

ISRG JOURNAL OF CLINICAL MEDICINE AND MEDICAL RESEARCH [ISRGJCMR]



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ISRG PUBLISHERS

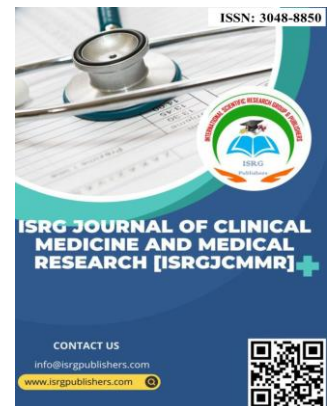
Abbreviated Key Title: ISRG J Clinic.Medici.Medica.Res.

ISSN: 3048-8850 (Online)

Journal homepage: <https://isrgpublishers.com/cmmr/>

Volume – III, Issue - III (May-June) 2026

Frequency: Bimonthly



Nurse Image Perceived by High School Students: Q Methodological Approach

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| **Received:** 07.05.2026 | **Accepted:** 14.05.2026 | **Published:** 17.05.2026

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Abstract

Purpose This study aimed to identify and classify the subjective perceptions of nurse images recognized by high school students using Q methodology and to explore the perceptual characteristics of each type. Through this process, the study sought to understand how high school students perceive nurses and to provide foundational data for establishing positive nurse images and developing effective nursing career guidance programs.

Methods To construct the Q population, written interviews were conducted with 45 high school students from August to December 2025 regarding their perceptions, impressions, and thoughts about nurses. In addition, domestic and international literature related to nurse image and nursing perception was reviewed to supplement the statements. After removing duplicate expressions and reviewing semantic clarity and content validity, a total of 34 Q sample statements were finalized. Participants sorted the 34 Q statements into a forced quasi-normal distribution using a 9-point scale. The sorted data were scored and analyzed using the PC-QUANL program through factor analysis.

Results As a result of the analysis, the nurse image recognized by high school students was classified into two types. The first type was the 'real awareness type nurse image' that recognizes the high work intensity and realistic working environment of nurses, and the second type was the 'Nightingale type nurse image' that recognizes nurses centering on sacrifice and service spirit.

Conclusion This study categorized high school students' perceptions of nurse images based on subjective viewpoints and provided a framework for understanding the diverse ways adolescents perceive the nursing profession. The findings may serve as foundational data for developing tailored nursing career education and promotional strategies, and ultimately contribute to fostering positive nurse images and encouraging interest in the nursing profession among high school students.

Keywords: Nursing student, career behavior experience, Q methodology

Introduction

Recent changes in the healthcare environment have expanded the role of nurses beyond simple patient care to include professional decision-making, health education, and the utilization of digital healthcare technologies (Hants et al., 2023; Longhini et al., 2024). However, the public image of nurses, often shaped through mass media and sociocultural experiences, frequently remains limited to traditional perceptions. Such perceptions may influence adolescents' attitudes toward nursing and their career choices (Sagaca et al., 2024; Tuohino et al., 2017). In particular, high school students are at a critical stage in developing career identity and occupational values, and their perceptions of nurses are closely associated with future decisions regarding nursing school admission and professional career selection (Moon & Lee, 2016; Kye & Lee, 2024).

Despite the importance of this issue, previous studies have primarily focused on nursing students or adults, and there is a lack of research exploring the subjective characteristics and perception types of nurse images among high school students (Park & Park, 2014; Kim & Kang, 2013). Furthermore, perceptions of nurses may vary according to individual experiences and values; therefore, quantitative approaches alone are insufficient to fully explain the structural characteristics of such perceptions.

Accordingly, this study aimed to classify the types of nurse images perceived by high school students and to analyze the characteristics of each type using Q methodology. Through this approach, the study seeks to provide a multidimensional understanding of adolescents' perceptions of the nursing profession and to offer foundational data for developing nursing career experience programs, nursing promotion strategies, and educational interventions to foster positive nurse images.

Method

1. Research design

This study is an exploratory study that applied Q methodology to systematically explore the subjective perception of the nurse image recognized by high school students. According to the basic procedure of the Q methodology, a Q population was constructed by widely collecting various statements related to the nurse image, and then a Q sample was selected in consideration of the representativeness and clarity of the content. After that, high school students were recruited as a P sample and Q classification was conducted, and the classified data were subjected to a scoring process to derive factors for each type. This series of procedures was carried out step by step in order to scientifically and systematically identify the subjective perception structure inherent in the nurse image recognized by high school students.

2. Sampling method

1) Q-population and Q-sample

In this study, as the primary data collection stage for the composition of the Q statement, written interviews were conducted with 16 high school students located in I-si, Korea. The interview was organized around the image of a nurse recognized by high school students and the thoughts of the nursing job, and included open-ended questions such as "What image do you have about a nurse," "What are the roles or characteristics that come to mind when you think of a nurse," and "What are the reasons or experiences that the image of a nurse was formed?" Through this, various perceptions and meanings of the role, professionalism,

social image, and professional value of nurses recognized by high school students were specifically described. In the written response process, the researcher provided additional explanations if necessary so that the participants could fully understand the purpose of the question to ensure the fidelity and accuracy of the response. In addition, in order to collect statements related to the image of nurses, professional awareness, and youth career awareness, domestic and foreign prior studies and professional books related to the image of nurses were repeatedly reviewed. By integrating and refining the data collected through these procedures, 180 Q population statements were finally derived.

The Q population statements collected for the composition of the Q sample were repeatedly reviewed and classified by subject according to the content characteristics of the nurse image. After that, with the advice of one nursing professor with Q methodology research experience, the overall check and correction were conducted focusing on whether the meaning was duplicated between statements, the suitability of the content, the ease of understanding of sentences, and the clarity of expression. In this process, the researcher reconstructed the meaning of the statement by considering the socio-cultural context of the nurse image currently recognized by adolescents based on nursing education and clinical field experience, and statements with similar meanings were integrated and refined and categorized. Through this procedure, the Q population was systematically structured, and finally, 34 statements that could represent the image of nurses recognized by high school students were confirmed as Q samples.

2) P-sample

In the Q methodology, the P sample is set based on a small-sample theory, and if the number of participants is too large, the response is concentrated on a specific factor, which may lead to limitations in clearly distinguishing the characteristics between factors. Therefore, the P sample follows the view that a limited number within the range of factor derivation and comparison and interpretation of the characteristics of each type is sufficient (Kim, 2008). In this study, data were collected for high school students located in I-si, Korea according to these theoretical criteria. A total of 16 high school students who agreed to participate in the study and faithfully performed Q classification were selected as P samples.

3) Q-sorting and statistical analysis

For the Q sample classification, a total of 34 statements were arranged in the form of forced distribution based on the nurse image recognized by the study participants according to the procedure of the Q methodology. Prior to starting the classification, the researcher briefly explained the purpose and progress of the study to the participants, and provided Q classification data in which each statement was presented in the form of an individual card. Participants first classified the presented statements into three categories: 'agree', 'neutral', and 'disagree', and then rearranged the statements in each category according to their relative importance according to their perception. In this process, the most positively recognized statement was placed on the right side of the distribution map, the most negative recognized statement was placed on the left side, and the neutral statement was placed in the center. The result of the statement classification was converted into a 9-point scale from the most negative perception to the most positive perception and scored on a 9-point scale, and 1 point was assigned to the statement located at

the left extreme of the distribution map, and 9 points were assigned to the statement located at the right extreme. The scored data were analyzed using PC-QUANL, a Q methodology analysis program. As a result, two types were finally selected that the characteristics of the nurse image recognized by high school students were most clearly distinguished and had high interpretability.

Result and Discussion

1. Formation of Q type

As a result of analyzing the Q classification data of the study participants for 34 statements using the PC-QUANL program, high school students' perception of nurse image was derived into a total of two types (Table 1).

2. Characteristics by Type

As a result of the analysis based on the Q classification results of the study participants, the nurse image recognized by high school students was classified into a total of two types, and the number of participants included in each type was 10 of type 1 and 6 of type 2. The demographic characteristics and factor loading of participants by type are presented in Table 2. Among them, participants with a relatively high factor weight were interpreted as examples that best represent the recognition characteristics of this type (Kim, 2008). As a result of repeated analysis by setting the number of factors step by step to determine the final number of types, two factors were adopted as the nurse image recognition type of final high school students.

1) Type I : Reality-aware nurse image

It was found that 10 out of a total of 16 subjects belonged to Type I. The statements in which Type I showed the strongest consent compared to Type II were 'Q30. There is a unique burning culture of nurses' and 'Q31. Nurses seem to have a clear hierarchical culture.' On the other hand, the items with strong negative consent compared to Type II were 'Q22. A nurse is a white angel' and 'Q26. A nurse is a noble progression that comments from motherhood'.

Taken together, the subjects belonging to Type I tended to recognize realistic aspects such as work intensity, responsibility, and stress of the actual clinical field rather than ideal or fragmentary images of nurses. They recognized nurses as professionals, but at the same time understood them as occupations involving high work burden and emotional labor, and their awareness of the practical difficulties of nursing jobs was clearly shown. Therefore, Type 1 was named "real awareness nurse image" by reflecting the characteristics of recognizing the actual working environment and occupational reality of nurses.

2) Type II : Nightingale type nurse image

Type II was 6 out of 16 people. The items with strong consent compared to Type 1 were 'Q19. It is retractable that of the nursing law of the raising the status of the nurses has failed', and 'Q20. A nurse is so a helpful job for the family'. On the other hand, the items with strong negative consent compared to Type II were 'Q10. A nurse is a medical job for people' and 'Q14. There is still a perception that nurses are struggling in the 3D industry'. Taken together, the subjects belonging to Type II tended to perceive nurses as beings practicing sacrifice and service spirit, not just professionals. They viewed the patient as an important characteristic of a nurse to take care of the patient with dedication,

warm empathy, and responsibly stand by the patient even in difficult situations. In addition, they highly value the value of humanity and consideration required of nurses and showed characteristics that emphasize the ideal nurse image based on the traditional Nightingale spirit. Therefore, Type II was named "Nightingale-type nurse image" reflecting the image of a nurse centered on service and dedication.

3) Common view between types

As we have seen so far, the two types of nurse image recognition types of high school students have their own characteristics for each type. In addition, common views between types are presented in Table 5.

Conclusion

This study was conducted to explore the subjective perception structure of the nurse image recognized by high school students by applying the Q methodology and to understand the characteristics of each type in depth by categorizing it. As a result of the study, the nurse image recognized by high school students was derived into two types: 'real awareness type nurse image' and 'nightingale type nurse image'. This study has academic significance in that it systematically classifies the perception of the nurse image from the perspective of adolescents and structures its meaning. However, there is a limit to generalizing the research results as the research participants are limited to 16 high school students in a specific region.

The results of this study can be used as basic data for the development of customized nursing job career education and promotion programs in consideration of the type of nurse image of high school students. According to the characteristics and perception patterns of each type, it is expected to contribute to the establishment of differentiated education and promotion strategies including promoting understanding of nursing professions, forming a positive nurse image, and supporting nursing job career exploration. In addition, it is judged that continuous and systematic operation of nursing career experience programs at the school and community level is necessary because the image of nurses formed during adolescence can affect future career choices.

Based on the results of this study, I would like to make the following suggestions.

First, it is necessary to develop a customized career education program for nursing jobs that reflects the characteristics of adolescents and the level of career development according to the type of nurse image recognized by high school students.

Second, it is necessary to prepare a systematic promotion and educational strategy in connection with school career education and nursing department career experience programs in consideration of the characteristics of nurse images by type.

Third, it is necessary to generalize research results through follow-up studies, including high school students in various regions and schools, and to explore in-depth social and cultural factors that affect the formation of nurse images.

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<Table 1> Eigen values and percentages of variance by type

| | Type I | Type 2 |
|-------------------|--------|--------|
| Eigen value | 8.04 | 3.93 |
| Variance(%) | .17 | .08 |
| Accumulated value | .41 | .62 |

<Table 2> Demographic characteristics and factors by type are weighted (N=16)

| Type | No. | grade | weight factor | age | gender | residential area | school type | desired major | Nursing Awareness | nurse around | idea of nursing |
|-------------------|-----|-------|---------------|-----|--------|------------------|-------------|---------------|-------------------|--------------|-----------------|
| Type I (n=10) | 1 | 2 | 1.53 | 18 | female | I city | general | nursing | Positive | No | very positive |
| | 2 | 2 | .44 | 18 | female | I city | general | nursing | very positive | No | Positive |
| | 4 | 2 | 1.09 | 17 | male | I city | general | undetermined | Positive | No | average |
| | 8 | 1 | 1.73 | 17 | female | I city | general | nursing | Positive | Yes | average |
| | 9 | 1 | .49 | 17 | female | I city | Specialized | undetermined | Positive | No | average |
| | 10 | 1 | .50 | 17 | female | I city | Specialized | undetermined | Positive | No | average |
| | 11 | 2 | .92 | 18 | female | I city | general | nursing | very positive | Yes | Positive |
| | 12 | 2 | .64 | 18 | male | I city | Specialized | undetermined | Positive | No | average |
| | 13 | 2 | .38 | 18 | female | I city | Specialized | undetermined | Positive | No | average |
| Type II (n= 6) | 3 | 2 | 1.67 | 18 | male | I city | general | nursing | very positive | Yes | Positive |
| | 5 | 2 | 2.24 | 18 | female | I city | Specialized | nursing | very positive | Yes | Positive |
| | 6 | 1 | .65 | 17 | male | I city | general | nursing | Positive | No | Positive |

| | | | | | | | | | | | |
|--|----|---|------|----|--------|--------|---------|---------|---------------|-----|---------------|
| | 7 | 1 | .18 | 18 | female | I city | general | nursing | Positive | Yes | very positive |
| | 14 | 2 | .36 | 18 | male | I city | general | nursing | very positive | No | very positive |
| | 15 | 2 | 1.01 | 17 | male | I city | general | nursing | very positive | No | Positive |

<Table 3> Q statement and Z score by type (N=16)

| Q statement | | Z score | |
|-------------|--|------------------|------------------|
| | | Type I (n=10) | Type II (n=6) |
| Q1 | Nurses are one of the representative three-shift jobs. | .78 | -.32 |
| Q2 | Nurses seem to be a stressful job. | 1.33 | -.72 |
| Q3 | A nurse is a person who nurses around the patient 24 hours a day. | -1.15 | .28 |
| Q4 | Compared to developed countries, nurses often have ambiguous work boundaries. | -.84 | -.98 |
| Q5 | A nurse is a person who takes care of a sick person until he or she recovers. | -.17 | .88 |
| Q6 | A nurse is not a job that can last a long time. | -1.85 | -1.58 |
| Q7 | It has a systematic curriculum to become a nurse. | .41 | .40 |
| Q8 | A nurse is one of the legal medical professionals. | 1.21 | .60 |
| Q9 | Nurses have the characteristics of communicating with patients. | 1.10 | .69 |
| Q10 | A nurse is a necessary job for people. | 1.21 | 1.41 |
| Q11 | Nurses seem to be proud of doing something worthwhile. | .05 | 1.51 |
| Q12 | A nurse is a job that serves others. | -.10 | .93 |
| Q13 | Nurses contribute to the health promotion and recovery of the people. | .68 | .76 |
| Q14 | There is still a perception that nurses are struggling in the 3D industry. | .55 | -.68 |
| Q15 | It is unfortunate that nurses are socially limited to the role of doctor assistance. | -.67 | -.46 |
| Q16 | It seems that people tend to ignore nurses. | -.92 | -.44 |
| Q17 | Nurses are preferred jobs with the recognition that they are professionals with guaranteed employment. | 1.07 | .23 |
| Q18 | I felt respect for the way I was committed in the COVID-19 situation. | -.04 | 1.68 |
| Q19 | It is regrettable that the enactment of the nursing law to raise the status of nurses has failed. | -.45 | -.58 |
| Q20 | A nurse is also a helpful job for the family. | .59 | .80 |
| Q21 | It is regrettable that the legal treatment of nurses is poor compared to advanced countries abroad. | -.56 | -1.40 |
| Q22 | A nurse is a white angel. | -1.21 | 1.16 |
| Q23 | Nurses don't have a high salary level compared to what they do. | -.46 | -.79 |
| Q24 | Nurses are directly related to the patient's life, so they seem to have to work carefully in everything. | 1.49 | 1.29 |
| Q25 | I have to study a lot to be a nurse. | 1.57 | .16 |
| Q26 | A nurse is a noble profession that comes from motherhood. | -.95 | 1.25 |

| | | | |
|-----|---|-------|-------|
| Q27 | A nurse is a difficult job that requires struggling because the job itself is difficult. | .72 | -.10 |
| Q28 | It is unfortunate that nurses perceive them as only people who give injections. | -.67 | -.33 |
| Q29 | Nurses are active in political activities. | -2.05 | -1.17 |
| Q30 | There is a unique burning culture of nurses. | 1.38 | -1.89 |
| Q31 | Nurses seem to have a clear hierarchical culture. | .43 | -1.62 |
| Q32 | Nurses always have disagreements with assistants. | -1.42 | -1.18 |
| Q33 | The performance of the Korea Nursing Association, a professional organization representing nurses, is impressive. | -1.10 | -.73 |
| Q34 | When I think of the image of a nurse, I think of Nightingale. | .02 | .94 |

<Table 4> Strong positive statements and strong negative statements for each type (N=26)

| Type | Q statment | Z score | Average Z Score | Difference | |
|------|------------|--|-----------------|------------|-------|
| I | Q30 | There is a unique burning culture of nurses. | 1.37 | -1.88 | 3.26 |
| | Q31 | Nurses seem to have a clear hierarchical culture. | .43 | -1.61 | 2.05 |
| | Q2 | Nurses seem to be a stressful job. | 1.33 | -.71 | 2.04 |
| | Q25 | I have to study a lot to be a nurse. | 1.56 | .16 | 1.40 |
| | Q14 | There is still a perception that nurses are struggling in the 3D industry. | .55 | -.68 | 1.23 |
| | Q1 | Nurses are one of the representative three-shift jobs. | .78 | -.31 | 1.09 |
| | Q12 | A nurse is a job that serves others. | -.09 | .93 | -1.02 |
| | Q5 | A nurse is a person who takes care of a sick person until he or she recovers. | -.16 | .88 | -1.05 |
| | Q3 | A nurse is a person who nurses around the patient 24 hours a day. | -1.14 | .27 | -1.42 |
| | Q11 | Nurses seem to be proud of doing something worthwhile. | .05 | 1.51 | -1.46 |
| | Q18 | I felt respect for the way I was committed in the COVID-19 situation. | -.04 | 1.68 | -1.72 |
| | Q26 | A nurse is a noble profession that comes from motherhood. | -.94 | 1.24 | -2.19 |
| | Q22 | A nurse is a white angel. | -1.21 | 1.15 | -2.36 |
| II | Q19 | It is regrettable that the enactment of the nursing law to raise the status of nurses has failed. | .68 | -.80 | 1.48 |
| | Q20 | A nurse is also a helpful job for the family. | .88 | -.57 | 1.45 |
| | Q24 | Nurses are directly related to the patient's life, so they seem to have to work carefully in everything. | .56 | -.68 | 1.24 |
| | Q8 | A nurse is one of the legal medical professionals. | .41 | -.81 | 1.22 |
| | Q4 | Compared to developed countries, nurses often have ambiguous work boundaries. | 1.38 | .17 | 1.20 |
| | Q34 | When I think of the image of a nurse, I think of Nightingale. | -.50 | .58 | -1.08 |
| | Q16 | It seems that people tend to ignore nurses. | -.42 | .74 | -1.16 |
| | Q32 | Nurses always have disagreements with assistants. | -.64 | .56 | -1.20 |

| | | | | |
|-----|---|-------|------|-------|
| Q28 | It is unfortunate that nurses perceive them as only people who give injections. | -.07 | 1.23 | -1.31 |
| Q33 | The performance of the Korea Nursing Association, a professional organization representing nurses, is impressive. | -.22 | 1.13 | -1.35 |
| Q29 | Nurses are active in political activities. | -.42 | 1.10 | -1.52 |
| Q14 | There is still a perception that nurses are struggling in the 3D industry. | -2.04 | -.41 | -1.62 |
| Q10 | A nurse is a necessary job for people. | -1.60 | .88 | -2.48 |