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ORIGINAL RESEARCH

Knowledge, Attitudes, and Practices Among Community Populations Toward Long COVID in China

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Purpose: This study aimed to assess the knowledge, attitudes and practices (KAP) among community populations toward Long COVID.

Patients and Methods: This cross-sectional study was conducted between March 2023 and June 2023 at the Ordos Mongolian hospital and Ordos Central Hospital in Ordos, Inner Mongolia, China, employing a self-designed questionnaire to collect demographic data from community populations and evaluate their knowledge, attitudes, and practices toward Long COVID.

Results: A total of 591 participants were enrolled in this study. Among them, 343 (58.04%) were female and 317 (53.64%) aged 40 to 59 years. The mean knowledge, attitudes and practices scores were 6.02±1.19 (possible range: 0–7), 26.83±2.96 (possible range: 7–35), and 45.91±7.20 (possible range: 11–55), respectively. The Pearson's correlation analysis indicated significant positive correlations between knowledge and attitudes (r=0.210, $P<0.001$), and attitudes and practices (r=0.476, $P<0.001$). The structural equation model demonstrated that knowledge positively affect attitudes, as indicated by a path coefficient of 1.028 ($P<0.001$), and attitudes positively affect practices, with a path coefficient of 0.817 ($P<0.001$).

Conclusion: Although our findings indicate that community populations generally have adequate knowledge, active attitudes, and proactive practices regarding Long COVID, there is still a need for healthcare providers to further enhance Long COVID awareness in the community. This involves fostering positive attitudes through open communication, emphasizing the importance of early intervention and treatment adherence, and encouraging continued adherence to preventive measures.

Keywords: knowledge, attitudes, practices, long COVID, cross-sectional study, community, China, questionnaire, structural equation model

Introduction

Long COVID, also referred to as long-haul COVID-19 or chronic COVID-19, describes a condition in which individuals experience persistent and varied symptoms following a previous COVID-19 infection. These symptoms may include anxiety, depression, dizziness, chest pain, sleep disturbances, palpitations, weight loss, and hair loss.[1–3] These persistent symptoms, encompassing fatigue, breathlessness, cognitive dysfunction, and others, have led to the interchangeable use of terms like post-COVID syndrome or long-haul COVID.[4] Alarmingly, it affects roughly one-third of individuals who have recovered from acute COVID-19, and as of now, a definitive and effective treatment strategy remains elusive.[5] This syndrome is distinguished by its ability to endure or reoccur beyond the initial acute phase, often persisting for weeks or even months.

Community populations wield significant influence in both the transmission and management of COVID-19, along with its associated long-term consequences, such as long COVID. A noteworthy phenomenon in the context of long COVID is its emergence as perhaps the foremost illness collectively identified and defined by patients through various social media platforms.[6] The convergence of COVID-19 and long COVID symptoms has engendered confusion among

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individuals, precipitating feelings of anxiety, panic, and resulting in superfluous medical consultations.[7] This confusion, in turn, exerts additional pressure on healthcare resources and impedes the judicious allocation of care.[8]

A Knowledge, Attitude, and Practices (KAP) survey is a research methodology employed to gauge the comprehension, viewpoints, and actions of a particular group pertaining to a specific subject matter. This method functions as a diagnostic instrument, delving into the realm of what individuals are cognizant of (knowledge), their thoughts and sentiments (attitudes), and the behavioral patterns they exhibit (practices) concerning the designated topic.[9–11] In the context of long COVID, the application of the KAP model facilitates a holistic comprehension of how community populations perceive and react to this condition. Through the assessment of knowledge and attitudes, this approach enables the identification of specific deficiencies, thereby paving the way for the development of tailored educational interventions.

Previous research has shown that long COVID patients not only suffer from the disease itself but also endure social stigma and discrimination.[12] However, there is currently a lack of KAP studies in this area. Therefore, this study aimed to investigate the knowledge, attitudes, and practices of community populations toward long COVID. Through an exploration of individuals' comprehension and actions concerning long COVID, this study endeavors to furnish valuable insights.

Methods

Study Design and Participants

This cross-sectional study was conducted from between March 2023 and June 2023 at Ordos Mongolian Hospital and Ordos Central Hospital, involving community populations. The inclusion criteria were as follows: (1) consent to participate; (2) aged between 18 and 70 years; and (3) individuals diagnosed with COVID-19 or their family members (either self-reported or confirmed by the hospital). While the exclusion criteria comprised those with severe cognitive or psychological impairment and individuals concurrently participating in similar studies. The study was ethically approved by the Ordos Mongolia hospital Medical Ethics Committee (Approval No. 202304) and informed consent was obtained from the study participants.

Questionnaire

The questionnaire was developed with guidance from the Expert Consensus on the NICE guideline on long COVID,[13] and relevant literature on long COVID management.[14,15] The first draft was revised with input from senior experts from Ordos Mongolian hospital and then pilot tested on a small scale (n=56), resulting in a Cronbach's alpha coefficient value of 0.899, indicating good internal consistency.

The final questionnaire, composed in Chinese, comprised four dimensions: demographic information, knowledge, attitudes, and practices. The demographic section included 15 items, while the knowledge, attitude, and practice sections consisted of 9, 7, and 11 items, respectively. Knowledge items were awarded 1 point for correct answers and 0 points for incorrect responses. Notably, questions K6 and K9 were designed as trap questions, presenting exactly opposite meanings. Respondents who selected "right" or "wrong" for both questions were identified as having a logical conflict and were subsequently excluded from the survey. Consequently, knowledge scores ranged from 0 to 7. Attitude items were assessed using a five-point Likert scale, ranging from strongly agree (5 points) to strongly disagree (1 point), resulting in a possible score range of 7 to 35. Similarly, practice items were also rated on a five-point Likert scale, ranging from very consistent (5 points) to very inconsistent (1 point), yielding a possible score range of 11 to 55. Attaining scores above 70% of the maximum in each section indicated adequate knowledge, active attitude, and proactive practice.[16]

The survey was administered by outpatient nurses and research graduate students who explained the purpose, content, and requirements of the questionnaire to the participants. Data collection was facilitated through an online questionnaire platform hosted on Sojump (http://www.sojump.com). In preparation for this study, graduate students from Ordos Mongolian hospital underwent training in the distribution and retrieval of questionnaires. These questionnaires were disseminated by means of QR codes, which were conveniently accessible within the outpatient department's waiting area.

Sample Size

Sample size was calculated using the formula for cross-sectional studies: $\alpha=0.05$, $n=(Z_{(1-\alpha/2)}/\delta)^2\times p\times(1-p)$ where $Z_{(1-\alpha/2)}=1.96$ when $\alpha=0.05$, the assumed degree of variability of $p=0.5$ maximises the required sample size, and δ is

admissible error (which was 5% here). The theoretical sample size was 480 which includes an extra 20% to allow for subjects lost during the study.

Statistical Analysis

Statistical analysis was conducted using STATA 17.0 (Stata Corporation, College Station, TX, USA) and AMOS 24.0 (IBM, NY, United States). Continuous variables were described using mean±standard deviation (SD), and between-group comparisons were performed using *t*-tests or analysis of variance (ANOVA). Categorical variables were presented as n (%). Pearson correlation analysis was employed to assess the correlations between knowledge, attitude, and practice scores. The structural equation model (SEM) was employed to assess the relationships of knowledge, attitudes and practices among community populations toward long COVID. The hypotheses were as follows: 1) knowledge had direct effects on attitude, 2) knowledge had direct effects on practice, and 3) attitude had direct effects on practice. The model fitting was evaluated with CMIN/DF (Chi-square fit statistics/degree of freedom), RMSEA (root mean square error of approximation), IFI (incremental fix index), TLI (Tucker-Lewis index) and CFI (comparative fix index). Two-sided $p<0.05$ were considered statistically significant.

Results

Initially, a total of 1069 questionnaires were gathered. Subsequently, 21 instances characterized by informed dissent were excluded, along with 52 cases exhibiting response times of less than 100 seconds. Furthermore, 405 questionnaires displaying logical inconsistencies were omitted from the analysis. Ultimately, this meticulous procedure yielded a total of 591 valid questionnaires for use in this research. Among them, 343 (58.04%) of the participants were female, 317 (53.64%) were aged 40 to 59 years, 370 (62.61%) had a Body Mass Index (BMI) of 18.5 to 23.9 kg/m² (normal), 463 (78.34%) lived in urban areas, 276 (46.70%) had an education level of junior college or bachelor's degree, and 336 (56.85%) were employed. Additionally, 385 (65.14%) did not have a regular exercise habit. Furthermore, 390 (65.99%) had received all three doses of the vaccine, and 508 (85.96%) did not have a history of COVID-19 infection (Table 1).

The mean knowledge, attitudes and practices scores were 6.02±1.19 (possible range: 0–7), 26.83±2.96 (possible range: 7–35), and 45.91±7.20 (possible range: 11–55), respectively. The knowledge score varied from those with different gender (*P*=0.046), education (*P*=0.014), smoking status (*P*=0.013), and alcohol consumption (*P*=0.032). As for the attitude score,

Table 1 Demographic Characteristics and KAP Scores

Variables	N (%)	Knowledge		Attitude		Practice	
		Mean±SD	*P*	Mean±SD	*P*	Mean±SD	*P*
Total	591	6.02±1.19		26.83±2.96		45.91±7.20	
Gender			0.046*		0.694		0.429
Male	248 (41.96)	5.90±1.30		26.89±3.01		46.19±7.65	
Female	343 (58.04)	6.10±1.11		26.79±2.92		45.71±6.85	
Age (years old)			0.446		0.375		0.208
Below 20	12 (2.03)	5.92±1.16		26.67±4.83		41.92±8.35	
20–39	231 (39.09)	5.97±1.23		27.09±2.95		45.97±7.28	
40–59	317 (53.64)	6.08±1.15		26.68±2.86		45.91±7.04	
60 or above	31 (5.25)	5.77±1.38		26.45±3.10		47.10±7.51	
Body mass index (BMI) (kg/m^2)			0.962		0.066		0.001**
< 18.5	49 (8.29)	6.10±1.01		27.67±3.50		45.80±6.95	
18.5 ≤ BMI<24	370 (62.61)	6.01±1.27		26.66±3.02		45.57±7.15	
24 ≤ BMI<28	137 (23.18)	6.02±1.09		27.10±2.52		47.66±7.06	
BMI ≥ 28	35 (5.92)	6.03±1.04		26.37±2.84		42.83±7.29	
Residence			0.088		0.126		0.233
Rural	128 (21.66)	5.86±1.19		26.48±3.12		45.24±7.27	
Urban	463 (78.34)	6.06±1.19		26.93±2.90		46.10±7.17	

(*Continued*)

Table 1 (Continued).

Variables	N (%)	Knowledge		Attitude		Practice	
		Mean±SD	*P*	Mean±SD	*P*	Mean±SD	*P*
Marital Status			0.064		0.046*		0.028*
Unmarried	116 (19.63)	6.23±1.08		27.43±3.43		44.32±7.69	
Married	458 (77.50)	5.98±1.20		26.67±2.76		46.31±7.01	
Other	17 (2.88)	5.71±1.53		27.00±3.98		46.00±7.51	
Education			0.014*		0.012*		0.056
Junior high school and below	129 (21.83)	5.87±1.29		26.11±2.58		44.67±7.03	
Senior high school and vocational	120 (20.30)	5.84±1.29		26.81±3.10		46.07±7.62	
Junior college and bachelor's degree	276 (46.70)	6.09±1.13		27.09±3.01		46.63±6.95	
Master's degree and above	66 (11.17)	6.35±1.00		27.18±2.95		45.08±7.49	
Occupation			0.909		0.693		0.315
Formal employee/part-time/self-employed	336 (56.85)	6.03±1.19		26.90±2.89		46.25±7.24	
Unemployed	48 (8.12)	6.08±1.13		26.94±2.82		44.54±6.58	
Retired	34 (5.75)	6.09±1.24		27.09±3.08		46.74±6.64	
Other	173 (29.27)	5.97±1.23		26.61±3.10		45.48±7.37	
Monthly Per Capita Income (CNY)			0.255		0.213		0.243
<2000	82 (13.87)	5.83±1.28		26.79±3.03		45.46±6.88	
2000–5000	202 (34.18)	6.09±1.15		26.70±2.75		45.10±7.32	
5000–10,000	216 (36.55)	5.98±1.20		26.72±3.00		46.62±7.10	
10,000–20,000	71 (12.01)	6.20±1.02		27.62±3.10		46.48±7.07	
20,000	20 (3.38)	5.80±1.58		26.65±3.45		46.25±8.28	
Underlying chronic conditions (Multiple choices)							
Hypertension	93 (15.74)	6.11±1.13		26.85±2.66		46.31±7.84	
Hyperlipidemia	50 (8.46)	6.08±1.14		26.68±2.76		46.72±6.85	
Hyperuricemia	28 (4.74)	5.79±1.03		27.00±2.76		48.21±7.43	
Pancreatic disorders	3 (0.51)	7.00		29.00±3.46		45.33±11.93	
Coronary artery heart disease	12 (2.03)	6.00±1.35		24.92±4.27		43.58±7.39	
Cerebrovascular disease	5 (0.85)	6.80±0.45		24.40±4.45		40.80±8.04	
Other diseases	57 (9.64)	6.35±0.94		26.93±2.70		47.58±6.21	
None of the above	418 (70.73)	5.96±1.24		26.84±3.02		45.59±7.14	
Smoking			0.013*		0.110		0.801
Yes	112 (18.95)	5.77±1.32		26.43±2.59		45.76±7.67	
No	479 (81.05)	6.08±1.16		26.92±3.03		45.95±7.09	
Alcohol Consumption			0.032*		0.676		0.154
Yes	168 (28.43)	5.85±1.31		26.75±2.79		46.58±7.49	
No	423 (71.57)	6.09±1.14		26.86±3.02		45.65±7.07	
Preference for Oily, Salty, or Spicy Foods			0.489		0.560		0.350
Yes	227 (38.41)	6.06±1.21		26.92±2.74		46.26±7.29	
No	364 (61.59)	5.99±1.18		26.77±3.09		45.70±7.14	
Regular Exercise Habits			0.952		0.066		<0.001**
Yes	206 (34.86)	6.01±1.19		27.14±3.08		47.66±6.48	
No	385 (65.14)	6.02±1.20		26.67±2.88		44.98±7.39	
COVID-19 Vaccination Status			0.093		0.197		0.104
Not vaccinated	34 (5.75)	6.32±0.68		27.09±2.14		48.38±6.22	
Received 1–2 doses of vaccine	167 (28.26)	5.88±1.33		26.49±2.95		46.01±7.35	
Received all 3 doses of vaccine	390 (65.99)	6.05±1.16		26.96±3.01		45.66±7.18	
History of COVID-19 Infection			0.101		0.101		0.998
Yes	83 (14.04)	5.82±1.27		26.34±3.24		45.92±7.38	
No	508 (85.96)	6.05±1.18		26.91±2.90		45.91±7.17	

Notes: *refers to $P< 0.05$; **refers to $P< 0.01$.
Abbreviations: BMI, Body Mass Index; K, knowledge; A, attitude; P, practice.

there were difference among community populations with different marital and reproductive status (P=0.046), and education (P=0.012). The difference of practice score were found among community populations with different BMI (kg/m^2) (P=0.001), marital and reproductive status (P=0.028), and regular exercise habits (P<0.001) (Table 1).

The distribution of knowledge dimensions showed that the three knowledge items with the highest correctness rates were as follows: "Long COVID may manifest in individuals beyond the elderly population". (K3) with 93.23%, "The routine management of individuals with Long COVID involves a healthful diet, regular physical activity, adequate sleep, and psychological support". (K5) with 91.88%, and "Regular follow-up appointments are necessary for patients with Long COVID to monitor changes in their condition". (K8) with 91.54%. The three items with the lowest correctness rates were "Common symptoms of Long COVID encompass fatigue, palpitations, chest tightness, joint pain, and diminished attention span". (K1) with 81.05%, "Therapeutic interventions for Long COVID primarily target alleviating symptoms and enhancing quality of life." (K2) with 78.51%, and "Long COVID could potentially result in permanent cardiopulmonary impairment". (K4) with 74.62%. (Supplementary Table 1).

Moreover, 61.08% of the participants agreed to actively acquire comprehensive knowledge related to Long COVID (A1), and 65.14% were willing to communicate with family and friends about potential symptoms of Long COVID (A2). 28.60% strongly agreed as well as 59.90% agreed that prompt medical treatment is the key to the management of Long COVID (A3). 60.41% agreed that exercise rehabilitation is very important to alleviate the symptoms of Long COVID is very important (A4). 61.42% agreed that receiving psychological interventions is very important for patients with Long COVID (A5). 51.61% were concerned that Long COVID would have a detrimental effect on the economy and society as a whole, but at the same time, the highest percentage of people were neutral on this topic (25.55%) (A6). More than 90% (90.02%) believed that awareness of Long COVID should be raised to better protect themselves and others (A7) (Supplementary Table 2).

When it comes to practice, 74.28% acquire knowledge related to Long COVID through channels such as public accounts and short videos (P1). 73.27% exchanged ideas on prevention and treatment of Long COVID with their doctors or family friends (P2). To cope with or improve Long COVID, 73.71% maintained regular physical exercise and a nutritious diet (P3), 72.25% received psychological counselling to maintain a positive mindset (P4), 80.71% sought professional medical support promptly (P5), and 80.71% took medication as prescribed by their doctor (P6). To prevent Long COVID, 69.37% regularly monitored their body temperature (P7), 86.81% paid attention to ensuring indoor air circulation (P8), 82.91% still insisted on wearing masks in public places even though this was not required by the prevention and control policy (P9), 85.45% paid attention to hand hygiene through hand sanitizers or disinfectants (P10), and 82.23% avoided crowded public places as much as possible (P11) (Supplementary Table 3).

The Pearson's correlation analysis was shown that the knowledge and the attitude were positively correlated (r=0.210, P<0.001). Additionally, there also a positive correlation between attitude and practice (r=0.476, P<0.001) (Table 2).

SEM showed that knowledge positively affect attitude, as indicated by a path coefficient of 1.028 (P<0.001), while attitude positively affect practice, with a path coefficient of 0.817 (P<0.001) (Figure 1 and Table 3). The fitting index of the structural equation model (CMIN/DF=3.197, RMSEA=0.061, IFI=0.923, TLI=0.913, CFI=0.923) outperformed the respective threshold value, signifying that the data fit the structural model satisfactorily (Table 4).

Table 2 Pearson's Correlation Analysis

	Knowledge	Attitudes	Practices
Knowledge	1		
Attitudes	0.210(P<0.001)	1	
Practices	0.063(P=0.124)	0.476(P<0.001)	1

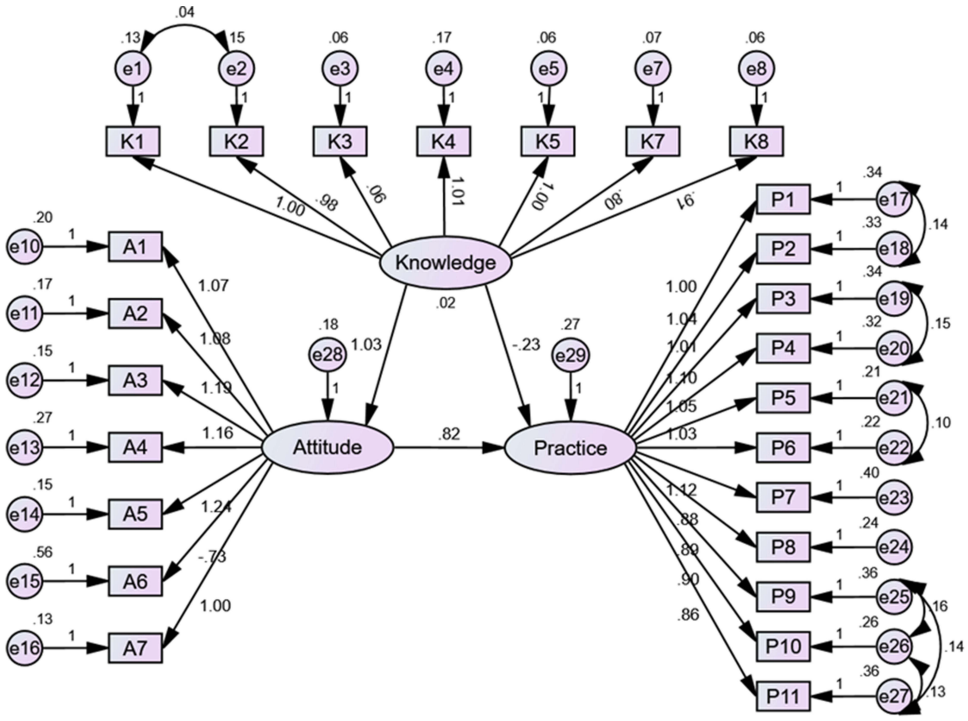

Figure 1 Structural equation modeling.

Discussion

The findings revealed that community populations have adequate knowledge, active attitude, and proactive practice toward the Long COVID. A prior review has revealed the inclusion of various strategies, such as the integration of digital technology into pandemic prevention efforts, the implementation of a zero-case policy, universal nucleic acid testing for all personnel, comprehensive vaccination campaigns, the establishment of a prolonged quarantine system, the management of recurrent pandemic waves, increased economic constraints, and the emergence of social exhaustion. These multifaceted strategies collectively contributed to the deceleration of the global pandemic spread and the advancement of

Table 3 Test Results of the Hypothesis

Hypothesis			Estimate	*P*
Attitude	<—	Knowledge	1.028	<0.001
Practice	<—	Attitude	0.817	<0.001
Practice	<—	Knowledge	−0.231	0.365

Table 4 Model Fit

Goodness-of-Fit Indices	Ideal standards	Measurement value
CMIN/DF	1–3 excellent, 3–5 good	3.197
RMSEA	<0.08 good	0.061
IFI	>0.8 good	0.923
TLI	>0.8 good	0.913
CFI	>0.8 good	0.923

Abbreviations: CMIN/DF, Chi-square fit statistics/degree of freedom; RMSEA, root mean square error of approximation; IFI, incremental fix index; TLI, Tucker-Lewis index; CFI, comparative fix index.

global vaccine accessibility.[17,18] Furthermore, they subtly influenced community populations' knowledge, attitudes, and practices toward long COVID.

However, it is noteworthy that variations in KAP scores among participants exhibiting distinct sociodemographic traits underscore the continued necessity for enhanced health education efforts. Healthcare providers should prioritize community education to enhance knowledge about Long COVID, foster positive attitudes through open communication, emphasize early medical intervention and treatment adherence,[19] and promote ongoing public health measures like mask-wearing and hand hygiene to enhance preventive practices.[20,21]

In this study, notable variations were observed in knowledge, attitudes, and practices regarding a specific health topic among the community population. These differences were associated with demographic factors such as gender, education, marital and reproductive status, smoking, alcohol consumption, BMI, and exercise habits. Such findings emphasize the need for tailored health education and promotion strategies that consider the unique characteristics of subgroups within the community.[22] Furthermore, the results underscore the potential benefits of targeted interventions, particularly in individuals with higher BMIs and sedentary lifestyles. These insights can inform more effective clinical practice by enabling healthcare professionals to design interventions that resonate with the specific needs and characteristics of their patient populations, ultimately leading to improved health outcomes.

The knowledge dimensions revealed both promising insights and potential areas for improvement in the understanding and clinical management of Long COVID. Notably, the high correctness rates associated with the awareness that Long COVID might affect individuals beyond the elderly population signifies that the community populations does not exhibit age bias in their comprehension of long COVID, demonstrating a relatively objective awareness of age-associated long COVID risks (K3). However, the lower correctness rates regarding the potential for permanent cardiopulmonary impairment demonstrated a crucial knowledge gap that healthcare practitioners should address to provide comprehensive care and inform patients adequately. These findings underscored the importance of enhancing education and communication efforts surrounding Long COVID, prioritizing areas with knowledge disparities to ensure better-informed decisions and improved clinical practice.

The findings of attitude dimension revealed that a majority of participants have a positive attitude toward acquiring knowledge about Long COVID and were willing to communicate with their social circles about potential symptoms. These results aligned with the broader literature on health education and the importance of social support networks in health management. In clinical practice, these findings underscored the significance of patient education and encouraging open dialogue among individuals and their loved ones, which might play a pivotal role in the early detection and management of Long COVID.[23] Furthermore, healthcare professionals should continue to engage in public awareness campaigns to address concerns about the societal impact of Long COVID and promote proactive measures for its prevention and treatment.

Individuals had taken a proactive and informed approach to Long COVID, with a significant proportion engaging in practices that emphasize knowledge acquisition, open communication with healthcare providers and social circles, healthy lifestyles, and rigorous preventive measures. This aligned with modern trends in health information consumption and highlights the importance of digital platforms in knowledge dissemination.[23,24] Healthcare providers should capitalize on this willingness to engage in positive health behaviors by fostering open dialogues with patients, emphasizing the value of early medical intervention and adherence to prescribed treatments, and promoting public health measures even when not mandated by policies.

Several demographic factors that influenced KAP were identified. For example, gender, education, smoking status, and alcohol consumption were associated with variations in knowledge scores.[25] Similarly, marital and reproductive status, education, BMI, and regular exercise habits influenced attitude and practice scores.[26] Recognizing these factors may help tailor clinical interventions to specific demographic groups, thereby enhancing the effectiveness of educational programs.

A noteworthy finding is the positive correlation between knowledge and attitudes and between attitudes and practices.[27] However, knowledge did not directly impact practices, emphasizing the need for a comprehensive approach to behavioral change.[28] This observation aligns with established literature highlighting the role of attitudes and social factors in translating knowledge into action.

These findings suggest important implications for the resilience of the national health system in managing Long COVID. The observed variations in knowledge, attitudes, and practices across different demographic groups—particularly

in relation to gender, education level, BMI, smoking, and alcohol consumption—indicate that national health policies might benefit from considering tailored interventions. Targeted educational campaigns that address the specific needs of these groups could potentially enhance the effectiveness of public health efforts in managing Long COVID. By focusing on these demographic factors, health authorities could improve the community's ability to respond to Long COVID, thereby contributing to the overall resilience of the health system. However, further research is needed to explore how these tailored interventions can be optimized and to evaluate their long-term impact on public health outcomes.

There are some limitations in this study. Firstly, the study's cross-sectional design only offers a snapshot of knowledge, attitudes, and practices at a specific moment, which limits the ability to establish causality or observe changes over time. Additionally, the reliance on self-reported data could introduce response bias, as participants might provide answers that are socially desirable rather than reflective of their true behaviors and attitudes. Moreover, the study may also be limited by the specific demographic and geographic characteristics of the sample, which could affect the generalizability of the findings to broader populations. Finally, unmeasured confounding variables, such as participants' access to healthcare and health literacy levels, could have influenced the results, but were not accounted for in the analysis.

Conclusions

In conclusion, community populations in China had adequate knowledge, active attitude, and proactive practice toward the Long COVID. Healthcare providers should prioritize comprehensive education on less-discussed aspects of Long COVID, tailoring materials to address demographic concerns, while also acknowledging and addressing economic worries. Community engagement and communication are crucial for creating a supportive environment, fostering awareness, and promoting positive practices. Tailored interventions, including gender-specific campaigns and age-targeted education, are recommended to effectively engage specific groups, and alongside knowledge dissemination, behavioral interventions and social support networks should be considered to bridge the gap between awareness and action.

Data Sharing Statement

All data generated or analysed during this study are included in this article.

Ethics Approval and Consent to Participate

The study was ethically approved by the Ordos Mongolia hospital Medical Ethics Committee (Approval No. 202304) and informed consent was obtained from the study participants. All methods were performed in accordance with the relevant guidelines and regulations. This study is in compliance with the Declaration of Helsinki.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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