Prevalence and Characteristics of Chronic Pain in the Chinese Community-dwelling Elderly: A Cross-sectional Study.

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Abstract

Background: Chronic pain has adverse impacts on health and daily life in the elderly. Gaining insight into chronic pain that affects the Chinese community-dwelling elderly is important for pain management in China, which possesses the largest elderly population in the world.

Methods: This was a cross-sectional design that followed the STROBE Guideline. A randomized cluster sampling method was used to recruit participants in the Sichuan Province from Dec 2018 to May 2019. Face-to-face interviews were performed in order to collect socio-demographic data, characteristics and health seeking behaviors of chronic pain through a self-designed questionnaire.

Results: A total of 1,381 older adults participated in this study. Among these participants, 791 (57.3%) had chronic pain. Here, prevalence and pain intensity were both found to increase from the 60-69 group to the 70-79 group, which then decreased in the ≥80 group with no significant differences in sex (p>0.05). The most common pain locations were observed to be in the legs/feet (53.5%), head (23.6) and abdomen/pelvis (21.1%). Among the elderly suffering from chronic pain, only 29.4% sought medical help while 59.2% received medication and 59.7% adopted non-drug therapy.

Conclusion: Chronic pain is a common health concern in the Chinese community-dwelling elderly, which possesses different characteristics compared to populations from other countries. In this regard, easier access to medication assistance and provision of scientific guidance for non-drug therapy may serve as satisfactory approaches in improving pain management.

Background

The International Association for the Study of Pain (IASP) has defined chronic pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, which may also be described in term of such damage lasting for over 3 months [1]. As the population continues to age, a rise in prevalence for chronic and degenerated diseases is inevitable, which eventually leads to a high incidence of chronic pain in the elderly [2, 3]. Previous studies have investigated the incidence of chronic pain in the elderly, showing a prevalence ranging from 43.8–55.2% in elderly people residing in the east [4–7], being 40–66% prevalent in elderly people residing in the west [8, 9].

Chronic pain affirmatively impairs the health status and daily life of the elderly. Previous studies have found that chronic pain impairs the activities of daily living [10, 11], dignity [12], sleep quality [13] and quality of life [14]. Chronic pain was also reported to cause social isolation, fatigue and depression in the elderly [8, 15]. Moreover, chronic pain can increase the utilization of medical resources of society as well as the healthcare costs of individuals [14, 16]. Despite a series of studies have been conducted on chronic pain in the elderly, the prevalence and impacts of chronic pain in the elderly remain underestimated. Pain is always a recognized feature of old age to both physicians and caregivers [17]. In terms of the elderly, nociception may change with aging, and the affected elderly become accustomed to living with chronic pain, causing them not report their pain or seek medical attention [18]. Of course, the elderly populations in different cultures have different pain expression capacities that influences the results of the corresponding studies [19]. Hence, it is necessary to
gain insight into the prevalence of chronic pain in the elderly according to different cultural and economic backgrounds.

Chronic pain also serves as a major health problem in China as the country possesses the largest number of the elderly in the world. According to the National Bureau of Statistics of China, the proportion of people aged 60 years and above had reached 16% in 2015 [20]. Thus, researchers have conducted studies to investigate the prevalence of chronic pain in the Chinese elderly. Xue, Chu [21] investigated the prevalence of chronic pain in the elderly in those aged 80 years and above in four provinces in China, which found that 76.4% of participants suffered from chronic pain. Additionally, Wang, Xu [22] conducted a survey in elderly inpatients and reported that 55.5% of elderly inpatients had chronic pain. Accordingly, studies focusing on community-dwelling elderly mainly reported on the prevalence of chronic pain rather than on characteristics like interference with daily life, health seeking behaviors or conditions of medication use among the corresponding elderly [6, 23]. The aforementioned studies focused on specific subpopulations or prevalence of chronic pain that had limited insights into chronic pain.

Understanding the entire picture of chronic pain, including its prevalence, characteristics, pain-related health seeking behaviors in community-dwelling elderly is crucial for policy making and chronic pain management. Thus, this study aimed to investigate the prevalence, characteristics and pain-related health seeking behaviors due to chronic pain in the elderly in China.

**Objectives**

This study aimed to investigate the prevalence, characteristics and pain-related health seeking behaviors in the Chinese community-dwelling elderly.

**Methods**

**Study design**

This was a cross-sectional study that followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement.

**Setting**

This study was conducted in the Sichuan Province in west China from Dec 2018 to May 2019, where people aged 60 years old or above has exceeded 9% of the population.

**Participants**

The participants in this study were recruited through two stages. First, from 21 cities/autonomous prefectures in Sichuan Province, seven cities/autonomous prefectures were selected according to their socioeconomic status (Chengdu City, Luzhou City, Zigong City, Neijiang City, Nanchong City, Ganzi Autonomous Prefecture and Mianyang City). Second, a random cluster sampling method was used to recruit participants from 8 communities from the selected cities/autonomous prefectures. The inclusion criteria were: participants aged 60 years old over above and those who agree to participate in the study. The exclusion criteria were having
difficulties in communication and psychological diseases. The expected prevalence of chronic pain was set as 49.8%, according to a recent study in China [6]. A sample size of 1152 was calculated using the formula:

$$Z^2_{\alpha/2} p (1 - p) \text{DEFF} / d^2$$

in which $$\alpha = 0.05$$, $$p = 0.498$$, DEFF = 3, $$d = 0.05$$ [24]. In order to compensate for potential mistakes and missing values (10%), the final sample size was 1,267 participants. This study was approved by the Ethnic Committee of Chengdu University.

Data collection

A trained research assistant completed the face-to-face interviews. First, the research assistant explained the purpose and procedure of the study and obtained the participants’ written informed consent. Then, the research assistant conducted an investigation for about 30 minutes in a quiet room in the community hospital by the questionnaire developed for this study to collect socio-demographic data (age, sex, education level, living status, marital status, monthly income and comorbidities), characteristics of chronic pain (pain location, intensity, interference with daily life and precipitating factors), health seeking behaviors (usage of medication and non-drug therapy) and self-rated health. The completeness of the collected data was checked by the author after completing the interviews in each single community.

Measurements

Chronic pain

Chronic pain was measured by asking two questions: (1) “Did you have a pain experience?”; (2) “If yes, how long did you get the pain?”. In this study, pain lasting $$\geq$$ 3 months was defined as chronic pain following the IASP classification. Moreover, if participants experienced chronic pain, the pain location (eight locations based on a study from Mccarthy, Bigal [25]), precipitating factors for pain, usage of medication and non-drug therapy were also questioned and recorded.

Pain intensity

Pain Severity Subscale of the Brief Pain Inventory (BPI) [26] was used to evaluate pain intensity. This subscale is recommended for elderly pain assessment as it evaluates overall pain rather than site-specific pain [27]. Participants were asked to rate the severity of pain in the last week according to four aspects (worst pain, least pain, pain on average and pain right now) according to an 11-point numeric rating scale. The “0” indicated “no pain” while “10” indicated “severe or excruciating pain you cannot imagine”. A higher score signified more severe pain. This subscale has good internal consistency with a Cronbach’s alpha coefficient of 0.84 [28].

Interference of pain with daily life

In this study, interference of pain with daily life was evaluated using a single pain interference subscale extracted from BPI. This pain interference subscale consisted of seven items: general activity, mood, walk, working, relationship, sleep and enjoyment. Participants were asked to rate the degree of interference with daily life using an 11-point numeric rating scale, with “0” indicating “no interference” and “10” indicating “interference cannot tolerate”. The pain interference subscale also had good internal consistency with a Cronbach’s alpha coefficient of 0.94 [28].

Self-rated health
A single question was asked in order to assess the participants’ self-rated health status. The responses were “very bad”, “bad”, “general”, “good” and “very good”, for which participants had to choose a single option.

**Data analysis**

The descriptive statistics were displayed using the appropriate methods. The Chi-square test, Mann-Whitney U test, Kruskal-Wallis H test and ANOVA were used to compare the differences between different groups. Student-Newman-Keuls test and Bonferroni correction method were used to compare groups in pairs where three or more groups were compared. All data analyses were performed in SPSS 23.0 (Chicago, SPSS Inc).

**Results**

**Socio-demographic data and prevalence of chronic pain of participants**

A total of 1,450 elderly individuals satisfied the inclusion criteria, and 1,403 of them agreed to participate in this study. Finally, 22 did not complete the interview, and 1,381 participants were finally enrolled. The participants mainly consisted of females (55.3%) and elderly aged from 60 to 69 years old (45.1%). The elderly participants with no education made up 26.1% of all participants. Most participants were located in urban areas (71.7%) and suffered from comorbidities (92.5%). Over 10% of participants only had a monthly disposable personal income of under 275 RMB. Table 1 shows the detailed data of participants with and without chronic pain. Among all samples, 791 participants suffered from chronic pain (57.3%). Participants living in rural areas, having lower monthly disposal personal income and comorbidities were more likely to have chronic pain ($p < 0.01$).
Table 1
Socio-demographic data of participants with or without chronic pain (N = 1381)

| Characteristics          | Total (N=1381) | Chronic pain (N=791) | No chronic pain (N=590) | $\chi^2/Z$ | P value |
|--------------------------|----------------|----------------------|-------------------------|------------|---------|
| Sex                      |                |                      |                         |            |         |
| Male                     | 617 (44.7)     | 339 (42.9)           | 278 (47.1)              | 2.483      | 0.115   |
| Female                   | 764 (55.3)     | 452 (57.1)           | 319 (52.9)              |            |         |
| Age                      |                |                      |                         |            |         |
| 60-69                    | 623 (45.1)     | 357 (45.1)           | 266 (45.1)              | -0.42      | 0.675   |
| 70-79                    | 541 (39.2)     | 302 (38.2)           | 239 (40.5)              |            |         |
| ≥80                      | 217 (15.7)     | 132 (16.7)           | 85 (14.4)               |            |         |
| Marital status           |                |                      |                         |            |         |
| Married                  | 1023 (74.1)    | 594 (75.1)           | 429 (72.1)              | 3.104      | 0.212   |
| Divorced/Widowed         | 256 (18.5)     | 147 (18.6)           | 109 (18.5)              |            |         |
| Unmarried                | 102 (7.4)      | 50 (6.3)             | 52 (8.8)                |            |         |
| Education level          |                |                      |                         |            |         |
| Illiteracy               | 360 (26.1)     | 225 (28.4)           | 135 (22.9)              | 5.502      | 0.064   |
| Primary                  | 494 (35.8)     | 276 (34.9)           | 218 (36.9)              |            |         |
| Secondary or above       | 527 (38.1)     | 290 (36.7)           | 237 (40.2)              |            |         |
| Residence location       |                |                      |                         |            |         |
| Urban area               | 990 (71.7)     | 527 (66.6)           | 463 (78.5)              | 23.38      | <0.001  |
| Rural area               | 391 (28.3)     | 264 (33.4)           | 127 (21.5)              |            |         |
| Living alone             |                |                      |                         |            |         |
| Yes                      | 129 (9.3)      | 69 (8.7)             | 60 (10.2)               | 0.835      | 0.361   |
| No                       | 1252 (90.7)    | 722 (91.3)           | 530 (89.8)              |            |         |
| Monthly DPI (RMB)        |                |                      |                         |            |         |
| <275                     | 188 (13.6)     | 139 (17.6)           | 49 (8.3)                | -6.691     | <0.001  |
| 275-1700                 | 449 (32.5)     | 283 (35.8)           | 166 (28.1)              |            |         |
| ≥1700                    | 744 (53.9)     | 369 (46.6)           | 375 (63.6)              |            |         |

Comorbidity

DPI: disposable personal income
Table 2 displays pain intensity and pain location of participants with chronic pain. There were no significant differences in pain intensity between male and female participants regardless of worst pain, least pain, pain on average and pain right now ($p > 0.05$). Participants in the 70–79 age group had significantly higher worst pain compared to both the 60–69 and $\geq 80$ age groups ($p < 0.05$). Participants in the 60–69 age group had significant lower least pain and pain on average compared to the other two groups ($p < 0.05$). Participants in the 60–69 age group had significant lower pain right now compared to the 70–79 group ($p < 0.05$). The most common pain locations were found to be in the legs/feet (53.3%), head (23.6%) and abdomen/pelvis (21.1%). Females had a significantly higher incidence of neck/shoulder and legs/feet pain than males (22.6% vs 14.5%, $p < 0.01$; 58.8% vs 48.7%, $p < 0.01$). Participants in the $\geq 80$ age group significantly reported less neck/shoulder pain compared to both the 60–69 and 70–79 age groups ($p < 0.05$). Furthermore, participants in the 70–70 age group had significantly more legs/feet pain ($p < 0.05$).
Table 2
Characteristics of chronic pain according to age and sex (N = 791)

| Characteristics | Total | Male(N=339) | Female(N=452) | 60-69 (N=357) | 70-79 (N=302) | ≥80 (N=132) |
|-----------------|-------|-------------|---------------|----------------|----------------|-------------|
| Pain intensity  |       |             |               |                |                |             |
| Worst pain      | 5.6±2.2 | 5.6±2.2 | 5.5±2.2 | 5.2±2.2 | 6.0±2.2 | 5.6±2.3**† |
| Least pain      | 2.2±1.8 | 2.2±1.9 | 2.2±1.7 | 1.9±1.6 | 2.5±2.0 | 2.3±1.8**† |
| Pain on average | 3.7±1.7 | 3.7±1.8 | 3.6±1.7 | 3.3±1.5 | 4.2±1.9 | 3.9±1.7**† |
| Pain right now  | 2.9±2.0 | 2.9±2.1 | 3.0±1.9 | 2.7±1.8 | 3.2±2.1 | 2.9±2.0**† |
| Pain location   |       |             |               |                |                |             |
| Head            | 187(23.6) | 85(25.1) | 102(22.6) | 91(25.5) | 72(23.8) | 24(18.2) |
| Face            | 26(3.3) | 15(4.4) | 11(2.4) | 8(2.2) | 12(4.0) | 6(4.5) |
| Neck/shoulder   | 151(19.1) | 49(14.5) | 102(22.6)** | 80(22.4) | 59(19.5) | 12(9.1)**‡ |
| Back            | 114(14.4) | 42(12.4) | 72(15.9) | 42(11.8) | 49(16.2) | 23(17.4) |
| Arms/hands      | 149(18.8) | 55(16.2) | 94(20.8) | 71(19.9) | 63(20.9) | 15(11.4) |
| Legs/feet       | 431(53.5) | 165(48.7) | 266(58.8)** | 177(49.6) | 182(60.3) | 72(54.5)**‡ |
| Chest           | 124(15.7) | 62(18.3) | 62(13.7) | 57(16.0) | 45(14.9) | 22(16.7) |
| Abdomen/pelvis  | 167(21.1) | 82(24.2) | 85(18.8) | 80(22.4) | 62(20.5) | 25(18.9) |

†: Student-Newman-Keuls; ‡: Bonferroni correction; **: p < 0.01; *: p < 0.05;

Impact of chronic pain on daily and self-rated health

Table 3 illustrates interference with daily life of chronic pain and self-rated health in participants with chronic pain. The most affected aspects of daily life were sleep (3.9±2.6), general activity (3.7±2.4) and walking (3.6±2.6). Participants in the 60–69 age group had significantly lower general activity, mood, walking, relationship and sleep score compared to the other two groups (p < 0.05). Moreover, participants in the 70–79 age group had significantly higher working scores compared to the other two groups (p < 0.05). Participants in the 70–79 age group had significantly higher enjoy scores compared to the 60–69 age group (p < 0.05). A total of 234 (29.6%) participants reported bad health conditions. Additionally, the proportion of participants with bad health was found to increase with aging.
Table 3  
Impact of chronic pain on daily life and self-rated health according to age

| Items          | Total  | 60-69 (N=357) | 70-79 (N=302) | ≥80 (N=132)  | F/H   | P value |
|----------------|--------|----------------|----------------|--------------|-------|---------|
| Daily activity |        |                |                |              |       |         |
| General activity | 3.7±2.4 | 3.3±2.2        | 4.2±2.5        | 3.9±2.5      | 25.793† | <0.001  |
| Mood           | 3.5±2.4 | 3.0±2.1        | 3.9±2.5        | 3.6±2.3      | 26.907† | <0.001  |
| Walk           | 3.6±2.6 | 3.0±2.3        | 4.1±2.7        | 4.3±2.8      | 40.149† | <0.001  |
| Working        | 1.4±2.2 | 1.2±1.9        | 1.8±2.5        | 1.2±2.1      | 9.014†  | 0.011   |
| Relationships  | 2.7±2.3 | 2.3±2.1        | 3.1±2.6        | 2.9±2.4      | 14.579† | 0.001   |
| Sleep          | 3.9±2.6 | 3.6±2.5        | 4.3±2.7        | 4.1±2.7      | 6.919†  | 0.001   |
| Enjoy          | 3.0±2.4 | 2.6±2.1        | 3.4±2.5        | 3.0±2.4      | 15.371† | 0.001   |
| Self-rated health |        |                |                |              |       |         |
| Very bad       | 33 (4.2) | 11 (3.1)       | 13 (4.3)       | 9 (6.8)      | 17.265 | <0.001  |
| Bad            | 201 (25.4) | 67 (18.8)      | 90 (29.8)      | 44 (33.3)    |       |         |
| General        | 331 (41.8) | 161 (45.1)     | 123 (40.7)     | 47 (35.6)    |       |         |
| Good           | 91 (11.5) | 48 (13.4)      | 28 (9.3)       | 15 (11.4)    |       |         |
| Very good      | 135 (17.1) | 70 (19.6)      | 48 (15.9)      | 17 (12.9)    |       |         |

†: Student-Newman-Keuls;

**Excepted precipitating factors for chronic pain**

The excepted precipitating factors for chronic pain were displayed in Table 4. Up to 35.5% of chronic pain was precipitated by chills, while 32.1% of chronic pain was precipitated by excessive fatigue. Humidity was also a common precipitating factor for chronic pain (19.7%). Moreover, over one-third (37.3%) of chronic pain was precipitated by unspecific factors.
Table 4
Excepted precipitating factors of chronic pain (N = 791)

| Factors         | Frequency | Percentage |
|-----------------|-----------|------------|
| Excessive fatigue | 254       | 32.1       |
| Chill           | 281       | 35.5       |
| Humidity        | 156       | 19.7       |
| Life event      | 39        | 4.9        |
| Bad mood        | 44        | 5.6        |
| Unspecific factors | 295       | 37.3       |

Health seeking behaviors of participants with chronic pain

Table 5 displays the health seeking behaviors of participants with chronic pain. Only 29.4% of participants had asked for medical help, and most (44.4%) chose to handle the pain by themselves. Moreover, up to 40.8% of participants with chronic pain did not receive medication. The medication use rate in rural areas was found to be significantly higher than that in urban areas ($p < 0.001$). The most popular non-drug therapies adopted were massages (21.4%), hot/cold compresses (16.4%) and acupuncture (13.8%). Those living in urban areas significantly intended to take acupuncture, cupping therapy, electrical stimulation and massage to cope with chronic pain compared to the participants in rural area.
Table 5
Health seeking behaviors and medication use of participants with chronic pain (N = 791)

| Items                      | Total  | Residence location | $\chi^2$ | $P$ value |
|----------------------------|--------|--------------------|----------|-----------|
|                            |        | Urban (N=527)      | Rural (N=264) |          |
| Health seeking             |        |                    |          |           |
| Enduring                   | 207(26.2) | 138(26.2) | 69(26.1) | 1.485 | 0.467 |
| Handling by oneself        | 351(44.4) | 227(43.1) | 124(47.0) |        |       |
| Seeking for medical help   | 233(29.4) | 162(30.7) | 71(26.9) |        |       |
| Medication use             |        |                    |          |           |
| Yes                        | 468(59.2) | 281(53.3) | 187(70.8) | 22.308 | <0.001 |
| No                         | 323(40.8) | 246(46.7) | 77(29.2) |        |       |
| Non-drug therapy adopted   |        |                    |          |           |
| No                         | 319(40.3) | 200(38.0) | 119(45.1) | 3.711 | 0.054 |
| Yes                        | 472(59.7) | 327(62.0) | 145(54.9) |        |       |
| Acupuncture                | 109(13.8) | 84(15.9) | 25(9.5) | 6.196 | 0.013 |
| Cupping therapy            | 71(9.0) | 55(10.4) | 16(6.1) | 4.122 | 0.042 |
| Electrical stimulation     | 48(6.1) | 46(8.7) | 2(0.8) | 19.606 | <0.001 |
| Massage                    | 169(21.4) | 133(25.2) | 36(13.6) | 14.089 | <0.001 |
| Distraction                | 43(5.4) | 33(6.3) | 10(3.8) | 2.094 | 0.148 |
| Hot/cold compress          | 130(16.4) | 80(15.1) | 50(18.9) | 1.81 | 0.179 |
| Others                     | 31(3.9) | 25(4.7) | 6(2.3) | 2.852 | 0.091 |

Discussion

In this cross-sectional study, we learned the basic characteristics of chronic pain in the elderly community in Sichuan Province: 57.3% of community-dwelling older adults residing in west China were found to have chronic pain, which was mostly precipitated by chills and excessive fatigue. In addition, elderly individuals aged 60–69 years old were more likely to have mild pain. The first three common pain locations were observed to be in the legs/feet, head and abdomen/pelvis. The most affected aspect of daily life due to
chronic pain was sleep. Moreover, elderly aged between 60–69 years old were less affected by chronic pain according to general activity, mood, walk, relationship and sleep. Nearly half of those with chronic pain did not use medication, and over half adopted non-drug therapy.

Surprisingly, the prevalence of chronic pain in this study was found to be significant higher than previous studies conducted by Li, Chen [6] and Si, Wang [23], which respectively reported that the prevalence of chronic pain in Chinese community-dwelling elderly were 49.8% and 41.1%. The reasons for why the prevalence was higher in this study may be the gap of economic and medical resource between East China and West China. As we can see, Li, Chen [6] and Si, Wang [23] both recruited participants from East China whose economic and medical resources are much better than that of west China, and economic status was previously observed to influence the incidence of chronic pain [29]. Moreover, Si, Wang [23] only investigated samples from the capital city owning the best economic and medical resources in Shandong Province, which could lead to a lower incidence of chronic pain.

Interms to sex, most previous studies revealed that females were more likely to have chronic pain [8, 9, 23, 30], which was inconsistent with this study. It is generally believed that females are more sensitive to pain due to their unique biological or psychological mechanisms [31, 32]. Moreover, females usually live longer than males, hence, the difference increases with aging. In this respect, this study did not find any differences in the prevalence of chronic pain according to sex, highlighting that regional and cultural differences may need to be taken into account when the relationship between sex and chronic pain be examined.

As can be seen from the data in this study, pain intensity did not increase with aging and decreased after 80 years of age. Other studies have also found a decrease in pain prevalence with age up to 85 years[33, 34], which may be related to the decreased perception of pain caused by sensory dysfunction in people over 80 years old.

This study found that elderly living with lower monthly disposable personal incomes had a higher prevalence of chronic pain, which has been confirmed by other studies[4, 35, 36]. Socioeconomic factors have been associated with worse health outcomes, for those living in poverty, low incomes haunt each financial decision, and many are unable to consistently afford prescribed interventions such as medications and ongoing visits to health care providers to manage their health[37]. Therefore, it is important for policy makers to pay more attention to the elderly population.

In our study, significant relationship between the prevalence of chronic pain and education level had not been seen, which was inconsistent with previous studies that reported a lower level of education indicated a higher incidence of chronic pain [23, 30]. They believed that patients with low education level may delay the visit or treatment due to insufficient health awareness, who fail to treat chronic pain-related illnesses early[38]. Therefore, the results of this study may imply that older people with higher education in western China still lack sufficient health awareness. However, there was also a point of view that a higher prevalence of chronic pain was observed in elderly with a lower level of education, which may be associated with the wrong perception that chronic pain are due to low education levels rather than low socio-economic status [30].

This study also found that elderly living in rural areas had a lower prevalence of chronic pain, it was not consistent with earlier findings that older people living in poorer neighborhoods are more likely to suffer from
chronic pain[37, 39]. As was known to all, the economic conditions and medical conditions in urban areas are better than those in rural areas in western China, the reason for this paradoxical result may be because older people living in cities have a modern way of life, which is not healthy and leading to increased risk for kinds of chronic disease including chronic pain[40]. Studies have shown that the health care costs was higher in developed cities[41], which may lead to the lack of treatment for pain due to the heavy economic burden of disease treatment in some elderly people.

In this study, the most common pain locations were found to be in the legs/feet, head and abdomen/pelvis. The ranking of the reported pain locations was observed to vary greatly across different studies. For example, Korean elderly individuals most frequently reported back pain [42]. Moreover, elderly from the UK and Spain mostly reported lower limb pain [43, 44], while the Polish elderly mainly suffered from pain in their lumbar regions [17].

In regard to interference with daily life, chronic pain was found to interfere with it mainly in sleep, general activity and walk in this study. Si, Wang [23] also found a strong association between sleep disturbance, decreased physical activity and chronic pain in the elderly, which may be due to functional changes in the nervous system, where pain and sleep are both modulated due to long-term chronic pain [45]. It was previously found to be necessary to focus on the sleep quality of elderly with chronic pain. In terms of activity, fear of pain made them avoid exercising, daily selfcare, even any move. [46], which could endanger their independence and quality of life, with reduced levels of fitness and function leading to increased levels of disability[47]. Therefore, it is important for health care providers to educate older people to maintain and increase physical activities.

Unsurprisingly, only 29.4% of participants in this study actively sought medical help, and over 40% did not receive medication. The corresponding result was similar to that of Liberman, Freud [48], who reported that only 41.1% of elderly used medication. However, over half of participants in this study adopted non-drug therapies such as massages, hot/cold compresses, and acupuncture, which may have reduced the medication use rate, especially in elderly living in urban areas. Thus, providing easy access to medication assistance and scientific non-drug therapy guidance to elderly suffering from chronic pain may benefit and improve pain management.

There were some limitations in this study. First, this was a cross-sectional study conducted in west China, where economic and medical statuses differed from other parts of China. Thus, the representativeness of the sample was limited because the prevalence and characteristics of chronic pain were influenced by economic and medical resources. Second, precipitating factors and medication use for chronic pain may vary according to the different biological or pathological characteristics of chronic pain. In this study, we could not verify these variations, hence, researchers should be cautious in generalizing the results of the precipitating factors, pain locations and medication use conditions.

**Conclusion**

Chronic pain is a common health concern in the Chinese community-dwelling elderly with a prevalence of 57.3%. The prevalence and intensity of chronic pain did not increase with aging and showed no differences
with respect to sex. Pain in the legs/feet was the most reported pain location in both males and females. Furthermore, easier access to medication assistance and scientific guidance for non-drug therapy may be helpful in improving pain management in this population.

**Abbreviations**

IASP  
International Association for the Study of Pain.  
STROBE  
Strengthening the Reporting of Observational Studies in Epidemiology.  
BPI  
Brief Pain Inventory.  
RMB  
Renminbi.  
DPI  
disposable personal income.  
UK  
United Kingdom.

**Declarations**

**Ethics approval and consent to participate**

The study procedure was approved by the the Ethnic Committee of Chengdu University. Written informed consent was obtained from all participants before they took part in the study, and all participants were informed that they have the right not to participate in the study. All information obtained in the study was kept confidential.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The data that supports the findings in this study can be made available through contacting the corresponding author under reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

**Funding**

Not applicable.
Authors’ Contributions

JL and XL developed the proposal and designed the protocol, WZ were involved in revising the proposal and design. XL WZ and CH were involved in data collection, and analysis. XL and WZ drafted the manuscript. JL and FY revised the analysis and helped in the preparation of the manuscript. All the authors have read and approved the final version of the manuscript.

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