therefore, the medical institution factor was eliminated from the multivariate analysis.

It is noteworthy that perception variables exerted a strong influence on overall satisfaction in both inpatients and outpatients. In the literature review, patient satisfaction was associated with decisionmaking, clinicians’ communication, treatment outcomes, patients’ expectations and therapeutic listening. In the present study, military outpatient valued trust and communication with medical staff. Previous studies have emphasized the importance of communication. This is congruent with our findings. To some extent, medical treatment is both a product provided by health institutions and a service enjoyed by patients. Consequently, patients valued both care quality and their perceptions regarding outpatient care. Efficient communication between medical personnel and patients increases their positivity regarding care and establishes doctor-patient relationships, which can reduce patients’ anxiety. This relationship was the foundation of patients’ trust in medical staff, which could have influenced their satisfaction levels. In contrast, patients obtained information concerning their diseases and treatment via communication with medical staff, particularly in outpatient care. These results indicated that efficient communication improved patients’ perceptions of care and led to high satisfaction ratings. Unfortunately, this communication is neglected in healthcare settings, evoking violence and conflict between doctors and patients. In addition, patients’ trust in medical staff was also a factor influencing outpatients’ overall satisfaction. As mentioned previously, patients’ trust in medical staff and facilities affects their attitudes and cooperation.
during treatment. All of these factors could promote patients’ recovery and increase their satisfaction. Medical personnel should enhance communication with soldiers and provide clear treatment information. Most injured soldiers are young and far from their parents. Contact with doctors and nurses is more than a simple medical relationship and constitutes a spiritual refuge for soldiers who have experienced intensive training and suffered emotional loneliness.

Hospitalization is highly stressful, and the related health service use constitutes a long-term experience rather than single, short-term event. Multivariate analysis showed that environment and medical treatment quality strongly influenced inpatients’ overall satisfaction, which differed significantly from that of outpatients. Soldiers are inpatients only when seriously injured, which affects their training and faith. Undoubtedly, healthcare quality is important in patients’ perceptions of care, particularly those using inpatient medical services. Traditionally, clinicians’ technical competence and mechanical precision are important factors in overall satisfaction assessment. Unlike that of inpatient care, the quality of outpatient care is not observed immediately subsequent to treatment. However, inpatients are discharged only after they have received appropriate care and substantial symptom relief. Consequently, inpatient medical treatment quality was a primary factor when patients appraised the medical services received. Furthermore, environment is also an important factor in soldiers’ overall satisfaction. To some extent, the hospital is type of hotel in which patients reside when they are ill. The comfort of their surroundings could exert a strong influence on patients’ emotion and satisfaction, particularly for soldiers. In addition, the health institution’s environment reflects the scale and capacity of the department, which affects soldiers’ perception of hospitalization. Clinics and primary hospitals should provide comfortable environments, which could offset nervousness and uneasiness in soldiers who are alone in hospital.

The study was subject to some limitations. Because data were collected from soldiers in Hainan and Guangdong provinces, the representativeness of the findings is limited. Future research should include larger sample sizes and armies from different military regions. Moreover, participants were recruited from troops. If the study had been conducted in the hospital immediately following treatment, the sample could have been larger and recall bias minimized. Further, the data source was a self-report questionnaire. An objective scale and diagnosis or treatment information from hospitals’ patient databases would have been more precise. Despite these limitations, the study provided important information regarding inpatient and outpatient satisfaction in the Chinese army. It was the first study to explore factors influencing Chinese soldiers’ satisfaction with care, which could contribute to health system reform in China. Soldiers’ health was directly related to troops’ daily training and fighting capacity. Exploring the causes of satisfaction and dissatisfaction with military health institutions is important in the fulfillment of their responsibility to maintain soldiers’ health.

Conclusion

Soldiers’ health status is directly related to troops’ daily training and fighting capacity. Exploring the causes of satisfaction or dissatisfaction with military health institutions is important in ensuring that military health institutions fulfill their responsibility to maintain soldiers’ health. Bivariate and multivariate techniques were used to reveal the relationship between satisfaction and assessed variables. Outpatient satisfaction was related to doctor-patient communication concerning the therapeutic regimen, length of military service, levels of trust in medical staff, and the severity of disease. In contrast, inpatient satisfaction was associated with staff category, satisfaction with the environment, and satisfaction with medical quality. Health resource location reform, communication enhancement, and environment improvement are essential in increasing satisfaction.
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Author Contributions

Conceived and designed the experiments: Y. Lv CX YG LZ. Performed the experiments: Y. Lv CX YG FY XL Y. Liu. Analyzed the data: Y. Lv CX. Contributed reagents/materials/analysis tools: Y. Lv FY. Wrote the paper: Y. Lv CX YG.

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