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# Relationships of Self-leadership, Working Environment, and Professionalism among School Health Teachers

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**Purpose:** This study was conducted to examine the relationships of self-leadership, working environment, and professionalism, and to identify the factors that influence professionalism among school health teachers.
**Methods:** This study was a descriptive research study to identify the relationships of self-leadership, work environment, and professionalism among school health teachers. Data were collected from 198 people via an online survey using a structured questionnaire. The data were collected from February 7 to 24, 2023. The relationships of self-leadership, working environment, and professionalism were analyzed using multiple regression analysis.
**Results:** The score of self-leadership of school health teachers was 3.97 points out of 5, working environment was 3.28 points out of 5, and professionalism was 4.12 points out of 5. Professional accountability and competency development were influenced by behavioral strategies of self-leadership, cognitive strategies of self-leadership, and working environment. These variables explained 35.0% and 29.5% of professional accountability, respectively. Autonomy was influenced by age, cognitive strategy of self-leadership, and working environment, and these variables explained 19.2% of the variance of autonomy. Social recognition was influenced by behavioral strategy of self-leadership, and working environment, and these variables explained 28.0% of social recognition.
**Conclusion:** To enhance the professionalism of school health teachers, it is necessary to cultivate self-leadership that can overcome difficulties in work and properly self-criticize. Improving the working environment would help enhance the professionalism of school health teachers.

**Keywords:** School nurse; Health teacher; Leadership; Working environment; Professionalism

## Introduction

In Korea, school health teachers are nurses and health professionals at the same time, and they are professionals who have implemented health education and school health programs [1]. As a result of the spread of a novel influenza A (H1N1) virus in 2009 and a global pandemic of coronavirus disease 2019 (COVID-19), the professionalism and roles of health teachers for the prevention of the occurrence and spread of infectious diseases have been increasingly expanded [2]. Nevertheless, some health teachers still experience feelings of alienation and perceive their status as relatively low due to the perception of their identity as non-curriculum-based teachers and as teachers whose main duties are not teaching unlike other teachers [3], so they may show a low level of self-confidence at work [4]. In addition, Seo [5] reported that health teacher showed a high level of job stress due to the sense of duty and burden resulting from the perception that they should possess professional competencies and qualities required of both healthcare professionals and teachers. In view of this situation, it is very important to investigate health teachers' perceptions about their occupation and professional roles.

Professionalism refers to 'what a person thinks of his or her job

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as a profession', and it is a systematic view about one's job as a profession [6]. Therefore, health teachers' professionalism is the concept that represents the sum of all the beliefs, ideas, and impressions that health teachers have about their occupation as a profession and their job duties [7]. Unlike general teachers, based on their educational attainment in the fields of medicine and education, health teachers are healthcare professionals as stipulated by the Medical Service Act and also hold a teacher certificate, and their professionalism is based on the characteristics of healthcare professionals and teachers [8]. Specifically, the subfactors of professionalism of health teachers include professional accountability, autonomy, and competency development, and social recognition. Professional accountability is a comprehensive concept that includes health teachers' sense of calling, pride, and professional performance regarding their occupation. Autonomy refers to health teachers' independent judgements and autonomy in handling and performing their duties, and competency development refers to health teachers' developing job competency to maintain and develop of their profession. Lastly, social recognition is related to social perceptions about health teachers and the recognition of people around them [4].

There have been a number of studies on professional attitude, which is a similar concept to professionalism. The professional attitude of health teachers refers to their values and attitude that lead them to recognize the importance of professional consciousness based on fundamental values in health services as professionals, show professional aspects in individual behavior and thinking, and have a positive image [9]. This concept is closely related to the professionalism of health teachers, which includes the overall beliefs about the work of health teachers. In a study of professional attitude among health teachers, Yoo et al. [9] reported that there was a significant correlation between job competency and professional attitude among health teachers. According to a prior study on professionalism among nurses, who are related to health teachers, as the level of nursing professionalism increased, the level of job satisfaction showed a significant increase [10]. Also, a study of perioperative nurses reported that a high level of professionalism was associated with a higher level of organizational commitment among nurses [11]. In addition, nursing professionalism was shown to have a positive correlation with job satisfaction and turnover intention [12]. As demonstrated by previous studies, since a high level of professionalism leads to the increase of job competency and job satisfaction among health teachers, it can be seen as an important factor that may have a positive impact on the health promotion of students, so it is necessary to pay attention to and investigate professionalism among health teachers [4,9,10,13].

Self-leadership is the process of setting the direction of one's life and influencing oneself [14], and it is a comprehensive concept that includes emotions, ways of thinking, and behavioral strategies to influence oneself. If individuals have a high-level of self-leadership, it will lead to the emphasis of autonomy that enables individuals to set goals to accomplish on their own, also determine the reward for the achievement of a goal for themselves, and conduct self-criticism when they fail to achieve goals [15]. Thus, a high-level of self-leadership will lead to the improvement of professionalism. In particular, since health teachers have many opportunities to exert leadership as well as the coping capacity for prompt response, and perform duties involving face-to-face contact with patients, they are required to have self-leadership as leaders of the organization [16]. In a literature review study of self-leadership, Won & Cho[16] reported that a higher level of self-leadership was linked to higher age, higher education level, higher job position, and longer clinical career, and self-leadership was found to influence organizational commitment among nurses. Recently, in the field of nursing science, research on self-leadership has started to be conducted with the increase of interest in self-leadership [16], so there is a need to conduct research on the relationships self-leadership and professionalism among health teachers.

A working environment refers to the overall working environment that allows health teachers to perform their roles efficiently [17], and this concept includes interactions with members as perceived by individuals and aspects of policies influencing job duties as well as objective work situations and the physical environment [18]. Above all, the working environment of teachers is an important factor that allows teachers to maintain their physical and mental health while performing their roles with self-esteem. It has been shown that when health teachers encounter difficulties or obstacles at work, they may perceive their level of professionalism as low, depending on the working environment of schools [19,20,21]. Similarly, a previous study of early childhood teachers [22] found that excessive workload and poor working conditions acted as obstacles to the improvement of teachers' qualifications and the development of their professionalism.

In Korea, there have been few studies on the professionalism of health teachers, and no research has been conducted to consider self-leadership and working environment as factors directly influencing professionalism and examine their relationship with professionalism. In particular, when serious situations, such as periodically occurring outbreaks of emerging infectious diseases, occur, as the only health professionals in schools, health teachers

need to exert a high-level of self-leadership in a series of processes that include identifying the current situation on their own, setting goals, and carrying out their duties [32]. Meanwhile, in relation to attempts to help health teachers to perform their duties efficiently even in difficult situations, working environment has emerged as a very important factor. The working environment for health teachers includes support from people in charge of the management of the school and the clear specification of the division of duties. Therefore, this study aimed to examine the level of professionalism of health teaches and investigate the relationships of professionalism with self-leadership and working environment among current health teachers. This research also intended to provide basic data for the cultivation of professionalism needed for health teachers to faithfully perform their duties independently as the only healthcare professionals in schools.

## Methods

### 1. Study design

This study is a descriptive survey research to investigate the levels of self-leadership and working environment and examine their relationships with professionalism among health teachers.

### 2. Participants

The participants were health teachers who understood the purpose of this study and voluntarily gave informed consent to research participation. Since there are few previous studies on the professionalism of health teachers, the sample size was calculated considering the results of a related previous study on job identity and job stress among elementary school health teachers [23], which reported that job enthusiasm, job satisfaction, and school size explained 21.2% of job identity. The effect size is expected to be larger than the medium effect size ($f2 = 0.15$) presented by Cohen [24]. The G-power 3.1 program was used to calculate the sample size. The sample size for multiple regression analysis was calculated with 12 independent variables, a significance level of .05, a power of .95, and an effect size larger than the medium effect size ($f2 = 0.15$) to perform multiple regression analysis to analyze factors influencing professionalism. As a result, the minimum sample size was determined as 184 persons. In this study, considering a dropout rate of 10%, 198 persons participated in an online survey, and since there were no questionnaires with missing data such as non-responses or incomplete responses, all the data from a total of 198 respondents were included in the analysis.

### 3. Measures

*1) Self-leadership*

Self-leadership was assessed using a Korean modified version of the questionnaire developed by Manz [25]. The Korean version used in this study was created by Park [27] by remodifying a Korean modified version developed by Lee [26], who made it through the modification and complementation of the original questionnaire proposed by Manz [25]. The modified version proposed by Park [27] was used in this study after obtaining prior approval for the use of the tool. The tool used consists of a total of 16 questions about the two components of self-leadership such as behavioral strategies and cognitive strategies. The six subdomains of behavioral strategies are self-management, self-goal-setting, management by cues, rehearsal, self-reward, and self-criticism, and the two subdomains of cognitive strategies are natural reward and effective thinking. Each item is rated on a 5-point Likert scale, and higher scores indicate higher levels of self-leadership. Regarding the reliability of the tool, the value of Cronbach's α was reported as .880 in a previous study [27], and it was calculated as . 836 in this study.

*2) Working environment.*

Working environment was assessed using a modified version of the tool presented by Moon [30]. The assessment tool was used after obtaining approval for its use from the author and modifying and complementing it to suit the purpose of the study. Moon [30] created the tool by reconstructing the instrument used by Baek & Choi [28] and Park & Hwang [29]. The assessment tool used in this study is composed of a total of 16 questions about satisfaction with the school as the working environment, the relationship with the members of the school, duties and roles, and facilities and employee benefits. Regarding the reliability of the tool, the value of Cronbach's α was reported as .860 by the creator of the original tool, and it was calculated as .846 in this study.

*3) Professionalism*

The assessment tool for professionalism consists of a total of 20 questions. This tool was developed Kwon [4] through the verification of the reliability and validity of the tool, and this study used it after receiving approval from the developer. It is composed of 20 items on the following four subdomains of professionalism: professional accountability (11 questions), autonomy (3 questions), competency development (3 questions), and social recognition (3 questions). Although the original version of the tool was created as a 4-point scale, it was modified into a 5-point scale before using it in this study because most existing

assessment tools for professionals are developed in the form of 5-point scales [7,31], and some previous studies [32,33] pointed out the possibility that if there is no mid-point in a Likert-type scale, it will force respondents who cannot choose one side or those who have no attitude to express an attitude, and lead them to respond only positively or negatively about matters that they do not know well or lead them to think of socially desirable responses.

Each item on professionalism was rated on a 5-point Likert scale ranging from 1 point ( = 'Not at all (Strongly Disagree)') to 5 points ( = 'Very much (Strongly Agree)'), and higher scores indicate higher levels of professionalism. Regarding the reliability of the tool, the value of Cronbach's α was reported as .932 in a previous study [4], and it was calculated as .911 in this study.

*4) General characteristics of participants*

The general characteristics of participants were examined using a total of 9 questions about age, gender, education level, the length of career, form of school establishment, employment status, the number of students, and health class implementation.

### 4. IRB approval and data collection

This study was conducted after obtaining approval from the Institutional Review Board of Gachon University (IRB NO. 1044396-202211-HR-220-01). Data was collected from February 7 to 24, 2023 using a Naver online survey. The target population of this study were all the school health teachers in Korea. To induce the voluntary participation of health teachers, the researcher posted a recruitment notice including an online survey link on the websites of the Korean Teachers and Education Workers Union and the Korean Health Teachers Association after obtaining the consent and cooperation of the organizations. The questionnaire of this study included statements that specified the anonymity and confidentiality of the survey data, the possibility of withdrawal from participation in the survey at any time, and the use of research results for no other purposes than academic research, and the researcher collected the questionnaire data only from people who voluntarily gave consent to participate in the research. Respondents who participated in the survey were given a small gift as a token of appreciation. Since no questionnaires had incomplete responses, the questionnaires of a total of 198 respondents were all included in the analysis.

### 5. Data analysis

The collected data was analyzed using SPSS (version 26.0 for Windows; SPSS, Inc., Chicago, IL, USA). The general characteristics of participants were analyzed by calculating percentages and frequencies, and the levels of self-leadership, working environment and professionalism were analyzed by calculating means and standard deviations. The t-test and ANOVA were used to analyze differences in professionalism according to the general characteristics of participants, and the Scheffé's test was used for post hoc analysis. In addition, the analysis of relationships between self-leadership, working environment, and professionalism was conducted using Pearson's correlation coefficient. Additionally, to identify influencing factors for professionalism, multiple regression analyses were performed for each of the four subfactors of professionalism (professional accountability, autonomy, competency development, and social recognition) by entering each subfactor as the dependent variable. General characteristics that were identified as significant variables in univariate analysis, self-leadership, and working environment were entered as independent variables in regression analyses.

## Results

### 1. The level of professionalism according to the general characteristics of participants

The general characteristics and the levels of self-leadership, working environment and professionalism of participants are shown in Table 1. In terms of age, people aged less than 40 years (42.9%) accounted for the largest proportion of a total of 198 participants. The proportion of females was 98.5%. As to education level, four-year university graduates (67.7%) made up the largest proportion, and the mean length of career was 10.18 years.

Regarding school level, elementary schools (51.0%) accounted for the largest proportion, followed by middle schools (33.3%) and high schools (15.7%). In the case of form of school establishment, national or public schools (91.9%) made up the largest proportion. As for employment status, 76.8% of the participants were permanent teachers. In the number of students, the percentage of health teachers working in schools with 100 to 499 students was highest (40.4%). About 80% performed health classes.

The collected data was analyzed to identify the characteristics of participants that had a significant effect on the subfactors of professionalism: professional accountability, autonomy, competency development, and social recognition. As a result, it was found that there were significant differences in professional accountability according to age, gender, length of career, and school level. More specifically, the results of Scheffe's post hoc test showed that the ≥ 50 age group showed a higher level of profes-

**Table 1.** General Characteristics and Professionalism (*N*=198)

| Variables | Category | n(%) | Professionalism | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Professional accountability | | Autonomy | | Competency development | | Social recognition | | Total | |
| | | | M±SD | t/F (*p*) | M±SD | t/F (*p*) | M±SD | t/F (*p*) | M±SD | t/F (*p*) | M±SD | t/F (*p*) |
| Age (year) | < 40[a] | 85(42.9) | 4.24±0.43 | 9.22 (< .001) b < c | 4.16±0.66 | 5.38 (.005) b < c | 3.99±0.72 | 1.86 (.158) | 3.52±0.83 | 8.75 (< .001) b < c | 4.08±0.46 | 8.76 (< .001) b < c |
| | 40~49[b] | 62(31.3) | 4.16±0.49 | | 3.85±0.67 | | 3.97±.065 | | 3.51±0.53 | | 3.99±0.46 | |
| | ≥ 50[c] | 51(25.8) | 4.50±0.38 | | 4.19±0.57 | | 4.20±0.66 | | 3.98±0.51 | | 4.33±0.37 | |
| Sex | Male | 3(1.5) | 3.66±0.40 | -2.37 (.018) | 3.88±0.19 | -0.49 (.620) | 3.66±0.57 | -0.95 (.340) | 3.33±0.57 | -0.75 (.452) | 3.65±0.35 | -1.78 (.076) |
| | Female | 195(98.5) | 4.29±0.45 | | 4.08±0.66 | | 4.04±0.68 | | 3.64±0.70 | | 4.12±0.46 | |
| Education | Associate degree | 13(6.6) | 4.14±0.23 | 2.29 (.079) | 4.00±0.49 | 0.16 (.924) | 4.10±.058 | 0.619 (.603) | 3.74±0.70 | 0.576 (.632) | 4.05±0.31 | 1.36 (.254) |
| | Bachelor | 134(67.7) | 4.28±0.47 | | 4.08±0.65 | | 4.03±0.71 | | 3.61±.073 | | 4.11±0.48 | |
| | Master's degree | 46(23.2) | 4.37±0.47 | | 4.10±0.74 | | 4.09±.065 | | 3.70±0.61 | | 4.19±0.45 | |
| | Doctor's degree | 5(2.5) | 3.89±0.14 | | 3.93±0.14 | | 3.66±0.62 | | 3.33±0.52 | | 3.78±0.13 | |
| Career (year) | < 5[a] | 84(42.4) | 4.20±0.41 | 3.12 (.027) a < d | 4.05±0.59 | 1.66 (.176) | 3.93±.067 | 1.79 (.149) | 3.51±0.75 | 3.44 (.018) a < d | 4.03±0.41 | 3.44 (.018) a < d |
| | 5~9[b] | 37(18.7) | 4.39±0.49 | | 4.21±0.78 | | 4.18±0.69 | | 3.63±0.80 | | 4.22±0.53 | |
| | 10~19[c] | 47(23.7) | 4.23±0.52 | | 3.93±0.69 | | 4.02±0.74 | | 3.63±0.56 | | 4.06±0.50 | |
| | ≥ 20[d] | 30(15.2) | 4.45±0.38 | | 4.20±0.59 | | 4.21±0.59 | | 3.98±0.49 | | 4.31±0.37 | |
| School level | Elementary school[a] (including annex kindergarten) | 101(51.0) | 4.38±0.43 | 4.72 (.010) a > b | 4.09±0.61 | 1.56 (.213) | 4.09±0.63 | 0.58 (.557) | 3.72±0.64 | 1.62 (.199) | 4.19±0.43 | 2.73 (.067) |
| | Middle school[b] | 66(33.3) | 4.16±0.51 | | 4.14±0.68 | | 3.97±.074 | | 3.54±0.73 | | 4.04±0.52 | |
| | High school[c] (including special school) | 31(15.7) | 4.23±0.34 | | 3.89±0.71 | | 4.03±0.75 | | 3.55±0.79 | | 4.05±0.40 | |
| Form of school establishment | National/public | 182(91.9) | 4.28±0.46 | -0.33 (.739) | 4.09±0.66 | 1.01 (.311) | 4.04±0.69 | 0.39 (.696) | 3.62±0.70 | -0.91 (.364) | 4.12±0.46 | -0.08 (.932) |
| | Private | 16(8.1) | 4.32±0.39 | | 3.91±0.64 | | 3.97±0.67 | | 3.79±0.67 | | 4.13±0.43 | |
| Employment status | Permanent | 152(76.8) | 4.27±0.47 | -0.65 (.512) | 4.08±0.66 | 0.31 (.755) | 4.06±0.71 | 0.73 (.462) | 3.58±0.74 | -1.83 (.067) | 4.11±0.48 | -0.54 (.587) |
| | Temporary | 46(23.2) | 4.32±0.39 | | 4.05±0.65 | | 3.97±0.61 | | 3.80±0.50 | | 4.15±0.37 | |
| Number of students (person) | < 100 | 16(8.1) | 4.39±0.56 | 0.96 (.412) | 4.10±0.79 | 1.89 (.132) | 4.08±0.74 | 0.19 (.900) | 3.68±0.96 | 0.27 (.845) | 4.20±0.63 | 0.88 (.448) |
| | 100~499 | 80(40.4) | 4.31±0.42 | | 4.18±0.58 | | 4.07±0.69 | | 3.68±0.71 | | 4.16±0.43 | |
| | 500~999 | 73(36.9) | 4.27±0.48 | | 4.03±0.71 | | 3.99±0.74 | | 3.60±0.68 | | 4.09±0.49 | |
| | ≥ 1,000 | 29(14.6) | 4.17±0.42 | | 3.86±0.59 | | 4.05±0.50 | | 3.57±0.56 | | 4.02±0.35 | |
| Health class implementation | Conducted | 159(80.3) | 4.30±0.45 | 1.34 (.180) | 4.10±0.67 | 1.08 (.278) | 4.05±0.69 | 0.27 (.788) | 3.65±0.70 | 0.81 (.416) | 4.14±0.47 | 1.21 (.226) |
| | Not conducted | 39(19.7) | 4.19±0.46 | | 3.97±0.61 | | 4.04±0.66 | | 3.55±0.68 | | 4.04±0.43 | |
| Total | | | | | | | | | | | 4.12±0.46 | |

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sional accountability than the 40-49 age group (F = 9.22, $p < .001$), and females showed a higher level of professional accountability than males (t = -2.37, $p = .018$). Also, the group with a career of 20 years or more showed a higher level of professional accountability than the group with a career of less than 5 years (F = 3.12, $p = .027$). In terms of school level, elementary school health teachers showed a higher level of professional accountability than middle school health teachers (F = 4.72, $p = .010$). Secondly, as for autonomy, age had a significant effect on autonomy. The ≥ 50 age group showed a higher level of autonomy than the 40-49 age group (F = 5.38, $p = .005$). Finally, regarding social recognition, age and length of career had a significant influence on social recognition. The level of social recognition was significantly higher in the ≥ 50 age group than in the 40-49 age group (F = 8.75, $p < .001$), and the group with a career of 20 years or more showed a higher level of social recognition than the group with a career of less than 5 years (F = 3.44, $p = .018$) (Table 1).

### 2. The levels of self-leadership, working environment, and professionalism among participants

The level of self-leadership among the participants was 3.97 points out of 5. Regarding the subdomains of self-leadership, the scores for behavioral strategy and cognitive strategy were 4.05 points and 3.72 points, respectively. In addition, the score for working environment was 3.28 points out of 5, and the score for professionalism was 4.12 points out of 5. Among the subdomains of professionalism, professional accountability showed the highest score of 4.28 points. The score for autonomy was 4.07 points, and the score for competency development was 4.04 points. Social recognition showed the lowest score of 3.63 points among the subdomains of professionalism (Table 2).

### 3. Relationships between self-leadership, working environment, and professionalism among participants

With respect to the correlations of each subdomain of professionalism with other variables, professional accountability was significantly positively correlated with the behavioral strategy of self-leadership (r = .46, $p < .001$), the cognitive strategy of self-leadership (r = .47, $p < .001$), and working environment (r = .31, $p < .001$).

Autonomy was significantly correlated with the behavioral strategy of self-leadership (r = .19, $p < .001$), the cognitive strategy of self-leadership (r = .35, $p < .001$), and working environment (r = .31, $p < .001$).

Competency development had a significant positive correlation with the behavioral strategy of self-leadership (r = .44, $p < .001$), the cognitive strategy of self-leadership (r = .43, $p < .001$), and working environment (r = .31, $p < .001$).

Finally, social recognition was found to have a significant positive correlation with behavioral strategy as a subdomain of self-leadership (r = .26, $p < .001$), cognitive strategy as a subdomain of self-leadership (r = .31, $p < .001$), and working environment(r = .48, $p < .001$) (Table 3).

### 4. Factors affecting professionalism among participants

To identify factors influencing professionalism in health teachers, multiple regression analysis was performed for the influencing factors for each subdomain of professionalism. Regarding the assumptions of regression analysis for independent variables, the Durbin-Watson statistic was 2.09 for professional accountability, 1.80 for autonomy, 1.93 for competency development, and 2.08 for social recognition, and these values are close to 2, indicating that there was no autocorrelation. The tolerance values were 0.45~0.97, which are higher than 0.1, and the VIF values were 1.04~2.23, which are less than 10, indicating that there was no problem of multicollinearity.

First, to identify factors affecting professional accountability among the subdomains of professionalism, age, gender, length of career, school level, behavioral strategy, cognitive strategy, and working environment were entered as independent variables be-

**Table 2.** Self-leadership, Working Environment, and Professionalism (*N*=198)

| Variables | | Min. | Max. | M | SD |
|---|---|---|---|---|---|
| Professionalism | Total | 2.40 | 5.00 | 4.12 | 0.46 |
| | Professional accountability | 2.82 | 5.00 | 4.28 | 0.46 |
| | Autonomy | 1.67 | 5.00 | 4.07 | 0.66 |
| | Competency development | 1.67 | 5.00 | 4.04 | 0.68 |
| | Social recognition | 1.00 | 5.00 | 3.63 | 0.70 |
| Working environment | | 1.31 | 4.94 | 3.28 | 0.58 |
| Self-leadership | Total | 2.88 | 5.00 | 3.97 | 0.41 |
| | Behavioral strategy | 2.92 | 5.00 | 4.05 | 0.44 |
| | Cognitive strategy | 2.25 | 5.00 | 3.72 | 0.53 |

**Table 3.** Relationships Among Self-leadership, Working Environment, and Professionalism (*N*=198)

| Variables | | Self-leadership | | Working environment | Professionalism | | | |
|---|---|---|---|---|---|---|---|---|
| | | Behavioral strategy | Cognitive strategy | | Professional accountability | Autonomy | Competency development | Social recognition |
| | | r (*p*) | | | | | | |
| Self-leadership | Behavioral strategy | 1 | .53 (<.001) | .06 (.346) | .46 (<.001) | .19 (.007) | .44 (<.001) | .26 (<.001) |
| | Cognitive strategy | | 1 | .28 (<.001) | .47 (<.001) | .35 (<.001) | .43 (<.001) | .31 (<.001) |
| Working environment | | | | 1 | .31 (<.001) | .31 (<.001) | .31 (<.001) | .48 (<.001) |

cause age, gender, length of career, and school level were found to have a significant effect on professional accountability in testing for differences, and the other three variables showed a significant correlation with professional accountability in correlation analysis. The results of regression analysis showed that behavioral strategy as a subdomain of self-leadership ($\beta = .32$, $p < .001$), cognitive strategy as a subdomain of self-leadership ($\beta = .21$, $p = .003$), and working environment ($\beta = .22$, $p < .001$) had a significant effect on professional accountability, and they explained 35% of professional accountability ($F = 14.24$, $p < .001$).

In order to identify factors affecting autonomy among the subdomains of professionalism, age, behavioral strategy, cognitive strategy, and working environment, were entered as independent variables because age was found to have a significant effect on autonomy in testing for differences, and the other three variables showed a significant correlation with autonomy in correlation analysis. In the analysis of the regression model, significant influencing variables for autonomy among health teachers were identified as age ($\beta = -.17$, $p = .010$), cognitive strategy as a subdomain of self-leadership ($\beta = .30$, $p < .001$), and working environment ($\beta = .27$, $p < .001$), and these variables explained 19.2% of autonomy ($F = 12.72$, $p < .001$).

In order to identify factors influencing competency development among the subdomains of professionalism, behavioral strategy, cognitive strategy, and working environment, were entered as independent variables because the variables were shown to have a significant correlation with competency development in correlation analysis. Regression analysis revealed that behavioral strategy ($\beta = .32$, $p < .001$), cognitive strategy ($\beta = .19$, $p = .009$), and working environment ($\beta = .24$, $p < .001$) were variables significantly influencing competency development, and these variables explained 29.5% of competency development ($F = 28.51$, $p < .001$).

Lastly, in order to identify factors influencing social recognition among the subdomains of professionalism, behavioral strategy as a category of self-leadership, cognitive strategy as a category of self-leadership, and working environment were entered as independent variables into the regression model, since the two subdomains of self-leadership and working environment were derived as significant variables in testing for differences. As a result of regression analysis, significant variables affecting social recognition in health teachers were identified as behavioral strategies as a subdomain of self-leadership strategies ($\beta = .19$, $p = .007$) and working environment ($\beta = .42$, $p < .001$), and their variables explained 28.0% of social recognition ($F = 16.81$, $p < .001$) (Table 4).

## Discussion

This study aimed to investigate the relationships between self-leadership, working environment, and professionalism among health teachers.

First, in this study, the score of professionalism was 4.12 points out of 5 among health teachers, and this result indicates that participants showed a high level of professionalism through the responses 'Agree' or 'Strongly Agree'. In particular, among the subfactors of professionalism, professional accountability showed the highest mean score of 4.28 points, and social recognition had the lowest mean score of 3.63 points. In other words, study results indicate that although health teachers show strong professionalism in areas such as setting goals about overall school health services for themselves, handling their duties according to priorities, and responding to various emergency situations using their expertise as healthcare professionals, they perceive that they do not receive adequate social recognition as professionals, and that their parents and other teachers do not trust or respect them regarding their education, medical treatment, and judgements related to their work. Since it is an important factor for maintaining a job to have positive professionalism [34], there is a need for various interventions to ensure that health teachers will have pride in their job as professionals.

Second, in this study, the score for self-leadership was 3.97

**Table 4.** Factors Influencing Professionalism ($N$=198)

| Dependent variable | Variables(reference) | | B | SE | $\beta$ | t | $p$ |
|---|---|---|---|---|---|---|---|
| Professional accountability | (Constant) | | 1.59 | 0.30 | | 5.16 | < .001 |
| | Age | | 0.00 | 0.00 | .05 | 0.67 | .914 |
| | Male(female) | | -0.39 | 0.22 | -.10 | -1.77 | .078 |
| | Career | | -0.00 | 0.00 | -.00 | -0.22 | .983 |
| | Elementary school (high school) | | 0.12 | 0.07 | .13 | 1.06 | .110 |
| | Middle school (high school) | | -0.03 | 0.08 | -.03 | -0.44 | .656 |
| | Self-leadership | Behavioral strategy | 0.33 | 0.07 | .32 | 4.71 | < .001 |
| | | Cognitive strategy | 0.18 | 0.06 | .21 | 2.97 | .003 |
| | Working environment | | 0.17 | 0.04 | .22 | 3.59 | < .001 |
| | | | Adjusted $R^2$ = .35, F = 14.24, $p$ < .001 | | | | |
| Autonomy | (Constant) | | 2.02 | 0.45 | | 4.44 | < .001 |
| | Age | | -0.01 | 0.00 | -.17 | -2.61 | .010 |
| | Self-leadership | Behavioral strategy | 0.03 | 0.11 | .02 | 0.33 | .738 |
| | | Cognitive strategy | 0.37 | 0.09 | .30 | 3.78 | < .001 |
| | Working environment | | 0.31 | 0.07 | .27 | 4.04 | < .001 |
| | | | Adjusted $R^2$ = .19, F = 12.72, $p$ < .001 | | | | |
| Competency development | (Constant) | | 0.14 | 0.43 | | 0.33 | .739 |
| | Self-leadership | Behavioral strategy | 0.50 | 0.11 | .32 | 4.58 | < .001 |
| | | Cognitive strategy | 0.25 | 0.09 | .19 | 2.63 | .009 |
| | Working environment | | 0.28 | 0.07 | .24 | 3.83 | < .001 |
| | | | Adjusted $R^2$ = .29, F = 28.51, $p$ < .001 | | | | |
| Social recognition | (Constant) | | 0.09 | 0.48 | | 0.19 | .849 |
| | Age | | 0.00 | 0.00 | .08 | 1.00 | .317 |
| | Career | | 0.00 | 0.00 | .01 | 0.13 | .890 |
| | Self-leadership | Behavioral strategy | 0.30 | 0.11 | .19 | 2.72 | .007 |
| | | Cognitive strategy | 0.08 | 0.09 | .06 | 0.87 | .385 |
| | Working environment | | 0.51 | 0.07 | .42 | 6.64 | < .001 |
| | | | Adjusted $R^2$ = .28, F = 16.81, $p$ < .001 | | | | |

points out of 5. This is a similar level to the results of a previous study in Korea [35], which reported that the level of self-leadership among health teachers was 3.82 points out of 5. A study of self-leadership in middle-school teachers using the same scale [27] reported that the score of self-leadership in middle-school teachers was 3.78 points out of 5. Meanwhile, a study of long-term care hospital nurses [36] reported that the level of self-leadership in nurses was 3.66 points out of 5. These two prior studies revealed relatively lower levels of self- leadership in middle school teachers and long-term care hospital nurses, compared to the results about health teachers of this study. Compared to the self-leadership levels of general teachers and nurses, health teachers' higher level of self-leadership is thought to reflect the characteristics of the work of health teachers who are in charge of school health duties and various school health programs, take overall responsibility for them, and need to set goals on their own and lead related activities when they perform their duties [35]. Among the subfactors of self-leadership, 'self-goal-setting', which is one of behavioral strategies, showed the highest score of 4.34 points, and 'natural reward', which is one of cognitive strategies, had the lowest score of 3.46 points. These results are similar to the results of a study of middle school teachers [27], which showed that the score for self-goal-setting was highest, and the score for natural reward was lowest. In other words, research results suggest that health teachers perceive a series of processes of setting and prioritizing goals in their work as very important, and thus carry out the processes, but they lack confidence in their ability to achieve high performance and think that they may not overcome obstacles when they encounter them. In this regard, a previous study [8] reported that a significant influencing factor

for health teachers' organizational commitment to the school is teacher efficacy, which refers to teachers' belief and confidence in their own ability to perform their job. This finding supports the results of this study that health teachers are required to have self-leadership for cultivating confidence in job competency as well as job competency as professional teachers in order to successfully perform duties required of health teachers. Therefore, it is first necessary to identify specific obstacles that arise in the process of operating health services and school health programs that health teachers carry out independently. Then, as the next step, there is a need to develop and operate self-leadership enhancement programs to enable health teachers to overcome the obstacles and create a democratic and open communication system. In addition, assistance and administrative support from school members including the principal are required for health teachers to improve their confidence as they continuously have success experiences at work.

Third, in this study, the score of working environment was 3.28 points out of 5, which is a score above the midpoint. In a previous study, Park [37] assessed the working environment of kindergarten teachers using a different assessment tool, and reported the score as 3.52 points out of 5, which is higher than the score of health teachers in this study. Meanwhile, a study of nurses [38] reported that the score for working environment of nurses was 2.43 points out of 4, which is relatively lower, compared to the score of health teachers in this study. Since different occupational groups have different working environments, it is difficult to make a direct comparison between different occupational groups, but the research findings described above suggest that health teachers working in schools have a better working environment than hospital nurses. However, since health teachers perform professional duties as the only healthcare professional in each school, it is difficult for health teachers to receive help or support from fellow teachers [20]. In addition, it has been reported that health teachers feel a sense of psychological pressure and a heavy burden of responsibility regarding handling all duties related to school health services by themselves. These factors are thought to explain the fact that health teachers showed a lower level of working environment than other teachers [39]. A prior study also showed that a good working environment is associated with high-quality nursing and high job satisfaction, and professional working environment is directly related to nurturing competence nurses, but a poor working environment acts as an obstacle to the performance of high-quality, professional, and excellent nursing [38]. Likewise, a poor working environment may negatively affect not only health teachers' job performance but also students' health problems. Therefore, it is very important to establish a basis for securing excellent and professional nursing workforce by assessing and improving the working environment of health teachers [38]. The specific aspects of working environment about which health teachers have negative perceptions include a lack of clarity in the scope and content of their job duties, student health services that heath teachers need to perform independently, the burden about their roles in health counseling and handling civil complaints, and their difficulty in going out, leaving work early, and taking sick leave or annual leave as well as going on a business trip because most of them work alone. Therefore, it is necessary to develop a manual that can improve the principal's and other managers' awareness of the roles of health teachers and ensure clarity in the division of work regarding the duties of health teachers. In addition, there is a need to develop and implement specific policies, such as guidelines for emergency situations in the absence of health teachers, the support of professional personnel such as nurses, and a flexible school health operation system, instead of temporarily replacing health teachers with not healthcare professionals but general teachers.

Fourth, there were positive correlations between self-leadership, working environment and professionalism. These results are supported by a previous study that showed a positive correlation between self-leadership and professionalism among nursing students [41]. Another prior study also showed a significant positive correlation between nursing working environment and nursing professionalism among long-term care hospital nurses [34]. As nurses with a high level of self-leadership were found to exert excellent abilities in communication, interpersonal relationships, and nursing services [41], the enhancement of self-leadership is thought to serve as the foundation of the development of the nursing profession [42].

Lastly, the analysis of factors influencing professionalism in health teachers showed that working environment had an effect on professional accountability, autonomy, and competency development among the subfactors of professionalism. These results suggest that the evaluation and improvement of working environment are very important factors in the enhancement of the professionalism of health teachers. Accordingly, there is a need to develop a manual to ensure the development of guidelines on emergency situations in the absence of health teachers, expansion of the support of professional workforce, a flexible school health operation system, the improvement of administrators' awareness of the roles of health teachers, and the clarification of the division of duties. In addition, the results of this study showed that cognitive strategies as subfactors of self-leadership

strategies influenced professional accountability, autonomy, and competency development among the subfactors of professionalism, and behavioral strategies as subfactors of self- leadership strategies had an effect on professional accountability, autonomy, and social recognition among the subfactors of professionalism. In this study, cognitive strategies were not related to social recognition, and behavioral strategies did not show a significant relationship with autonomy among heath teachers. Regarding the working environment of health teachers, although they perform highly professional duties as healthcare professionals, it is often the case that they are not given recognition and reward when they exert their competency and resolve problems autonomously in the performance of their duties, and they experience a heavy burden of responsibility and psychological pressure regarding the results by themselves [39], so health teachers generally tend to perform their duties according to a given manual. These problems are thought to be related to the fact that the participants in this study mostly did not use cognitive strategies such as confidence about achieving high performance and overcoming obstacles, and many of them actually showed a low level of autonomy in the performance of job duties.

Since health teachers showed a high level of professional accountability and a low level of social recognition in this study, it is important to strengthen behavioral strategies among self-leadership strategies. Therefore, regarding the development of self-leadership enhancement programs for health teachers, to complement the 'self-criticism' factor that showed the lowest score among behavioral strategies comprising a subdomain of self-leadership strategies, it is necessary to strengthen self-leadership that is needed to objectively analyze oneself and achieve one's growth through proper self-criticism about successes and failures in performing one's duties. Above all, it is necessary to develop and implement policies for providing support and help to health teachers to ensure that health teachers themselves will recognize the importance of their duties, have self-esteem regarding their work, and gain a sense of accomplishment and satisfaction from their work. In addition, it is necessary to carry out various activities for forming a trust relationship between health teachers and school members including the principal, fellow teachers, and students' parents, and promoting cooperation among them.

In conclusion, the results of this study showed that self-leadership and working environment are closely related to professionalism among health teachers. The results of this study can be used as basic data for making suggestions on policies to recognize the importance of the enhancement of self-leadership for the establishment of the proper professionalism of health teachers and create a desirable working environment for health teachers. The study findings can also serve as a basis for the development and application of a professionalism enhancement program for health teachers. However, since participants were selected by a random sampling method through an online survey in data collection, caution is needed in the generalization of research findings. In addition, the present study used an assessment tool for professionalism for health teachers originally developed as a 4-point scale [4] after modifying it into a 5-point scale, but this research did not consider differences in assessment results or bias that could arise due to the modification of the scale.

## Conclusions

This study attempted to investigate relationships between self-leadership, working environment, and professionalism among health teachers. Regarding the significance of the present study, this research was conducted in a situation where there were few previous studies on professionalism of health teachers. In addition, this study conducted a detailed analysis of the professionalism of health teachers, and presented realistic methods and policy directions regarding factors that can contribute to the improvement of the professionalism of health teachers. In this study, behavioral strategies and cognitive strategies among self-leadership strategies and working environment were found to significantly influence professionalism. Based on the results of this study, the following suggestions are presented.

First, the results of this study showed that a higher level of self-leadership and a better working environment were associated with a higher level of professionalism. Therefore, to improve the professionalism of health teachers, it is necessary to establish a democratic and open communication system, identify specific obstacles that health teachers encounter in performing their duties independently, and develop and operate self-leadership enhancement programs to enhance health teachers' capability to overcome impediments to their work and promote their appropriate self-criticism. In addition, the assistance and administrative support of school members including the principal and managers to help health teachers to perceive the importance of their duties and work with self-esteem and self-confidence as the only healthcare professional in each school.

Second, especially the working environment of health teachers was found to be a factor influencing all the subfactors of professionalism. Therefore, it is necessary to develop policies for a desirable working environment, including creation of a manual for clarification of the division of work of health teachers, establish-

ment of guidelines for emergency situations in the absence of health teachers, support of professional healthcare personnel, and a flexible school health operation system in addition to enhancement of the awareness of health teachers' roles among people in charge of the management and operation of the school.

Third, influencing factors for the professionalism of teachers were identified as self-leadership and working environment. However, it is difficult to exclude the possibility of other external factors required for the establishment of the professionalism of health teachers, so further research including replication studies is required to identify various factors related to the cultivation of professionalism.

Lastly, although a number of research on professionalism among nurses has been conducted, there has not been sufficient domestic research on the professionalism of school health teachers who meet qualification requirements of nurses and are in charge of school health-related duties. Therefore, further research, including replication studies, should be conducted in the future.

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## Authors' contributions

Kim, Joohee contributed to conceptualization, data curation, formal analysis, funding acquisition, methodology, project administration, visualization, writing-original draft, investigation, resources, software, supervision, and validation. Ko, Young contributed to conceptualization, data curation, formal analysis, methodology, project administration, writing -review & editing, investigation, resources, software, supervision, and validation.

## Data availability

Please contact the corresponding author for data availability.

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