

## **Health education curriculum of SPHERE : Mathematical model of students' flu knowledge and learning behavior**

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### **Abstract**

The SPHERE denoting the Social Partner Hub of Emerging Resolution in Education, stands poised to enact a profound transformation within the educational landscape. This paradigm shift in focus is rooted in the pursuit of elevating the overall quality of life by systematically mitigating health risks within educational settings, particularly within densely populated educational institutions. Educational settings, typified by their close-knit communities of students, teachers, and staff, inherently harbor the potential for infectious disease outbreaks, thereby manifesting the looming specter of cluster cross infections. The concept of health promotion in this learning solution in school to facilitate the health of students, faculty & staff, and community residents and further enhance the quality of life.

The present study, which centers its investigation on high school students in Shanghai, represents an endeavor to empirically explore these multifaceted dynamics. A total of 420 questionnaires were judiciously disseminated among the targeted student population. After the meticulous elimination of invalid and incomplete responses, a total of 354 valid responses were retrieved, constituting a commendable retrieval rate of 84%. The research findings yield compelling insights by establishing remarkably positive correlations among three pivotal factors. Firstly, a discernible link emerges between the presence of a robust health education curriculum and the acquisition of flu knowledge. Secondly, a notable connection is established between flu knowledge and ensuing learning behaviors. Lastly, a synergistic relationship is discerned between the presence of a comprehensive health education curriculum and the shaping of learning behaviors.

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## 1. Introduction

The SPHERE framework under the Thailand Science Research and Innovation, acronym for Social Partner Hub of Emerging Resolution in Education aspired by Sustainable Development Goals 2030 agenda, in particularly health and well-being for all age groups. [19], [12] Along with the global landscape, the paradigm of health promotion is gaining momentum as a proactive measure to safeguard the well-being of students, faculty, staff, and the broader community. It poised to redefine the educational landscape by addressing the critical nexus between health, education, and the challenges faced by densely populated educational institutions. Schools, serving as tightly-knit communities of students and teachers, inherently harbor the potential for infectious disease outbreaks, creating the specter of cluster cross infections. This shift in focus seeks to enhance the quality of life by mitigating health risks within educational settings.

The SPHERE, with its collaborative and holistic approach to education, is ideally positioned to facilitate the integration of health education within the curriculum. It serves as a conduit for the exchange of knowledge, resources, and best practices, ultimately contributing to the creation of healthier, more resilient educational communities prepared to face the challenges of the 21st century. In this context, schools represent not only centers of learning but also crucibles where students' health status profoundly influences their learning experiences and overall quality of life. The susceptibility of students to infections, owing to relatively weaker immunity and close interactions with their peers, underscores the risk of cross infections within these educational hubs. It is imperative to recognize that the emergence of infectious diseases within the school environment can pose significant threats to students' health.

Appeared in the World Health Organization promulgated Ottawa Charter, the concept of health promotion is promoted in activities in the world. So far, most schools have joined in health promotion to promote school health policies and teaching activities, combine community development projects to facilitate the health of students, faculty & staff, and community residents, and further promote the quality of life. A serious disease, severe acute respiratory syndrome, was experienced in 2003; without any pandemic experiences and preparations, the pandemic was rapidly spread to seriously affect domestic economy, society, and health care. The outbreak of influenza A(H1N1) in the US and Mexico in 2009 resulted in global panic, and 2019 Covid Pandemic. Domestic people

could not escape from the pandemic which became another serious and large infectious disease. Unfortunately, the virus did not disappear but was still epidemic with the form of seasonal influenza virus. The threat of pandemic influenza in the future would still exist domestically. Convenient transportation accelerates the spread of epidemic diseases and enhances the breeding and spread of emerging infectious diseases. From the history, it is understood that pandemic diseases are the major threat to human death. In face of fulminating communicable diseases, pandemic cannot be correctly predicted the occurrence, while the harm is getting serious. Globalized and modernized lifestyles would worsening the threat of infectious diseases.

Flu, as an acute respiratory infectious disease, presents the characteristics of fast outbreak, broad spread coverage, and serious complications. Besides, flu virus can easily appear variation to break out the pandemic and hugely threaten people's health. Among all diseases, "flu" is fast and would result in serious situations. Flu, with much variation and strong infectivity, would easily infect crowds unconsciously; it is more significant on campus. A school is a densely populated group with numerous close-contact teachers and students. Once there are infectious diseases, it could easily appear cluster cross infection. A school is the most important and dense learning place for students; students' health status is closely related to learning situation and quality of life. Nevertheless, students show weaker immunity but closer interaction with peers, and cross infection could easily appear on close people. Once infectious diseases intrude campuses, it could easily induce cluster infectious diseases to hugely threaten students' health. It presents the importance to cultivate students' correct concept and knowledge and arouse people's emphasis on health. Domestic health education presents short class time, and the curriculum content does not match students' life experience; in school education, it is not much concerned and does not form a systematic curriculum to correctly guide students to acquire health education related knowledge and skills. Accordingly, the effect of health education curriculum on students' flu knowledge and learning behavior is discussed in this study, expecting to help schools precede systematic health education curriculum and construct students' correct concept to learn to protect themselves and prevent the occurrence of diseases as well as promote personal health.

## Literature review

### *I. Health education curriculum and flu*

Jia et al. [8] indicated that pandemic influenza would affect national life and health and result in social and economic pressure and disorder. Domestic overall objectives for pandemic influenza prevention & control contain the followings. 1. Continuous monitoring: To keep an eye on the development of international pandemic as well as continuously monitor domestic viruses, mild or severe complication cases, and cluster events to prevent the spread of pandemic in the early stage. 2. Preventing from infection: Novel flu viruses imported from abroad are fully contained to avoid further domestic infection. 3. Reducing injury: When the infectivity of novel flu viruses is enhanced to become human viruses, health care and public health would positively intervene to reduce national health loss and maintain the continuous operation of social functions and economic activities. 4. Executing recovery: After the end of pandemic, social-psychological recovery and economic recovery plans are developed. Huu et al. [7] mentioned that good health habits should be cultivated through school education and activity to enhance the health of students and faculty & staff; it was the responsibility and obligation of a school, in which teachers had to protect children's physical and mental health, without being damaged. The objective of health education did not simply deliver health knowledge, but the positive objective was to facilitate public positive health behaviors through teaching-learning process. Wen et al. [20] stated that covering personal and community health cognition, changing attitudes to enhance behavior changes, and seeking health improvement methods in health promotion were main objectives of school education. To stop the occurrence of infectious diseases on campus, schools should cooperate with health units to conduct infectious disease prevention & control and students' vaccination. To avoid pandemic spread, schools could have students and faculty & staff understand the prevention & control information of infectious diseases through health courses or promotion to maintain the health and cultivate good health habits.

Kwon et al. [9] proposed the cultivation of healthy people as the final goal of national education that people should present good fitness to bear the task in the new age. According to the viewpoint of fitness, American Association of Health Physical Education (AAHPERD) proposed the holistic concept of health and considered five well-beings of complete health.

1. Physical fitness: including understanding physical development and physical care and developing positive attitude and ability of physical activity.
2. Emotional fitness: containing clear thinking, stable emotion, successful stress adjustment, and self-control and autonomy ability
3. Social fitness: covering concerns about spouse, family members, neighbors, colleagues, and friends, positive interaction with other, and development of friendship.
4. Spiritual fitness: including search for personal life meaning, setting life goals, and ability of loving people and being loved.
5. Cultural fitness: containing the contribution to the improvement of community life, concerning about cultural and social events, and accepting responsibility for public affairs.

## **II. Research hypothesis**

Health education, as described by Liu et al. [10], is a dynamic process of teaching and learning. Its primary goal is to facilitate the acquisition of health-related knowledge through effective information exchange. This process aims to influence individuals' attitudes and encourage the adoption of health-promoting behaviors and lifestyles. Health education is not limited to a specific demographic; it can target anyone. Moreover, those who possess accurate health information and maintain a positive outlook can become educators themselves, influencing and assisting others in their health journey. Rivera et al. [14] proposed to understand current curricula, guide children to build self-care ability and correct concept of seeking medical advice to prevent the occurrence of diseases, as well as understand the prevention and treatment of diseases to promote immunity, through health courses. Teachers, before selecting and changing the considerations, could integrate school-based characteristics, students' background knowledge and structure, and curriculum pacing and promotion into various learning fields. Azli et al. [1] suggested that health education curricula, through teaching contents, could understand contemporary socially concerned issues and timely remind students to pay attention to life problems. Learners could enhance self-development, life management, social participation, and life practice ability to protect themselves and environment through the mental and behavioral experience, reflection, and practice. DiNardo & Downs [4] mentioned that students were lack of "novel influenza A(H1N1)" related knowledge; after

the health education curricula in schools, students, regardless age, gender, ethnic group, family composition, and parents' age and education background, significantly enhanced the cognition in posttest, compared to it in pretest. The importance of health education curriculum in schools was apparent. The following hypothesis is therefore established in this study. Health education curriculum reveals significantly positive correlations with flu knowledge (H1).

Yu et al. [21] stated that the rapid spread of novel influenza A(H1N1) panicked many students who worried about the infection. Most students would change the living habits due to novel influenza that students' changes in behavior and cognition were correlated with the emergence of novel influenza pandemic. By referring to domestic curriculum mapping and matching domestic current situations, Marchetti et al. [11] designed the curriculum to be closer to practical life to cultivate students' immunity against flu and further preceded systematic teaching with the ability of preventing flu to cultivate students' complete and useful knowledge and ability through flu prevention & control education and to further change the behaviors. Boo [2] considered that maintaining and enhancing the health of students and faculty & staff through education and activity was the responsibility and obligation of schools; the cultivation of good living habits through the teaching and promotion of health education curriculum was also the major objective of school education. Fernandez et al. [5] proposed that schools should actively cooperate with health units to conduct health education curricula to stop the occurrence of campus infectious diseases; schools should provide infectious disease prevention & control information for students and faculty & staff through health education curricula or relevant activities to avoid pandemic spread in order to enhance the learning of health behavior. This study proposes the following hypothesis: There is a significant positive correlation between flu knowledge and learning behavior (H2).

Song, Guo, and Zhang [17] stated that health education curriculum content mainly guided students to discuss the causes of diseases through flu cases so as to understand that many diseases could be prevented by health behavior and prevention measures; besides, the sharing of experience in seeking for medical advice could assist students in establishing self-care ability and correct concept of seeking for medical advice. Coswig et al. [3] mentioned that arranging proper teaching situations and materials, according to competence indicators, to precede effective teaching activity and facilitate students' learning could enhance the knowledge and cultivate the problem-solving ability. Serre, Busuttil,

and Botto [15] proposed that, in order to comprehensively enhance the quality of health education, teachers, with the special teaching ability and teaching performance, had to understand students' learning needs and learning behaviors to affect students' learning interests and promote the learning outcome. Park et al. [13] mentioned that major caregivers should enhance the cognition of flu; kindergartens and governmental agencies could precede health education curricula through various channels to help the learning of flu prevention & control. Based on this, the study puts forth the following hypothesis: There is a substantial positive correlation between health education curriculum and learning behavior (H3).

The profound impact of the health education curriculum on students' flu knowledge, and in turn, the influence of flu knowledge on their learning behavior. Furthermore, it highlights the reciprocal relationship between the health education curriculum and learning behavior.

## Research method

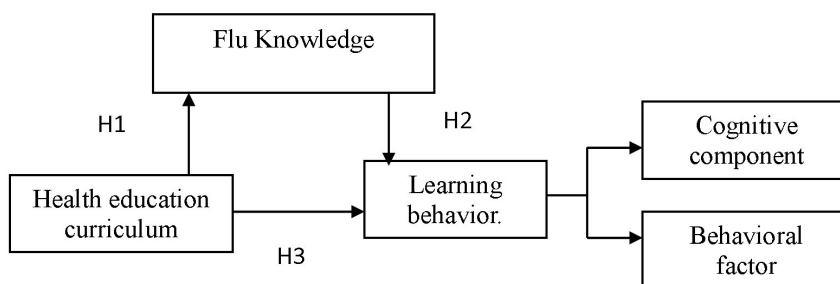
### I. Conceptual architecture of this study

Drawing from the preceding literature review, this study proposes a conceptual framework (Figure 1) to examine the relationships among health education curriculum, flu knowledge, and learning behavior.

### II. Operational definition

#### (1) Health education curriculum

Referring to Shin et al. [16], health education is regarded as the education action and cognition to educate individuals maintaining or



**Figure 1**  
Conceptual architecture

promoting health as well as self-realization and self-content. The following dimensions are covered.

1. Health responsibility: including paying attention to personal health, discussing health care with health professionals, and participating in health care related activities.

The questionnaire items for dimensions contain the followings.

- (1) After the health education courses, I start my health.
- (2) After the health education courses, I start to discuss about health care with professionals.
- (3) After the health education courses, I start to participate in health care related activities.

2. Physical activity: referring to exercise and creation activities. Regular exercises could improve muscular strength and posture, control weight, reduce anxiety and nerve, as well as enhance relaxation.

The questionnaire items for dimensions contain the followings.

- (1) After the health education courses, I start to engage in sports and leisure activities.
- (2) After the health education courses, I start regular exercises.
- (3) After the health education courses, I start to control weight.
- (4) After the health education courses, I start to reduce anxiety and nervousness.
- (5) After the health education courses, I start to relax.

3. Spiritual growth: containing life with objectives, moving towards personal goals, being optimistic about life, and presenting self-awareness and the feeling of positive growth.

The questionnaire items for dimensions contain the followings.

- (1) The health education courses give me objectives in my life.
- (2) The health education courses have me develop towards personal goals.
- (3) The health education courses have me be optimistic about life.
- (4) The health education courses give me self-awareness and positive growth.

## (2) Flu knowledge

Referring to Guo et al. [6], the following dimensions are included in flu knowledge.

### 1. Disease awareness: cognition of preventing and reducing diseases

The questionnaire items for dimensions contain the followings.

- (1) Fever is the common symptom of influenza.
- (2) Influenza mostly occurs in summer and fall.
- (3) Influenza vaccination could prevent from influenza.
- (4) Catching influenza for one time, it would not be caught afterwards.
- (5) Influenza has an incubation period of 1-4 days.
- (6) Vaccines are currently available to prevent influenza.

### 2. Importance of health: meaning of health to individuals.

The questionnaire items for dimensions contain the followings.

- (1) Five steps to wash hands: wet→rub→rinse→clean→wipe.
- (2) Tightly closing doors and windows to avoid air circulation could prevent from influenza.
- (3) Drugs could be used for controlling early symptoms of influenza.
- (4) The use of masks and bleach could prevent from influenza.
- (5) People with fever can go to school.
- (6) When washing hands, it is necessary to seriously rub hands for at least 20 seconds, and then clean with water.

## (3) Learning behavior

This study, following Tu et al. [18], incorporates two dimensions of learning behavior.

### 1. Cognitive component: referring to individual knowledge and perception of the attitude target and various information sources of the learning behavior.

The questionnaire items for dimensions contain the followings.

- (1) I would change some behaviors due to the appearance of influenza epidemic, e.g. reducing going to crowded places.

- (2) I would start to concern my physical conditions due to the appearance of influenza.
  - (3) I would frequently pay attention to new reports about influenza and epidemic.
  - (4) I would pay attention to the information for influenza vaccination every year.
  - (5) I would actively learn influenza related knowledge.
  - (6) I would wear mask when accessing closed and crowded public places.
2. Behavioral factor: referring to individual specific behavior or action for the learning behavior.

The questionnaire items for dimensions contain the followings.

- (1) After the government announcing the influenza vaccination, I would arrange the vaccination time for my family and myself.
- (2) During the influenza season, I would immediately see a doctor when there are flu-like symptoms.
- (3) When I am sick, I would take rest as much as I can and reduce the interaction with family.
- (4) I follow the 5 steps of washing hands and last for more than 20 seconds.
- (5) I have enough sleep for more than 8 hours every day.
- (6) When there is fever symptom, I would ask for a leave and rest at home.

### **Research object**

The study surveyed high school students in Shanghai as the research sample, distributing 420 questionnaires. After excluding invalid and incomplete responses, a total of 354 valid questionnaires were collected, resulting in a response rate of 84%.

### III. *Analysis method*

This study employs structural equation modeling to investigate the relationships among health education curriculum, flu knowledge, and learning behavior.

After retrieving the questionnaire, the following analysis tools are used in this study.

1. Factor analysis

To prove the applicability of the scale, the variables are preceded factor analysis, and orthogonal rotation is selected for seeking the optimal loads of themes under different factors.

2. Reliability analysis

Cronbach's  $\alpha$  is used for testing components to measure the internal consistency among variables. The higher  $\alpha$  reveals the higher internal consistency among variables in components.

3. Correlation analysis

Correlation analysis is applied to discuss the linear correlations between two continuous variables (X, Y). The higher absolute correlation coefficient between such two variables reveals the larger covariance. Generally speaking, when two variables appear positive correlations, Y would increase with increasing X. On the contrary, Y decreases with increasing X when negative correlations appear between such two variables.

$$r(x, y) = \frac{COV(x, y)}{SxSy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$$

4. Structural equation modeling

Structural equation modeling (SEM) is the statistics to analyze causal pattern, and path analysis (PA), factor analysis, regression analysis, and analysis of variance could also be preceded. Structural equation modeling could deal with the relations among various variables at the same time, and provide researchers with opportunities to change exploratory analysis into confirmatory analysis.

$$SEM = CFA + PA$$

H: Latent endogenous variable y

Ξ: Latent exogenous variable x

$\zeta$ : Interference (error of latent  $y$ )

$\beta$ : coefficient matrix of latent endogenous variable; coefficient of  $\eta_i$  and  $\eta_j$

$\Gamma\gamma$ : coefficient matrix of latent exogenous variable; coefficient of  $\eta_i$  and  $\xi_i$

$\Phi$ : Covariance matrix of latent endogenous variables

$\Psi$ : Covariance matrix among error of latent endogenous variables

### Structural equation

$$\begin{aligned}\eta &= \beta\eta + \gamma\xi + \zeta\eta - B\eta = \Gamma\xi + \zeta \\ (I - B)\eta &= \Gamma\xi + \zeta \\ \eta &= (I - B)^{-1}(\Gamma\xi + \zeta) \\ \eta &= B\eta + \Gamma\xi + \zeta \text{ or } \eta = (I - B)^{-1}(\Gamma\xi + \zeta) \\ \begin{bmatrix} \eta_1 \\ \eta_m \end{bmatrix} &= \begin{bmatrix} 0 & \beta_{12} & \cdots & \beta_{1m} \\ \beta_{21} & \ddots & & \vdots \\ \vdots & & \ddots & \beta_{m-1,m} \\ \beta_{m1} & \cdots & \beta_{m,m-1} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \vdots \\ \eta_m \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \cdots & \gamma_{1n} \\ \vdots & \ddots & \vdots \\ \gamma_{m1} & \cdots & \gamma_{mn} \end{bmatrix} \begin{bmatrix} \xi_1 \\ \vdots \\ \xi_n \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \vdots \\ \zeta_m \end{bmatrix} \\ \eta_i &= (\cdots + \beta_{i(i-2)}\eta_{i-2} + \beta_{i(i-1)}\eta_{i-1}) + (\gamma_{i1}\xi_1 + \gamma_{i2}\xi_2 + \cdots + \gamma_{in}\xi_n) + \zeta_i\end{aligned}$$

### Analysis and discussion

#### I. Factor analysis

Factor analysis results, as shown in Table 1, reveal that the health education curriculum scale is composed of three factors: “health responsibility” (eigenvalue = 3.627,  $\alpha = 0.87$ ), “physical activity” (eigenvalue = 2.588,  $\alpha = 0.85$ ), and “spiritual growth” (eigenvalue = 2.046,  $\alpha = 0.82$ ). The cumulative explained variance for this scale reaches 73.557%. The flu knowledge scale is comprised of two factors: “disease awareness” (eigenvalue = 2.783,  $\alpha = 0.84$ ) and “importance of health” (eigenvalue = 2.321,  $\alpha = 0.86$ ), with a cumulative explained variance of 76.239%. Lastly, the learning behavior scale consists of two factors: “cognitive component” (eigenvalue = 4.623,  $\alpha = 0.928$ ) and “behavioral factor” (eigenvalue = 3.162,  $\alpha = 0.91$ ), achieving a cumulative explained variance of 77.583%.

**Table 1**  
**Factor analysis**

| Variable                    | Dimension             | Eigenvalue | $\alpha$ | Cumulative variance explained |
|-----------------------------|-----------------------|------------|----------|-------------------------------|
| Health education curriculum | health responsibility | 3.627      | 0.87     | 73.557                        |
|                             | physical activity     | 2.588      | 0.85     |                               |
|                             | spiritual growth      | 2.046      | 0.82     |                               |
| Flu knowledge               | disease awareness     | 2.783      | 0.84     | 76.239                        |
|                             | importance of health  | 2.321      | 0.86     |                               |
| Learning behavior           | cognitive component   | 4.623      | 0.92     | 77.583                        |
|                             | behavioral factor     | 3.162      | 0.91     |                               |

## II. Correlation analysis

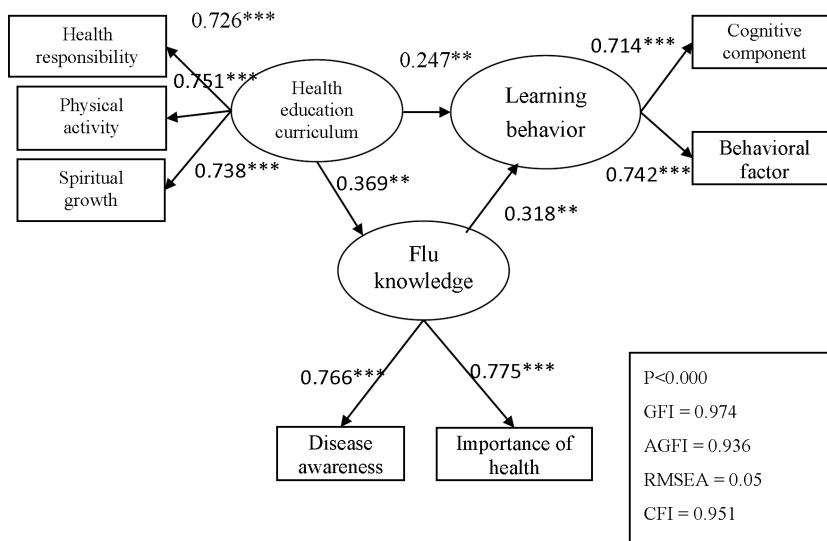
Table 2 demonstrates significant correlations among health education curriculum, flu knowledge, and learning behaviour. These strong correlations suggest the potential presence of multicollinearity. As recommended by scholars, this issue can be addressed using a nested model approach. Furthermore, the substantial correlations observed between dimensions align with the researchers' hypotheses.

**Table 2**  
**Correlation analysis**

| Research dimension          | $\alpha$ | Health education curriculum | Flu knowledge | Learning behavior |
|-----------------------------|----------|-----------------------------|---------------|-------------------|
| Health Education Curriculum | 0.84     |                             |               |                   |
| Flu Knowledge               | 0.85     | 0.37**                      |               |                   |
| Learning Behavior           | 0.91     | 0.25**                      | 0.32**        |                   |

## III. Discussion of theoretical model

Figure 2 illustrates the overall research findings. In this study, significant path coefficients are represented by solid lines, while non-significant ones are depicted with dotted lines. All path coefficients between variables are found to be significant, indicating that they achieve



**Figure 2**  
**Path diagram**

convergent validity and meet the fundamental requirements of the analysis model. The theoretical model's fit indices (GFI=0.974, AGFI=0.936, RMSEA=0.05, and CFI=0.951) demonstrate the goodness of fit of the research model. These indices suggest that the model aligns well with the theoretical framework and possesses validity.

#### IV. Discussion of research hypothesis

This study employs a nested model approach to test the hypotheses. A chi-square test is utilised, as each nested model differs by one degree of freedom. Significance is determined by comparing the chi-square value of the nested model to that of the theoretical model. When this difference is

**Table 3**  
**Nested model analysis**

| model                    | $\chi^2$ | $\Delta\chi^2$ | GFI   | CFI   | RMSEA |
|--------------------------|----------|----------------|-------|-------|-------|
| theoretical model        | 241.83   |                | 0.974 | 0.951 | 0.05  |
| Model 1: hypothesis test | 247.59   | 5.76*          | 0.974 | 0.951 | 0.05  |
| Model 2: hypothesis test | 252.50   | 4.91*          | 0.974 | 0.951 | 0.05  |
| Model 3: hypothesis test | 256.28   | 3.78*          | 0.974 | 0.951 | 0.05  |

**Table 4**  
**Hypothesis test**

| Research hypothesis | Correlations | Empirical result | P    | Result    |
|---------------------|--------------|------------------|------|-----------|
| H1                  | +            | 0.369            | 0.00 | supported |
| H2                  | +            | 0.318            | 0.00 | supported |
| H3                  | +            | 0.247            | 0.00 | supported |

significant, it indicates that the path coefficient set to 0 is significant. The research findings demonstrate that the model achieves significance. Table 3 presents the nested model analysis results, while Table 4 displays the hypothesis test outcomes.

### Discussion

Health education curricula center on students' life experience. The curriculum integrate problems in children's living environment into the teaching topics to induce students' attention and concern. Health is the basic element in life, while students stress more on specific thinking. In this case, epidemic flu is used as the guide to induce students' learning willingness and interests. With animation watching and discussions & presentation, students present high participation intention and enthusiastic discussions. Role playing allows students' direct participation. With group performance, the more topics are played, they are more familiar with the subject to perceive the importance of health and induce the mutual correlation between personal health and family & group life health. Meanwhile, the practice of epidemic prevention activities allows students "learning by doing" from the curriculum. Group report is designed in the health education curriculum. Students are impressive of the curriculum content and reveal the better effectiveness than didactic curricula. Nevertheless, it is slightly messy during students' group sharing. It is better to cultivate students making written reports. Furthermore, there are merely specific students preceding group discussion and data collection; a complete curriculum should be planned to achieve the effectiveness. In the health education curriculum, work appreciation allows students presenting self-feedback and understanding to make self-health management more positively, such as washing hands, balance diet, exercise, normal daily routine, and being close to the nature. Through the teaching with the health education curriculum, students would better cherish life and protect themselves.

## Conclusion

The research results show that health education curricula could enhance students' flu knowledge. The promotion of flu knowledge might be the reason that teachers, in the self-edited health education curricula, teach students about the cure and care of flu through pictures and photos and have students learn the steps and importance of correct hand washing with relevant knowledge and skills to make progress in the health education curriculum. Moreover, health education curricula could notably change students' learning behavior. It is discovered that students' learning behavior could be improved by teachers making changes in the health education curricula and parents building behavior at home for the continuous behavior. Teachers integrating students' life experience in each subject could actually help students. The connection between weekly subjects with life experience allows students understanding the learning and adjustment as well as preventing and facing flu with correction methods. Discussions and sharing among health education curriculum groups could achieve the idea of cooperative learning and learn more from the encouragement and brainstorming among classmates, in which students understand the change in behavior and living habits.

## Suggestion

According to the research results and findings, the following practical suggestions are proposed in this study.

1. Students are easily induced the interests in and discussions about the animation. In this case, current events and group discussion in the health education materials reveal students' concentration and active opinions in the learning process; especially in group presentation, students are enhanced the learning willingness and strengthened the flu prevention knowledge to enhance the learning effect. For this reason, diverse teaching media and methods could be applied to the design of health education curriculum to enrich the learning content and enhance students' attention to further reinforce the learning effect.
2. Current health education curricula are lack of teaching activity to share the sickness experience and the teaching units are few; some versions do not offer the instruction of infectious diseases. Life is education; textbooks for health and education learning should include flu related materials to be close to students' life experience.

In addition to learning knowledge, students should be able to practice the learned in life to build good health habits.

3. Flu diseases present high uncertainty on the occurrence time and seriousness and are hard to predict. Once the epidemic occurs, it could easily induce public panic. A school is a garden for students' friendly and happy learning that it is urgent to protect children's health. There are definite work division, response measures, material reserve, and constant meetings in the plan; besides, personnel training in organizations should be reinforced through seminars in order to deal with conditions. Dealing with various crises could be set usually in order to fully control the crisis. Anticipatory responses and on-site processing as well as maintaining the fluency of communication channels should be done in the crisis process. Crisis management mechanisms should be established to understand the crisis development and change process at any time. The actual practice of alert mechanism of "nipping in the bud" could really master the cutting point and the acting point for crisis prevention.
4. Within the current era, characterized by the intricate and swiftly advancing healthcare landscape, health literacy assumes unprecedented significance. This study seeks to investigate the case of students' flu knowledge within the health education curriculum and its influence on their learning behaviors. The implications of the findings in this study offer valuable globally insights suggested that schools embrace systematic health education curricula to foster students' understanding of health, disease prevention, and self-protection. By doing so, educational institutions can proactively safeguard the health and well-being of their student populations while promoting the concept of personal health. The SPHERE platform must proceed a support for a comprehensive 21st-century curriculum applicable across region wide, with a technology encapsulate text, voice over animation into a universal language for All. By integrating essential components of health education into the SPHERE platform, an encompassing educational environment will be established. This environment empowers learners with the requisite knowledge, skills, and attitudes essential for addressing emergent health concerns and actively participating in the resolution of health-related challenges, both within their local communities and on a broader scale.

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