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Influencing Factors of Knowledge, Belief and Action in the Prevention of Cervical Spondylosis in Guangxi University Students

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Abstract: This study, based on the Knowledge, Attitude, and Practice (KAP) theoretical framework, aimed to understand the current state of cervical spine sub-health among college students in Guangxi and to explore their cognition, attitudes, behaviors, and influencing factors regarding cervical spondylosis prevention. The goal was to develop more targeted and effective interventions to reduce the occurrence of cervical spondylosis in this population. A questionnaire was designed based on the KAP framework and tailored to the characteristics of the survey subjects. Its reliability and validity were evaluated. Among the 343 Guangxi college students surveyed, 44.3% were found to be in a sub-healthy cervical spine state, while only 55.1% had a healthy cervical spine. The total KAP score reached 70.00, indicating a moderate overall level. The knowledge dimension scored 79.17, generally at the upper-middle level. The attitude dimension scored 80.00, also in the upper-middle range, while the behavioral dimension scored 46.67, indicating a generally low level of behavior. Given the numerous factors influencing cervical spondylosis prevention among Guangxi college students, a multi-factor treatment approach is necessary. It is recommended to establish a three-pronged prevention mechanism involving the government, individuals, and schools.

Keywords: University student; Cervical spondylosis prevention; Influencing factors; Know, believe and act

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1. Introduction

With the advancement of science and technology and changes in lifestyle, prolonged work hours, shifts in leisure and entertainment methods (such as increased use of computers and mobile phones), and excessive reliance on air conditioning have significantly increased exposure to wind, cold, and humidity. These factors have contributed to a rising incidence of cervical spondylosis, which is increasing year by year and affecting younger individuals,

particularly college students and adolescents [1–3]. Cervical spondylosis not only undermines the physical and mental health of college students but also hinders sustainable societal development. A healthy body is the cornerstone of life and work, making the prevention of cervical spondylosis among college students particularly crucial [4,5]. Cervical spine sub-health refers to the presence of one or more noticeable symptoms of various types of cervical spondylosis that affect study, work, and daily activities. However, there are no significant organic lesions, and the condition can recover with rest or lifestyle changes, leaving no sequelae [6,7].

1.1. Cervical spondylosis concept in China

Cervical spondylosis (CS), also known as cervical spine syndrome, refers to a group of clinical syndromes caused by chronic cervical strain, acute trauma, and age-related degeneration of intervertebral discs and vertebral joints. These conditions can affect surrounding tissues, including the neck's soft tissues, leading to various clinical symptoms. As a common and prevalent condition, cervical spondylosis affects 3.8% to 17.6% of the population and is increasingly seen in younger individuals. A study found that 29.1% of primary and secondary school students had cervical spine abnormalities, and nearly 30% were affected by cervical spondylosis [1, 2, 8]. Cervical spondylosis, a common degenerative disease, has increasingly affected younger individuals in China, spreading from middle-aged and elderly populations to the youth. Chen's study reported that 87.80% of 254 college students experienced cervical spine sub-health [9]. Zhu's survey of 8,000 college students found a cervical spondylosis prevalence rate of approximately 16.73%. Similarly, a study by Chen *et al.* involving 1,500 college students estimated the incidence of cervical spondylosis to be 27.33%.

1.2. Nonspecific neck pain

Nonspecific neck pain (NP) accounts for about 25% of all physiotherapy outpatient visits, and the number of disability-adjusted life years (DALYs) — a measure of the total burden of disease, reflecting the years lost due to illness, disability, or early death — has surged from 17 million in 1990 to 29 million in 2016. The prevalence of neck pain in the general population worldwide ranges from 0.4% to 86.8% [10]. Most patients with NP do not experience complete resolution of symptoms, with reports indicating a relapse rate of 50–85% within 1 to 5 years after recovery. Additionally, the Global Burden of Disease Study highlights that neck pain is one of the leading causes of disability among adolescents, surpassing other health issues such as asthma, alcohol, and drug use [3, 5, 7]. Studies have also shown that shoulder and neck pain is more prevalent among children and adolescents in developing countries. For example, in Iran, 28.6% of teens reported experiencing neck or shoulder pain. Furthermore, neck and shoulder pain during adolescence is considered a risk factor for long-term health problems [1]. Consequently, there is an urgent need for control and prevention strategies to address the development of such issues.

This research primarily aims to develop a questionnaire to evaluate knowledge, beliefs, and actions for the prevention of cervical spondylosis among college students. Based on the theoretical framework of knowledge, belief, and action theory, the questionnaire was designed to reflect the characteristics of the survey subjects, and its reliability and validity were assessed. Using statistical analysis methods such as normality tests, Mann-Whitney U tests or Kruskal-Wallis H tests, and multiple linear regression analysis, comparisons were made across groups and factors influencing cervical spondylosis prevention were analyzed [11]. Under this framework, the study discusses the level of understanding of cervical spondylosis prevention knowledge, students' attitudes toward prevention, and healthy behaviors adopted by college students in Guangxi Province. This provides a scientific basis for improving the cervical spine health level of college students and offering effective

interventions to prevent the occurrence of cervical spondylosis.

2. Methodology

We followed a four-step process to extract and analyze data from the accreditation reports: (1) data sourcing, (2) data extraction, (3) data labelling, and (4) data analysis.

2.1. Data sourcing

In this study, students from universities in Guangxi were selected as research subjects. Convenience sampling was employed to divide the samples into two categories: medical and non-medical, addressing the potential impact that academic background may have on the results of the research regarding the current status of cervical spine sub-health prevention. Five universities were selected for the distribution of online questionnaires: Guangxi University, Guilin Medical College, Guangxi University of Arts, Guangxi University of Science and Technology, and Guangxi Normal University. Surveys were conducted on cervical spine health and the current situation of knowledge, beliefs, and actions related to cervical spondylosis prevention.

According to different academic levels from the first year to the fifth year, a balanced ratio of approximately 2:2:2:2:2:1 was maintained. Each school distributed 70 questionnaires, totaling 350 questionnaires. The inclusion criteria were: (1) college students, and (2) informed consent and voluntary participation in the study. A total of 360 questionnaires were distributed, with 355 successfully recovered, achieving a recovery rate of 99.10%. After excluding 12 invalid questionnaires, 343 valid responses were analyzed.

By reviewing relevant literature, reports, and books on cervical spondylosis, including its prevalence, influencing factors, cervical spine sub-health, and exercise treatments, we gained a comprehensive understanding of the subject. Based on this, and in line with the research objectives, the necessary theoretical knowledge was organized. The literature research method was utilized to develop questionnaires on knowledge, beliefs, and actions for the prevention of cervical spondylosis, as well as questionnaires addressing the prevention needs of cervical spondylosis.

2.2. Data extraction

The questionnaire was formulated by consulting a large number of literature sources, incorporating specific local facts from Yulin, and guided by the tutor. This section consists of demographic and sociological data about the mother, along with information related to pregnancy and delivery. A total of 14 items are included: maternal age, education level, marital status, residence situation, monthly household income per capita, mode of delivery, delivery experience, pregnancy complications, infant birth status, infant birth weight, primary postpartum caregiver, place of confinement, postpartum depression, and postpartum sleep.

2.3. Data labeling

(1) Basic information questionnaire: Includes gender, grade, major, smoking status (defined as college students who have smoked cigarettes daily in the past 30 days or are currently smoking cigarettes, regardless of frequency), and alcohol consumption (defined as having consumed at least one alcoholic beverage in at least one day in the past 30 days).

(2) Cervical spine sub-health assessment: Refers to the “Clinical Guidelines for Sub-healthy Traditional Chinese Medicine” and the “Guiding Principles for Clinical Research of Sub-healthy Traditional Chinese Medicine (Trial)” [4,5]. Includes a total of 13 items, each scored on a 5-point scale: “all the

time" (5 points), "often, severe" (4 points), "often, mild" (3 points), "occasionally, mild" (2 points), and "occasionally, very mild" (1 point). The total score is 65 points, with higher scores indicating worse cervical spine health.

(a) Diagnostic criteria for cervical spine sub-health: Based on the "Clinical Guidelines for Sub-healthy Traditional Chinese Medicine" and the "Guiding Principles for Clinical Research of Sub-healthy Traditional Chinese Medicine," formulated by the Sub-health Branch of the Chinese Association of Chinese Medicine [5].

(b) Clinical symptoms:

(i) Main symptoms: joint snapping, dizziness, headache, neck and shoulder stiffness, pain during activity.

(ii) Secondary symptoms: insomnia, forgetfulness, tinnitus, irritability, cold sensations, upper limb numbness, fatigue.

(c) Clinical examination: Includes soft tissue stiffness and/or tenderness in the neck and shoulder, tenderness of the spinous or transverse process.

(d) Imaging examination: No obvious abnormalities in the cervical spine.

(e) Cervical spine sub-health diagnosis: Persistent or recurrent symptoms for more than three months, including at least two main symptoms or one main and one secondary symptom, accompanied by positive physical examination findings, with no clinical imaging abnormalities indicating cervical spondylosis or related organic lesions.

(3) Questionnaire on knowledge, attitude, and behavior of cervical spondylosis prevention in college students: Includes three dimensions—knowledge, attitude, and behavior—with a total of 14 questions designed to assess and analyze college students' level of understanding, attitudes, and actions toward cervical spondylosis prevention, along with its influencing factors.

(4) Questionnaire on the needs of college students for cervical spondylosis prevention: Investigates the barriers that hinder cervical spondylosis prevention among college students, including their knowledge needs and preventive needs for cervical spondylosis.

2.4. Data analysis

Excel was used to create a database, and Statistical Package for the Social Sciences (SPSS 27.0) was employed for data processing and analysis. The data were analyzed using frequency counts and percentages. Continuous data were assessed for normal distribution, with mean ± standard deviation provided alongside median and quartile ranges for better understanding. Spearman's correlation analysis was utilized to explore relationships between variables. The study investigated the current status of cervical spondylosis prevention and treatment among college students and analyzed influencing factors. For comparisons between groups or to assess influencing factors, statistical methods such as normality tests, Mann-Whitney U tests, Kruskal-Wallis H tests, and multiple linear regression analysis were employed.

3. Results

3.1. The general situation of the subject of the investigation

Among the 343 college students, 164 were male, accounting for 47.5%, 179 were female, accounting for 41.9%

of the total, and 77 were in the first year, accounting for 22.3% of the total. 71 students in the second year, accounting for 20.6% of the total. There are 68 students in the third year, accounting for the total number 19.7%. There are 25 students in the final year, accounting for 7.2% of the total population. There were 91 medical students, accounting for 24.6% of the total, and 252 non-medical students, accounting for 73% of the total. There were 114 smokers, or 33%, and 229 non-smokers, or 66.4%. The number of drinkers was 167, accounting for 48.6%, and the number of non-drinkers was 176, accounting for 51%.

3.2. The current situation of cervical spine sub-health of college students

The total score of the questionnaire for cervical sub-health was 65 points, and in this survey, the average score was 24.22 ± 7.82. The highest score of "main symptoms" was 20 points, and the average score was 8.12 ± 2.76 points. The highest score of "secondary disease" was 35 points, and the average score was 13.90 ± 4.46 points. The highest score was 5 for both "signs" and imaging, while the mean score was 1.67 ± 1.0 and 0.52 ± 1.52, respectively. Overall data is shown in **Table 1**.

Table 1. Overall score of cervical spine sub-health (n = 343)

Name	Marks	$\bar{x} \pm s$
Score	65	35.257 ± 12.681
Secondary symptoms	20	18.991 ± 7.277
Main symptoms	35	11.318 ± 4.47
Signs	5	2.787 ± 1.403
Imaging tests	5	2.646 ± 1.439

The cervical spine health status of the 343 universities was as follows: 153 people with sub-health status of the cervical spine accounted for 44.3% of the survey sample, and 190 people with cervical spine health status accounted for 55.7% of the survey sample.

3.3. The current situation of Guangxi college students' knowledge, belief and action

The total score of 343 respondents was 70.00 (62.50, 75.83), with 82.5% of the total sample being medium and high level, and 17.5% of them were at the low level. The knowledge dimension was 79.17 (66.67, 87.50), with 18.3% of the total sample of high-level research subjects, 37.9% of medium-level research subjects, and only 15.5% of the survey subjects were low-level. The attitude dimension was 80.00 (75.00, 95.00) points, with high level attitude accounting for 67.9% of the respondents, medium level accounting for 16.6% of the total respondents, 15.5% of the respondents at the low level of attitude, and the overall high and high level. The behavioral dimension was 46.67 (40.00, 56.67) points, with high level of behavior accounting for 9% of the total sample, medium level accounting for 60.3%, and low-level accounting for 30.6%. 79.88% of the respondents thought that "lack of knowledge," 76.68% of the respondents believed "lack of time," 74.05% of the respondents chose "economic reasons," 70.55% of the respondents believed "lack of support," 67.93% of the respondents believed "lack of confidence," and 45.77% of the respondents chose "physical condition."

4. Discussion

The results of this survey show that 44.3% of college students have sub-healthy cervical spondylosis, and only 55.7% have healthy cervical spine. This study is consistent with the results of Zhang's survey on the cervical spine health status of Chengdu college students, with cervical spondylosis accounting for 10.31% of the total sample, cervical spine sub-health (44.57%), and cervical spine health (45.12%). Compared with Ren's survey of 2,261 college students in Beijing, the incidence of cervical spine sub-health was 45.5%, and the results of the survey were not different [8]. Compared with Chen's survey of 254 college students in Jiangsu, the incidence of cervical spine sub-health was 87.8%.

This suggests that under the current severe environment, the pressure of college students' campus learning competition is gradually increasing, and college students have a high risk of cervical spondylosis, so it is necessary to take relevant measures in time to reduce the prevalence of cervical spondylosis among college students and reduce the impact of cervical spine sub-health on college students' study and life. It is suggested to form a three-in-one cervical spondylosis prevention mechanism of the government, individuals and schools, and form a comprehensive and mature prevention network, so as to reduce the prevalence of cervical spondylosis sub-health among college students.

5. Conclusion

The current status of cervical spine health among Guangxi college students showed that 434 students were assessed, with 153 (44.3%) in a sub-healthy state and 190 (55.1%) in a healthy state. Guangxi college students face significant sub-health issues related to cervical spondylosis, which are not significantly associated with demographic factors such as gender, grade, and major. However, there is a significant correlation with sub-health prevalence due to poor lifestyle habits, such as smoking and drinking. The knowledge, belief, and practice of cervical spondylosis prevention among college students in Guangxi are at a medium to high level, with knowledge and attitude levels also being moderate to high. However, health-related behaviors for cervical spondylosis prevention remain at a low level. Thus, the prevention of cervical spondylosis among college students requires further improvement and enhancement.

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Disclosure statement

The authors declare no conflict of interest.

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