

The Influence of Identity Bubble Reinforcement on the Happiness Index among Chinese Medical Staff: The Mediating Role of General Self-Efficacy

ABSTRACT

Objective: This study aimed to explore the mediating role of general self-efficacy in the influence of social media identity bubble reinforcement on the happiness index among Chinese medical staff.

Methods: This study utilized data (n=877) from the 2022 Psychological and Behavioral Investigation of Chinese Residents (PBICR) related to medical staff. Correlation analysis was performed using SPSS 26.0 software, and the relationships between general self-efficacy, social media identity bubble reinforcement, and the happiness index of Chinese medical staff were examined using AMOS 23.0 software.

Results: The happiness index of Chinese medical staff was scored at 2.93 ± 1.21 for each item. Social media identity bubble reinforcement among Chinese medical staff was positively correlated with general self-efficacy ($r=0.380, P < .001$), as well as with the happiness index ($r=0.330, P < .001$). General self-efficacy was positively correlated with the happiness index ($r=0.575, P < .001$) and was found to mediate the relationship between social media identity bubble reinforcement and the happiness index of Chinese medical staff. In terms of the mediating effect of social media identity bubble reinforcement, the direct effect's 95% confidence interval (CI) was 0.031-0.142, accounting for 34.68% of the total effect, which is statistically significant ($P=.015$), while the 95% CI of the indirect effect was 0.125-0.212, representing 65.32% of the total effect, also statistically significant ($P=.005$).

Conclusion: Social media identity bubble reinforcement and general self-efficacy were found to be important factors influencing the happiness index of medical staff. Hospital managers and policymakers can thus enhance the social media identity bubble reinforcement and general self-efficacy of Chinese medical staff through effective measures to improve their happiness indices.

Keywords: Chinese medical staff, happiness, self-efficacy, social media identity bubble intensification

Introduction

Happiness represents an individual's subjective, holistic, and relatively stable evaluation of their current quality of life, satisfaction, and sense of joy. It is an important comprehensive psychological indicator for measuring life satisfaction and emotional experiences, both positive and negative.¹ A reduction in happiness has been shown to be associated with various negative psychological states,² leading to various negative behaviors and even adversely affecting work enthusiasm and efficiency. The happiness of medical staff has a marked impact on their goal achievement, work commitment, and turnover intention. Research shows that an increase in the happiness and occupational autonomy of nurses improves job satisfaction, reduces staff turnover, and enhances the quality of medical services.³ However, improvements in China's social living standards have resulted in increased demand for quality medical services, thus placing greater pressure and workloads on medical staff. In such a complex, tense, frequently conflicting, and high-load work environment, medical staff often experience anger, sleep disorders, and fatigue, which results in medical staff being even less happy than the general population.⁴

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Previous studies have investigated the factors that influence the improvement of happiness in medical staff from the aspects of workplace satisfaction,⁵ life satisfaction,⁶ leadership, work performance,⁷ perceived pressure, family companionship, and mental health.⁴ Virtual personal and social identities created through social media can enhance happiness.⁸⁻¹⁰ In social media, people select the content they are interested in to share, interact with, and spread according to their preferences, leading to the formation of networks and communities with common features and interests. People who share a common identity thus come together within a confined bubble-like space described as a social media identity bubble,¹¹ a definition that neatly fits the characteristics of online communities.

In today's internet age, over 45% of the world's population are social media users, representing 3.59 billion people.¹² Medical staff, due to the nature of their profession, often need to interact with peers, patients, and the public through social media.¹³ for the dissemination of health-related information,¹⁴ emphasizing the importance of social media among medical personnel.¹⁵ It has been reported that close to 100% of medical professionals are users of social media such as YouTube, Facebook, and WeChat.¹⁶ During and since the coronavirus disease-19 pandemic, the use of social media for medical communication and obtaining healthcare-related information has become more widespread,¹⁰ with the result that medical staff form a significant proportion of social media users. A collective is formed by individuals with common interests, goals, or identities. These individuals interact and communicate with, as well as influence, each other through social media platforms, thus forming a group with unique psychological characteristics.¹⁷ Although there have been investigations into the relationship between social media use and happiness among medical workers,¹⁸ there has been no research on the factors affecting the happiness of medical personnel from the perspective of the psychological characteristics of social media groups. Therefore, this study aimed to explore the relationship between social media identity bubble reinforcement and the happiness of medical staff, analyzing the mechanism underlying this relationship with self-efficacy theory.

The social media identity bubble represents a strengthening of a normal identity bubble in terms of 3 aspects, namely, an identification with online social networks (social identity), a tendency to interact with like-minded people (homogeneity), and a dependence on like-minded information on social media (information bias). The studies of both Diener et al¹⁹ and Blum et al²⁰ proposed that membership of social media identity bubbles is associated with happiness, with the former study focusing on social identity and the latter on homogeneity. Therefore, the following hypothesis was proposed.

MAIN POINTS

- *Mediating effect: The findings showed that general self-efficacy played a significant mediating role between identity bubble reinforcement and the happiness index in medical staff.*
- *Social media identity bubble reinforcement and happiness index: There was a positive correlation between identity bubble reinforcement and the happiness index in medical staff.*
- *General self-efficacy and happiness index: The general self-efficacy and happiness index of medical staff were also positively correlated.*

Hypothesis 1: Social media identity bubble reinforcement is positively correlated with the happiness of medical staff.

Self-efficacy²¹ is defined as "a person's confidence in their ability to use the skills they have to do a specific job," i.e., an individual's belief in their ability to complete challenges or tasks successfully and achieve specific goals. Researchers such as Wang et al²² analyzed an online network community formed by 400 message posts on the subject of weight loss and found that social identification both enhanced confidence and generated a high sense of self-efficacy. As the working pressure on medical personnel increases, they are more likely to share their thoughts and emotions on social media platforms, and social media can provide a rich, dynamic, and unique window for the expression of an individual's emotions, thoughts, and opinions,²³ generating positive emotions and enhancing their sense of self-efficacy. Reports have also shown that the psychological characteristics of medical staff in social media groups can influence their self-efficacy.²⁴ Therefore, the social media identity bubbles formed by the specific characteristics of online communities shaped by social media use can influence self-efficacy. On the other hand, in terms of the achievement motivation theory,²⁵ a person who believes that they can handle a variety of things (i.e., a person with high self-efficacy) will tend to be more confident, positive, and proactive in life, and will also be able to perceive their own strengths, which in turn increases happiness. In their study on medical personnel, Kim et al²⁶ reached the same conclusion, namely, that it is necessary to enhance the sense of self-efficacy to improve subjective happiness. Therefore, the following hypotheses were proposed.

Hypothesis 2: The identity bubble reinforcement of medical staff is positively correlated with their self-efficacy.

Hypothesis 3: The self-efficacy of medical staff is positively correlated with their happiness.

Subjective happiness theory¹ posits that subjective happiness is an individual's overall evaluation of their quality of life, influenced by emotional regulation. Self-efficacy, as a positive evaluation of one's abilities, helps individuals maintain positive emotions when facing challenges and allows them to cope effectively with pressures in life. This positive emotional state is an important component of happiness. In conclusion, there may be a correlation between the identity bubble reinforcement, self-efficacy, and happiness of medical staff. However, to date, there has been no exploration of the relationship between these 3 factors. This study, based on the above analysis, suggests that self-efficacy may be an intermediary factor between identity bubble reinforcement and happiness. Therefore, the following hypothesis was proposed.

Hypothesis 4: The general self-efficacy of medical staff mediates between social media identity bubble reinforcement and the happiness index.

Methods

Participants and Procedures

This study used data collected from the Behavioral Investigation of Chinese Residents (PBICR)²⁷ cross-sectional study using multi-stage

sampling from June 20 to August 31, 2022, involving 148 cities from 23 provinces, 5 autonomous regions, and 4 municipalities (excluding Taiwan, Hong Kong, and Macau), including Beijing, Tianjin, Shanghai, and Chongqing. Surveyors distributed and collected electronic questionnaires either face-to-face or through real-time video guidance. Prior to voluntary participation, the participants provided informed consent.²⁸ After the exclusion of respondents with extremely short completion times or inconsistent response patterns, 877 samples were included in our study. Ethical approval for this study was obtained from the Ethics Committee of the Shaanxi Provincial Center for Health Culture Research (JKWH-2022-02).

Survey Instruments

WHO-5 Scale: Happiness was measured using the World Health Organization Five-Item Well-being Index (WHO-5) scale, which consists of 5 items assessing a single dimension. Participants were asked about their feelings over the past 2 weeks regarding 5 items: "I have felt cheerful and in good spirits," "I have felt calm and relaxed," "I have felt active and vigorous," "I woke up feeling fresh and rested," and "My daily life has been filled with things that interest me." Responses were recorded on a 6-point scale (1 = at no time, 2 = some of the time, 3 = less than half of the time, 4 = more than half of the time, 5 = most of the time, 6 = all of the time), with the total score representing the sum of the scores of all items, ranging from 5 to 25. In this study, Cronbach's α was 0.907.

Identity Bubble Reinforcement Scale: The degree of engagement in social media identity bubbles was measured using the identity bubble reinforcement scale (IBRS).²⁸ This scale, comprising 6 items across 3 dimensions, has been internationally validated for assessing individuals' subjective tendencies to engage in identity-driven social subgroups on social media. In the present study, the scale included statements on social identification ("On social media, I belong to one or more communities that are important parts of my identity" and "On social media, I belong to one or more communities that make me feel proud"), homophily ("On social media, I prefer to interact with people like me" and "On social media, I prefer to interact with people who share my interests"), and information bias ("On social media, I believe the information shared with me", and "On social media, I think others' thoughts are similar to mine"). Participants responded according to their level of conformity, on a scale of 1-10 (1 = the description does not match me at all, 10 = the description fits me perfectly), the total score represents the sum of the scores of all items, ranging from 6 to 60, with a higher total score indicating a higher degree of identity bubble reinforcement. In this study, Cronbach's α was 0.77.

General Self-Efficacy: The New General Self-Efficacy Scale (NGSES) was compiled by Chen, Gully, and Eden et al.²⁹ In this study, self-efficacy was measured using the simplified version of the NGSES. Using 2 random datasets containing 11,031 subjects, the Morgan model in classical measurement theory and item response theory was used to simplify the NGSES from 8 items to 3 items, with high reliability and validity. These items ("When facing difficult tasks, I am confident I can accomplish them," "I believe I can overcome many challenges successfully," and "I am confident I can effectively deal with many different tasks") were rated on a 5-point scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree), the total score represents the sum of the scores of

all items, ranging from 3 to 15. Higher total scores indicate higher levels of self-efficacy. In this study, Cronbach's α was 0.923.

Statistical Methods

The background characteristics of the sample were analyzed by descriptive analysis and with SPSS26.0 (IBM SPSS Corp.; Armonk, NY, USA). Frequency and composition ratios were used for the presentation of count data, using the Shapiro-Wilk normality test, while Pearson's correlation coefficient was employed to determine the relationship between variables. We utilized Structural Equation Modeling (SEM) to evaluate the relationships between observed variables and latent variables. The theoretical model assumptions were tested using the Maximum Likelihood Estimation method. Bootstrapping with 2000 repetitions was employed to calculate the 95% confidence interval (CI) for indirect effects; if the 95% CI did not include zero, the indirect effect was considered significant.

The AMOS 23.0. SEM (IBM SPSS Corp.; Armonk, NY, USA) model was used for the following indices with the suggested threshold values: $\chi^2/df < 3$; Tucker-Lewis Index (TLI) >0.90 ; Normed Fit Index (NFI) >0.90 ; Root Mean Square Error of Approximation (RMSEA) <0.08 ; Goodness-of-Fit Index (GFI) >0.90 ; Incremental Fit Index (IFI) >0.90 ; and Comparative Fit Index (CFI) >0.90 .

Results

General Information

Table 1 shows that the majority of the study participants were aged between 18 and 59 years, comprising 82.7% of the sample. Females constituted 68.8%, urban residents 66.8%, and rural residents 33.2% of the study participants. Most participants were married (79.2%), with 50.2% having attained a bachelor's degree, and 22.6% being retired medical personnel.

General Self-Efficacy, Happiness Index, and Identity Bubble Reinforcement Scale Scores

Table 1 shows the mean (SD) scores for identity bubble reinforcement, self-efficacy, and happiness index as 6.38 ± 1.78 , 3.65 ± 0.78 , and 2.93 ± 1.21 , respectively. The mean (SD) scores for the social identity dimension, homogeneity dimension, and information preference dimension of identity bubble reinforcement were 6.11 ± 2.11 , 6.81 ± 1.98 , and 6.15 ± 1.91 , respectively.

Correlation Analysis of General Self-Efficacy, Happiness Index, and Identity Bubble Reinforcement among Medical Staff

Table 2 shows significant positive correlations among the variables. The Pearson correlation coefficient indicated a positive correlation between the happiness index and general self-efficacy ($r=0.575$, $P < .001$), and between the identity bubble reinforcement and general self-efficacy as well as the happiness index ($r=0.380$, $P < .001$; $r=0.330$, $P < .001$), providing preliminary support for the research hypotheses.

Mediation Effect of General Self-Efficacy

Figure 1 shows the standardized coefficients of all paths in the general self-efficacy mediation model. Since both Happiness Index 1 and Happiness Index 2 may express the same concept and belong in the same dimension of the same observed variable, a correlational connection was implemented between the residuals of Happiness Index

Table 1. General Information on the Survey Participants (n=877)

Variable	Group	Frequency (%)	Scale and Dimension	Number of Items	Item Score (Points, $\bar{X} \pm s$)
Gender	Male	274 (31.2)	General self-efficacy scale	3	3.65 ± 0.78
	Female	603 (68.8)	WHO-5 scale	5	2.93 ± 1.21
Age (years)	12-17	2 (0.2)	IBRS	6	6.38 ± 1.78
	18-59	725 (82.7)	Social identity dimension	2	6.11 ± 2.11
	60 and above	15 (1.7)	Homogeneity dimension	2	6.81 ± 1.98
Education	Junior college and below	331 (37.7)	Information preference dimension	2	6.15 ± 1.91
	Bachelor's	440 (50.2)			
	Master's	106 (12.1)			
Employment status	Yes	679 (77.4)			
	No	198 (22.6)			
Household registration	Agricultural	291 (33.2)			
	Non-agricultural	586 (66.8)			
Marital status	Married	695 (79.3)			
	Unmarried	145 (16.5)			
	Divorced	21 (2.4)			
	Widowed	16 (1.8)			

IBRS, Identity Bubble Reinforcement Scale; WHO-5, World Health Organization Five-item Well-being Index.

Table 2. Correlation Analysis of General Self-Efficacy, Happiness Index, and Identity Bubble Reinforcement (r-value, n=877)

Scale	1	2	3	4	5
1. General Self-Efficacy Scale	1				
2. WHO-5 Scale	0.575***	1			
3. Identity bubble Reinforcement Scale	0.380***	0.330***	1		
4. Social identity dimension	0.330***	0.307***	0.895***	1	
5. Homogeneity dimension	0.351***	0.289***	0.887***	0.637***	1
6. Information preference dimension	0.324***	0.275***	0.865***	0.688***	0.697***

*** $P < .001$, indicating significant correlation.

1 and Happiness Index 2 to revise the model. The indicators obtained showed that the hypothesized model fitted the data well: CMIN/DF = 2.911, RMR=0.040, RMSEA=0.047, GFI=0.976, NFI=0.986, TLI=0.987, and CFI=0.991. Analysis by AMOS 23.0 (IBM SPSS Corp.; Armonk, NY, USA) (Table 3) indicated that the direct effect of identity bubble reinforcement on the happiness index had a 95% CI of 0.031-0.142, with the upper and lower limits excluding 0 and statistical significance ($P=.015$), confirming the presence of a direct effect. The 95% CI for the mediation effect of general self-efficacy among medical staff was 0.125-0.212, with the upper and lower limits excluding 0 and statistical significance ($P=.005$), confirming a mediation effect. Thus, the general self-efficacy among medical staff mediates between social media identity bubble reinforcement and the happiness index.

As shown in Table 3, high general self-efficacy among medical staff plays a mediating role between social media identity bubble reinforcement and the happiness index. We then investigated the mutual influence of the variables in each dimension. The social identity, homogeneity, and information preference dimensions of identity bubble reinforcement were incorporated into the model diagram (Appendix 1). The results (Appendix 2) indicated that the social identity and information preference dimensions of identity bubble reinforcement among medical staff had a direct effect on the happiness index with 95% CIs of 0.037-0.115 and 0.018-0.108, respectively, with the upper and lower limits excluding 0 and statistical significance levels ($P=.009$ and $P=.011$, respectively), confirming the presence of

a direct effect. The 95% CI for the mediation effect of general self-efficacy among medical staff on the social identity and information preference dimensions of identity bubble reinforcement were 0.083-0.138 and 0.099-0.170, respectively, with the upper and lower limits excluding 0 and the statistical significance levels $P=.005$ and $P=.007$ respectively), confirming the mediation effect. Thus, general self-efficacy plays a mediating role between the social identity dimension, information preference dimension, and the happiness index in the identity bubble reinforcement of medical staff. The homogeneity dimension of identity bubble reinforcement among medical staff had a 95% CI for the direct effect on the happiness index of -0.002-0.080, with the upper and lower limits including 0, indicating no statistical significance ($P=.063$), suggesting that the direct effect is not valid, while the 95% CI for the mediation effect of general self-efficacy among medical staff in the homogeneity dimension of identity bubble reinforcement was 0.093-0.164, with the upper and lower limits excluding 0, indicating statistical significance ($P=.012$), confirming the mediation effect, which fell under complete mediation.

Discussion

Medical professionals are a unique group who provide healthcare services and meet patients' needs. They are involved in saving lives and aiding the injured, necessitating a high sense of responsibility and often leading to pressures incomprehensible to the average person. Happy medical professionals are not only a valuable resource for an organization

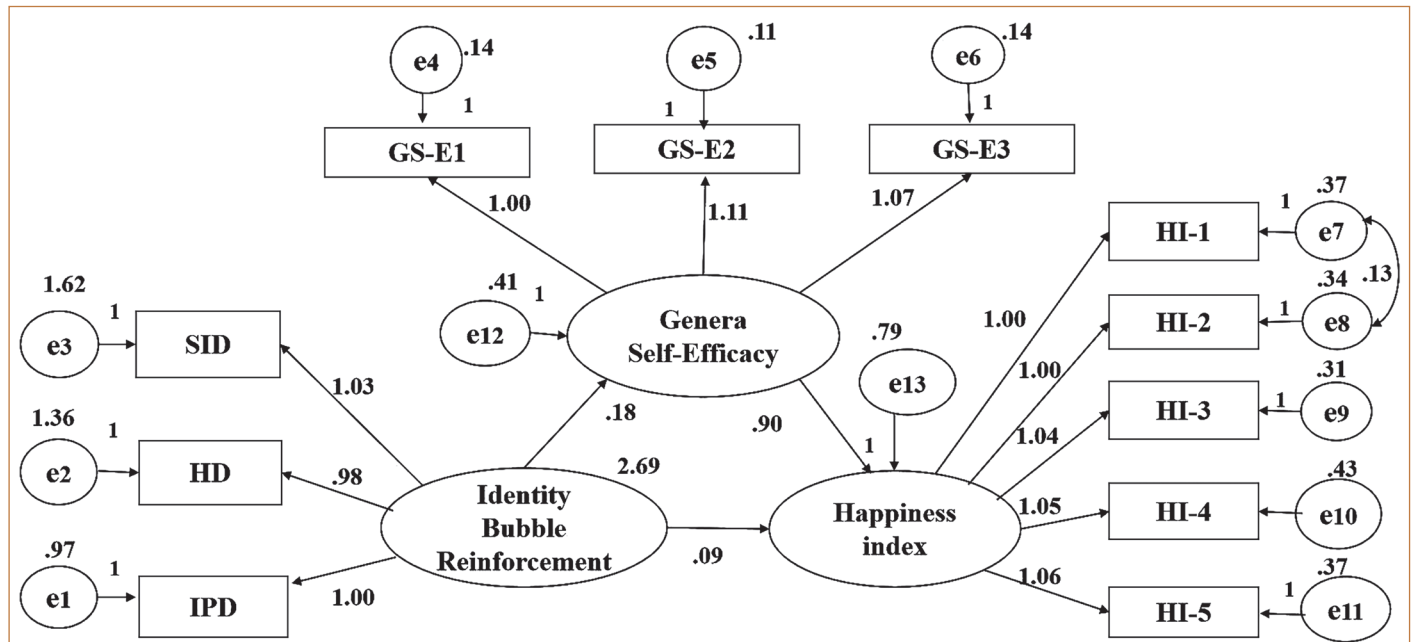


Figure 1. Fitting model of the mediating effect of general self-efficacy on identity bubble reinforcement and the happiness index. SID, social identity dimension; HD, homogeneity dimension; IPD, information preference dimension; GS-E-1, general self-efficacy 1; GS-E-2, general self-efficacy 2; GS-E-3, general self-efficacy 3; HI-1, Happiness Index 1; HI-2, Happiness Index 2; HI-3, Happiness Index 3; HI-4, Happiness Index 4; HI-5, Happiness Index 5.

but also a vital force in advancing medical reforms, as the happiness of healthcare workers is directly related to the quality of medical care.

The findings of this study support Hypotheses 1. Social media identity bubble reinforcement, as well as its dimensions of social identification, homogeneity, and information preference, was found to be positively associated with the happiness of medical staff. Social identity theory³⁰ posits that individuals are aware of their belonging to specific social groups, while also being aware of the emotional significance and value brought to them as members of the group; these social perceptions, attitudes, and behaviors constitute the basis of an individual’s subjective happiness. Social identity positively influences happiness, a conclusion that both supports and extends the research findings of Krysz et al,³¹ Hitokoto et al,³² Przybylski and Weinstein et al,³³ and Bailey et al.³⁴ Homogeneity was found to have a positive effect on happiness, consistent with the findings of Blum et al.¹⁵ Healthcare professionals with reinforced social media identity bubbles may experience positive emotions by engaging with like-minded friends in social media groups, thus reducing the likelihood of negative emotional experiences and increasing their overall happiness. Additionally, the preference for information in Chinese healthcare professionals with reinforced social media identity bubbles had a positive effect on their happiness. Under the influence of virtual communities and

algorithm-based information recommendations, information preferences can contribute to similar ways of thinking, fostering the mutual recognition of ideas, enhancing self-confidence, and increasing overall general self-efficacy. A study by Duchsherer et al³⁵ on breastfeeding found that information preference regarding breastfeeding affected self-efficacy, consistent with the present research results.

The results of the present study support Hypothesis 2. A positive association was found between the reinforced social media identity bubbles of medical staff and their self-efficacy. Medical staff with high levels of identity bubble reinforcement were more likely to experience positive energy in social media groups, cope effectively with challenges at work, possess higher levels of self-confidence, and experience higher general self-efficacy. The results of this study also support Hypothesis 3. There is therefore a positive correlation between the self-efficacy and happiness of medical staff, consistent with the findings of Blum et al.²⁰ The higher the general self-efficacy levels of medical staff, the greater their sense of engagement in their work, the more confident they are in facing challenges that arise in life, and the easier it is for them to derive satisfaction and happiness from both their life and work.³⁶⁻⁴⁰

The results of this study support Hypotheses 4. The general self-efficacy of Chinese medical staff was found to mediate between social

Table 3. Analysis of the Effect of General Self-Efficacy as a Mediating Variable on Identity Bubble Reinforcement and the Happiness Index of Medical Staff (n=877)

Effect	Path	Effect Value	SE	P	95% CI	Effect Proportion
Direct effect	Identity bubble reinforcement → Happiness index	0.086	0.025	.015	0.031-0.142	34.68%
Indirect effect	Identity bubble reinforcement → General self-efficacy → Happiness index	0.162	0.021	.005	0.125-0.212	65.32%
Total effect	Identity bubble reinforcement → General self-efficacy → Happiness index	0.248	0.030	.010	0.181-0.313	

CI, confidence interval.

media identity bubble reinforcement, as well as its society identity and information preference dimensions, and the happiness index. According to social identity theory, medical professionals with a high sense of social identity are more likely to perceive the positive aspects of life and work, and these positive emotions can help them overcome difficulties and pressures in work and life, resulting in a more positive attitude toward life and career, thus boosting their general self-efficacy⁴¹ and happiness.

Due to the professional specialization of medical personnel, the direction, content, and sources of their acquired knowledge have their own preferences. In virtual communities with consistent information preferences, thinking patterns are similar, and information of interest is shared within professional fields, which stimulates enthusiasm for work and life, mobilizes positivity, produces a positive psychological state, and increases self-efficacy and happiness. The general self-efficacy of medical staff was found to mediate between social media identity bubble reinforcement and the happiness index. Identity bubble reinforcement enhances individual self-efficacy, according to social identity theory, while the improvement in self-efficacy promotes goal achievement and enhances happiness according to Bandura's self-efficacy theory. This process also involves goal-setting and achievement motivation theories, as well as theories of subjective happiness.

The homogeneity principle constructs various types of network relationships, including friendships, work, information transmission, communication, reunions, and other types of relationships.⁴² Due to the specialized nature of the work of medical personnel, interpersonal homogeneity has a significant effect on the type of information they receive, the attitudes they form, and the interactions they experience. If medical staff can develop close companionship and positive social networks at work, this is likely to benefit both their work efficiency⁴³ and identity, enabling increased work-related confidence and satisfaction, enhancing their self-efficacy,⁴⁴ and thus increasing their overall happiness. However, the homogeneity of interpersonal interactions may not affect the happiness index directly and often requires self-efficacy as a mediator. Therefore, general self-efficacy determines whether the homogeneity dimension can influence the level of happiness.

Previous studies have often tended to focus on the negative influences of identity bubble reinforcement in terms of social media. For instance, social media usage was found to increase the likelihood of adolescent gambling,⁴⁵ and identity bubble reinforcement was found to be associated with higher levels of psychological distress,⁴⁴ fatigue, and stress.¹⁵ However, the findings of the present study demonstrate more positive effects. Among healthcare professionals, reasonable use of social media and identity bubble reinforcement was found to influence the level of happiness both and indirectly through the mediation of general self-efficacy.

Limitations and Future Research

This study has several limitations. First, the sample size was small, most of the participants were female and only focused on healthcare professionals in China, thus potentially limiting the generalizability of the findings. Secondly, the data collected on general self-efficacy, happiness index, and identity bubble reinforcement levels were self-reported by the participants, which might have limited the accuracy and validity of the information. Additionally, there were relatively few objective measurement tools available for the survey. Lastly, the cross-sectional design only allowed for the establishment

of correlations, making it difficult to determine causal relationships and dynamic changes among general self-efficacy, happiness index, and identity bubble reinforcement. Nevertheless, the findings of the study provide insights for hospital managers to improve the happiness of healthcare professionals. In future research, we will focus on studying feasible intervention strategies to effectively enhance the happiness of healthcare professionals.

This study found that the general self-efficacy of Chinese medical staff plays a mediating role between the reinforcement of social media identity bubbles and the happiness index. Hospital managers and policymakers should pay attention to the level of general self-efficacy among healthcare professionals and provide practical methods to enhance it, fully leveraging its mediating role to ultimately improve the happiness of medical staff.

Availability of Data and Materials: Data to support the findings of this study are available on reasonable request from the corresponding author.

Ethics Committee Approval: Ethical approval for this study was obtained from the Ethics Committee of the Shaanxi Provincial Center for Health Culture Research (JKWH-2022-02; Date: 25 May 2022). Prior to voluntary participation, the participants provided informed consent.

Informed Consent: Written informed consent was obtained from the subjects who participated in the study.

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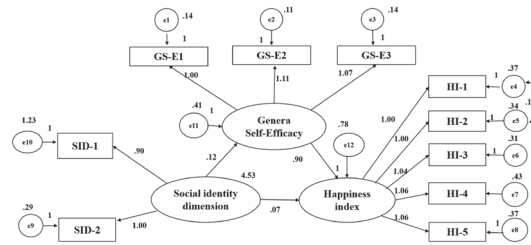
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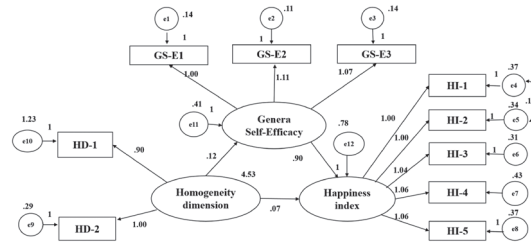
Appendix

Appendix 1: Fit Model of the Three Dimensions of Identity Bubble Enhancement



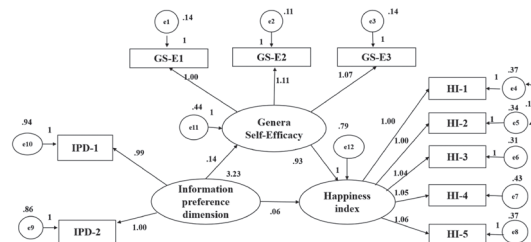
Note: SID-1, social identity dimension 1; SID-2, social identity dimension 2; GS-E-1, general self-efficacy 1; GS-E-2, general self-efficacy 2; GS-E-3, general self-efficacy 3; HI-1, Happiness Index 1; HI-2, Happiness Index 2; HI-3, Happiness Index 3; HI-4, Happiness Index 4; HI-5, Happiness Index 5

Figure 1. Fit model of the mediating effect of general self-efficacy between social identity dimension and happiness index.



Note: HD-1, homogeneity dimension 1; HD-1, homogeneity dimension 1; GS-E-1, general self-efficacy 1; GS-E-2, general self-efficacy 2; GS-E-3, general self-efficacy 3; HI-1, Happiness Index 1; HI-2, Happiness Index 2; HI-3, Happiness Index 3; HI-4, Happiness Index 4; HI-5, Happiness Index 5

Figure 2. Fit model of the mediating effect of general self-efficacy between the homogeneity dimension and the happiness index.



Note: IPD-1, information preference dimension 1; SID-2, information preference dimension 2; GS-E-1, general self-efficacy 1; GS-E-2, general self-efficacy 2; GS-E-3, general self-efficacy 3; HI-1, Happiness Index 1; HI-2, Happiness Index 2; HI-3, Happiness Index 3; HI-4, Happiness Index 4; HI-5, Happiness Index 5.

Figure 3. Fit model of the mediating effect of general self-efficacy between information preference dimension and the happiness index.

Appendix 2: Goodness-of-Fit and Effect Values of The Three Dimensions of Identity Bubble Reinforcement

Table 1. Fit of Each Dimension Path Diagram with Actual Data (n=877)

	Fit Index	CMIN/DF	RMR	RMSEA	GFI	NFI	TLI	CFI
Model	Fit Standard	<3	<0.05	<0.08 (Excellent if <0.05; Good if <0.08)	>0.90	>0.90	>0.90	>0.90
Figure1	Computed results	2.653	0.027	0.043	0.981	0.990	0.991	0.994
Figure 2		2.476	0.033	0.041	0.983	0.990	0.992	0.994
Figure 3		2.868	0.031	0.046	0.980	0.989	0.989	0.993

Table 2. Analysis of the Effects of the Mediating Variables of General Self-Efficacy of Medical Staff on Happiness Index in Various Dimensions of Identity Bubble Reinforcement (n=877)

Model	Effect	Path	Effect Value	SE	P	95% CI	Effect Proportion
Figure 1	Direct effect	Social identity dimension → Happiness index	0.071	0.019	.009	0.037-0.115	39.89%
	Indirect effect	Social identity dimension → General self-efficacy → Happiness index	0.107	0.014	.005	0.083-0.138	60.11%
	Total effect	Social identity dimension → General self-efficacy → Happiness index	0.178	0.002	.013	0.125-0.218	
Figure 2	Direct effect	Homogeneity dimension → Happiness index	0.039	0.021	.063	-0.002 to 0.080	
	Indirect effect	Homogeneity dimension → General self-efficacy → Happiness index	0.127	0.017	.012	0.093-0.164	
	Total effect	Homogeneity dimension → General self-efficacy → Happiness index	0.166	0.027	.009	0.110-0.231	
Figure 3	Direct effect	Information preference dimension → Happiness index	0.060	0.021	.011	0.018-0.108	31.58%
	Indirect effect	Information preference dimension → General self-efficacy → Happiness index	0.130	0.019	.007	0.099-0.170	68.42%
	Total effect	Information preference dimension → general self-efficacy → Happiness index	0.190	0.025	.010	0.136-0.241	