

Original research

Behavioral traits of the nursing students with special educational needs in Japan[☆]Yuko Ikematsu^{a, *}, Koji Egawa^b, Midori Endo^c, Mitsuko Yokouchi^d^a Department of Nursing, Nagoya University Graduate School of Medicine, Japan^b Kobe City College of Nursing, Japan^c School of Nursing, Yamanashi Prefectural University, Japan^d Department of Nursing, Faculty of Nursing, Kobe Women's University, Japan

ARTICLE INFO

Article history:

Received 2 June 2015

Received in revised form

7 September 2016

Accepted 30 September 2016

Keywords:

Nursing students

Special educational needs

Developmental disorders

Behaviors

Japan

ABSTRACT

Nursing students with tendencies toward developmental disorders or special educational needs could face difficulties while studying nursing. The study examined the behavioral traits of nursing students with special educational needs who graduated in Japan in March 2011. Nurse educators from 341 programs provided information concerning students who had been identified as difficult to teach while enrolled in nursing programs. Behavioral traits were examined in students with special educational needs ($n = 139$) and those who did not have special needs but were identified as difficult to teach by the nurse educators ($n = 84$). The most prevalent behaviors in students with special needs were “making excessive excuses” in unstressful situations and “lapsing into silence” under stressful circumstances. The number of students with special needs who were prone to “blaming others” and “disappearing” was higher relative to that of students without special needs under unstressful circumstances. Under stressful circumstances, “blaming others,” “disappearing,” and “staying at home” were reported more frequently for students with special needs than they were for students without special needs. Nurse educators should pay attention to these behaviors in students facing difficulties while studying nursing.

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1. Introduction

1.1. Background

Developmental disorders, such as learning disabilities (LDs), attention deficit hyperactivity disorder (ADHD), and high-functioning autistic-spectrum disorder (HASD), or Asperger's syndrome, were initially considered childhood problems. However, recent studies have revealed that these conditions persist into adulthood (Sadock and Sadock, 2009). Nursing students with developmental disorders have also been identified (Bradshaw and Salzer, 2003; Ijiri and Kudzma, 2000). It is reasonable to assume

that these students face extreme difficulty in clinical practice in which multiple tasks and unexpected changes are inevitable. However, there are few research studies about nursing students with developmental disorders. The reason of the paucity may be due to inconsistent definitions of those disorders. For example, the term “developmental disorders” is used in medicine and related fields, whereas “developmental disabilities” is used predominantly in education and welfare fields.

The use of confusing terminology is most apparent for LDs and dyslexia. For example, “LD” is used to abbreviate a variety of terms including “learning disability” (Ijiri and Kudzma, 2000), “learning disorder” (Desoete and De Weerd, 2013; Margari et al., 2013), and “learning difficulty” (Carman and Chapparo, 2012). In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, “specific learning disorder” is listed as a subcategory of neurodevelopmental disorders (American Psychiatric Association, 2013) and describes impairment in reading, written expression, and mathematics. The term “dyslexia” is cited as an alternative term for reading impairment in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. In contrast, the British Dyslexia Association defines dyslexia as “a learning difficulty that

[☆] The content of this manuscript except which published on “Nurse Education in Practice, Vol. 14, pp. 674–679” has not been published elsewhere and is not currently under consideration for other journals.

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primarily affects the skills involved in accurate and fluent word reading and spelling” (British Dyslexia Association, 2016; para. 4). These discrepancies between definitions hinder scientific progress in this field considerably.

To assist nursing students with developmental disorders in adjusting to nursing studies, it is important to assess their predisposition to developmental disorders, because they have special needs related to their disorders. However, typical manifestation of the condition is often masked in college students, because they have coped with related difficulties since they were young. Therefore, understanding their coping behaviors could help nurse educators to recognize their disorders and initiate appropriate supportive measures. We conducted a national survey that included nursing students with special educational needs in Japan (Ikematsu, 2014). As the survey did not employ a definitive diagnosis for developmental disorder, the term “special educational needs” was used; “special educational needs” and “possible developmental disorder” are used interchangeably in this article.

1.2. Literature review

The term “developmental disorder” is a collective term to describe several types of disorder. Dyslexia is one form of LD in some countries such as United States and Japan. People with dyslexia have difficulty reading, writing, calculating, listening, talking, and reasoning, despite normal intellectual development.

The difficulties experienced by nursing students with dyslexia have been examined (Child and Langford, 2011). Nursing students experience difficulties that are common to general college students in addition to problems related to nursing studies. The difficulties that could be experienced by non-nursing students were “the need for more time to complete tasks,” “short-time memory difficulty,” “spelling difficulty,” “writing difficulty,” “reading difficulty,” and “pronunciation difficulty.” In addition to these common difficulties, nursing students face difficulties unique to clinical practice, such as a lack of understanding regarding dyslexia, a need for more information about dyslexia for clinical mentors and staff discrimination and judgmental attitudes upon disclosure of their dyslexia. Nursing students with dyslexia have special needs to be considered by nurse educators. It is important to determine those needs prior to their clinical practicum.

ADHD is characterized by “a pattern of diminished sustained attention and higher levels of impulsivity” (Sadock and Sadock, 2009, p. 79). Although ADHD is considered a childhood impairment, it persists into adulthood for some students in higher education. Although no research studies that included nursing students with ADHD were identified in our literature review, anecdotal evidence of a case of nursing student with ADHD is reported and discussed in the literature (Bradshaw, 2006; Bradshaw and Salzer, 2003). Bradshaw and Salzer (2003) provided an overview of ADHD, which included a single case in which a nursing student with ADHD behaved in an inappropriate manner in clinical settings. Although other traits, such as sloppiness and lack of organization in writing assignments, interrupting other students during speech, and poor time management, are common problems for students with ADHD in other disciplines, inability to behave appropriately during clinical practica could be a significant drawback for those studying nursing.

HASD, also known as Asperger’s syndrome, is another developmental disorder. HASD is characterized by disturbances in communication and socialization and a tendency to focus on specific interests (Graetz and Spampinato, 2008). Our literature search did not reveal any studies that included nursing students with HASD. Impairment of communication and socialization could affect clinical practica in nursing curricula, and limited interest could

exert an impact on learning a wide range of human responses to health problems.

The Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in Japan conducted a national survey of elementary and junior high school students (aged 6–15 years) in 2012, to identify those with special educational needs. A sample including 53,882 students in mainstream classes (i.e., not in special support classes) was evaluated by schoolteachers using a questionnaire that developed for a related survey conducted in 2002. The 2012 survey revealed that 6.5% of students had special learning and/or behavioral needs that were relevant to developmental disorders. This result indicated that students with a tendency toward developmental disorders remain undiagnosed and are included in mainstream classes. It is possible that these students are able to enroll in nursing programs because they are not intellectually impaired. Traits of those with developmental disorders, such as difficulty in communication, inattentiveness, and lack of empathy, affect their nursing studies severely. Early detection and individual approaches are crucial to their success in nursing programs.

It is known that adults with developmental disorders often exhibit comorbid behavioral and psychological problems. In a study that included a sample of students from a single university, tendencies toward HASD, measured via the Autism Spectrum Quotient and Social Responsiveness Scale-Brief Format Adult Self-Report Form, were positively associated with social anxiety, depression, and aggression (White et al., 2011). Nursing students with developmental disorders might not manifest typical symptoms of their disorders, because they could have acquired skills to compensate for related weaknesses at an early age. Instead, behavioral and psychological traits are often obvious and could affect their everyday lives.

Developmental disorders are currently considered to occur on a spectrum. Exhibition of a tendency toward developmental disorders without meeting diagnostic criteria is known as a “broader phenotype” or “subclinical manifestation” (Ingersoll, 2010). People with such tendencies without a definite diagnosis of developmental disorders have received considerable attention (Baron-Cohen et al., 2001; Ingersoll, 2010; White et al., 2011). Evidence suggests that a tendency toward HASD (broader autism phenotype) is associated with lower nonverbal sensitivity (Ingersoll, 2010). Nurses are expected to be sensitive to nonverbal cues, because they provide care for frail patients including those who are cognitively impaired and unable to verbalize their pain or needs. Therefore, it is important to identify nursing students with this tendency, even if they do not fulfill the diagnostic criteria indicating a need for provision of special educational support.

This article reports details of the behaviors of students with special educational needs, which were collected as a part of the survey. The purpose of this study was to clarify the behavioral traits of nursing students with special needs, to help nurse educators detect predisposition before students experience difficulties in clinical practice. The specific aims of the study were to determine the following:

1. How nursing students with special educational needs behave under unstressful and stressful circumstances
2. Differences in behavior between nursing students with and without special educational needs under unstressful and stressful circumstances

2. Research design

The study used a cross-sectional survey design. Directors of nursing programs for registered nurses (RNs), excluding high-school-affiliated five-year diploma and tele-education programs,

in Japan were invited to participate in the survey. The nursing education system in Japan is twofold. One of the paths includes a three-year curriculum for students with a minimum of 16 years' education; this is used in three-year diploma, four-year baccalaureate, and three-year junior college programs. The other includes a two-year curriculum for assistant nurses who wish to become RNs; this is used in two-year diploma; three-year, part-time diploma; two-year junior college; and five-year diploma programs, which combine curricula for training as assistant nurses and RNs.

Of the 878 programs, mailing addresses were identifiable for 833. The 833 programs consisted of 155 four-year baccalaureate, 496 three-year diploma nursing (high school students to RNs), and 182 two-year diploma nursing (assistant nurses to RNs) programs. A set of questionnaires were sent to the directors of the RN programs in June 2011.

Each program director was asked to provide information regarding the program's entrance examination, student support system, number of students enrolled in classes due to graduate in March 2011 (i.e., students were admitted in April of 2007, 2008, or 2009 depending on program length), number of extremely difficult enrolled students, outcomes for extremely difficult students, and participants' perceptions concerning extremely difficult students. Extremely difficult students were defined as those with problems such as inability to perform an ordinal task, lack of awareness of their circumstances, inability to detect implications, extremely bad manners, inability to connect known facts, misunderstanding of common facts, extreme clumsiness, repeated errors in easy Chinese characters (the Japanese written language consists of three types of character: Hiragana, Katakana, and Chinese) and/or simple calculations, lack of interest in others, inability to understand others' perspectives, inability to cope with sudden change, inability to perform simple tasks after repeated training, and lack of success despite repeating practice and/or receiving individual instruction (Ikematsu, 2014).

The participants, preferably nurse educators who were familiar with the students, were also asked to report details regarding extremely difficult students, using another questionnaire, which included a modified battery of questions designed to assess special educational needs, frequently observed behaviors, descriptions of difficult teaching situations, and student outcomes, and contained a free comment space for additional information concerning the student. The battery was originally developed and used in surveys that included elementary and junior high school students, conducted by the MEXT in Japan (Ministry of Education, Culture, Sports, Science, and Technology, 2003). Detailed information regarding the battery was provided in a previous article (Ikematsu, 2014).

In addition to completing these questionnaires, participants were asked to choose up to five behaviors exhibited by each student under stressful and unstressful conditions, from a list of 26 behavioral traits. These behavioral traits were extracted from experiences described by nurse educators, who were contacted by the authors prior to the survey. The scoring generated dichotomous data, (i.e., presence or absence) for each behavior. Not all behaviors were captured for each student, to avoid overscoring because of participants' negative impressions of students. These behaviors were listed in concrete words or phrases to preserve participants' genuine impressions. Questionnaire 1 was completed by program directors, and Questionnaire 2 was completed by educators, such as tutors or clinical instructors, who knew the students well.

The data were analyzed using PASW ver. 18 (IBM, NY). The presence or absence of special needs relevant to LD, ADHD, and HASD in extremely difficult students was determined according to the MEXT battery cutoff points (Ikematsu, 2014). Frequencies for observation of 26 predetermined behavioral traits were calculated

and compared between students with and without special needs. The frequencies were also compared between unstressful and stressful circumstances for both student groups. Differences in behavioral traits between students with and without special needs were determined using a chi-square test, with Fisher's exact test used as appropriate. Changes in behavioral traits between unstressful and stressful circumstances were determined via McNemar's test. The significance level was set at 0.05.

2.1. Definitions

The term "special educational needs" was defined as difficulties involving one or more of the following: "listening," "speaking," "reading," "writing," "mathematics," "reasoning," "inattentiveness," "hyperactivity/impulsivity," and "social interaction/restricted interests" (Ministry of Education, Culture, Sports Science, and Technology, 2003), as determined via a questionnaire developed by the MEXT and modified by the authors. Nursing students with special needs were defined as those who were identified as extremely difficult by the nurse educators and fulfilled the criteria for the MEXT battery.

2.2. Ethical considerations

A cover letter assuring participants of autonomy and anonymity was enclosed with the questionnaires. Identification numbers were printed on the self-addressed return envelopes but not the questionnaires. Envelopes were opened subsequent to receipt of at least 10 responses, and envelopes and questionnaires were stored separately. This procedure made it impossible to relate questionnaires to identification numbers or reveal the names of the schools. To maximize the confidentiality of the reported students' age, sex, and other demographic data were not collected. Consent for participation was assumed with the completion and return of questionnaires. Returned questionnaires were stored in a locked cabinet that was accessible only by the principal investigator. The study was approved by the Research Ethics Committee at the Graduate School of Medicine at Nagoya University. The requirement for informed consent for the students was waived by the committee because informing they had been regarded "difficult to teach" might cause significant psychological distress to the students.

3. Results

Questionnaires were returned for 393 programs. Responses for 341 programs (41.2%) were included in the analysis. The 52 remaining questionnaires were returned blank. In total, 330 of the 14,325 students graduating in 2011 were identified as extremely difficult, with an incidence rate of 2.3% (Ikematsu, 2014). Of these students, traits for 244 were reported using Questionnaire 2. The presence or absence of special educational needs was determined according to the cutoff points used in the MEXT survey. In total, 146 students (1.02%) had one or more special educational needs (i.e., because of difficulties involving "listening," "speaking," "reading," "writing," "mathematics," "reasoning," "inattentiveness," "hyperactivity/impulsivity," or "social interaction/restricted interests"). The most prevalent need resulted from difficulties involving "social interaction/restricted interests" followed by those involving "listening" and "inattentiveness" (Ikematsu, 2014). However, because of profound comorbidity between disorders (Sadock and Sadock, 2009) and a lack of specific trends in the results, students with any type of special needs are hereinafter referred to as "students with special educational needs," and those who did not fall into any category are referred to "students without special

educational needs.”

Of 244 students for whom Questionnaire 2 was returned, behavioral traits observed under both unstressful and stressful circumstances were provided for 223 students (84 without special educational needs and 139 with one or more special needs). An inclusion tree is shown in Fig. 1. The most prevalent behavioral trait observed for nursing students with special needs under unstressful circumstances was “making excessive excuses,” followed by “lapsing into silence,” “watching other’s face (to determine how to behave),” “apologizing frequently,” and “blaming others.” The most prevalent behavioral trait observed under stressful circumstances was “lapsing into silence,” followed by “making excessive excuses,” “hostility,” “crying easily,” and “watching other’s face (to determine how to behave).” The prevalences of each behavior and other results are shown in Table 1.

Significant differences in “blaming others” and “disappearing” were observed between students with and without special educational needs under unstressful circumstances, with both traits observed more frequently in students with, relative to without, special needs. Between-group differences in “blaming others,” “disappearing,” and “staying at home” under stressful circumstances were also statistically significant.

The frequencies with which students without special needs exhibited “hostility,” “quick-temperedness,” “lapsing into silence,” “flattery,” “amiability,” and “somatization” under stressful circumstances were significantly higher relative to those observed under unstressful circumstances. Students with special needs exhibited “crying easily,” “hostility,” “quick-temperedness,” “repeatedly staying at home,” “comic behavior,” “grinning,” “coaxing,” “amiability,” “somatization,” and “disliking attention” significantly more frequently under stressful circumstances than they did under unstressful circumstances.

4. Discussion

This survey revealed behavioral traits observed in nursing students with special educational needs. The proportion of students with special needs whom participants identified as having a tendency to blame others was higher relative to that of students who were difficult to teach but did not have special educational needs. This indicated that students with special needs experienced difficult situations over which they had no control. They could have been protecting themselves by blaming others. However, once they begin working in clinical settings, blaming others, such as colleagues and patients, on a regular basis could seriously impair relationships and lead to an inability to establish rapport or collaborative teamwork. This tendency could also hinder students’ self-growth. Although nurse educators are expected to resolve issues involving students blaming others excessively, they are also required to understand the feelings of powerlessness experienced by these students and be aware of the potential for special educational needs.

Students with special educational needs tended to disappear frequently. This indicated that they lacked close friends and therefore remained alone. In addition, these students could have behaved as they pleased because they were unconcerned about others’ interests. They might not have known that their teachers and friends were concerned about their behavior. Withdrawal from the workplace once working as nurses could result in serious issues for these students. Nurse educators may need to instruct them to inform supervisors or colleagues when they should be at a certain location, such as the nurses’ station, bedside, or classroom, but are or plan to be absent. This instruction should include information regarding when and to whom they should report their location, because they do not understand why they should do this, and

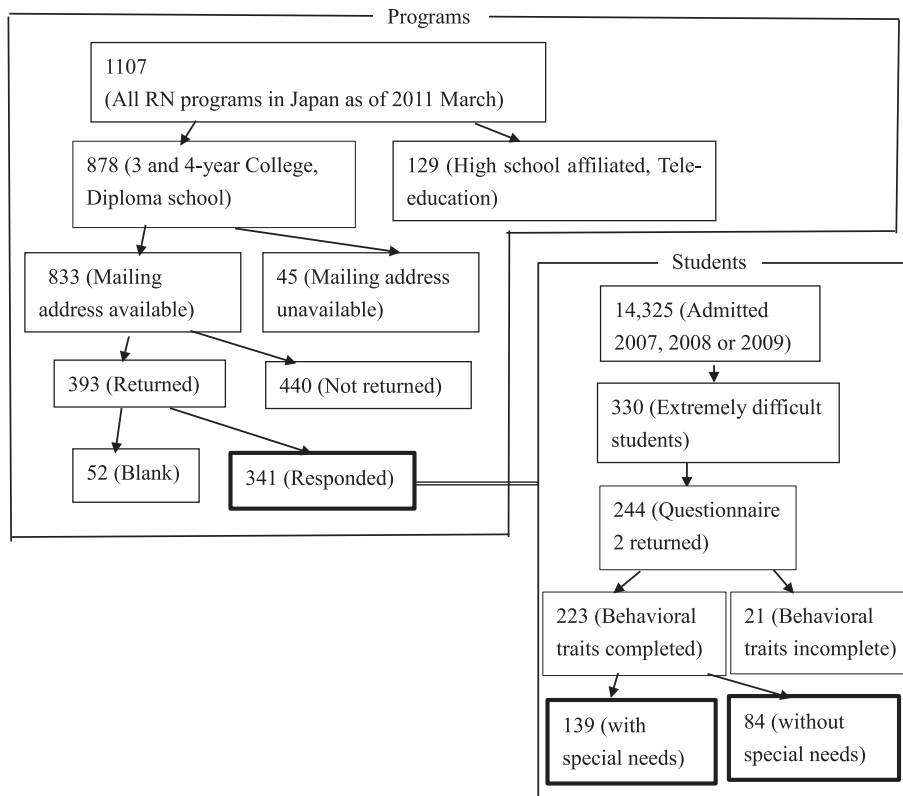


Fig. 1. Inclusion flow of RN (registered nurse) programs and students.

Table 1
Prevalence and ranks of behavioral traits.

| | | Unstressful circumstances | | Stressful circumstances | |
|---|------------|-----------------------------------|---------------------------------|-----------------------------------|---------------------------------|
| | | Without special needs (n = 84) | With special needs (n = 139) | Without special needs (n = 84) | With special needs (n = 139) |
| Crying easily ^d | Prevalence | 8 (9.5%) | 12 (8.6%) | 16 (19.0%) | 38 (27.3%) |
| | Rank | 12 | 15 | 5 | 5 |
| Apologizing frequently | Prevalence | 16 (19.0%) | 32 (23.0%) | 10 (11.9%) | 29 (20.9%) |
| | Rank | 4 | 4 | 11 | 7 |
| Belittling his/herself | Prevalence | 16 (19.0%) | 23 (16.5%) | 12 (14.3%) | 16 (11.5%) |
| | Rank | 4 | 7 | 9 | 13 |
| Ridiculing his/herself | Prevalence | 5 (6.0%) | 13 (9.4%) | 11 (11.9%) | 12 (8.6%) |
| | Rank | 18 | 14 | 10 | 15 |
| Hostility ^{c,d} | Prevalence | 7 (8.3%) | 11 (7.9%) | 21 (25.0%) | 39 (28.1%) |
| | Rank | 14 | 17 | 4 | 4 |
| Quick-temperedness ^{c,d} | Prevalence | 2 (2.4%) | 5 (3.6%) | 15 (17.9%) | 26 (18.7) |
| | Rank | 22 | 23 | 6 | 9 |
| Blaming others ^{a,b} | Prevalence | 9 (10.7%) | 30 (21.6%) | 14 (16.7%) | 40 (28.8%) |
| | Rank | 11 | 5 | 7 | 3 |
| Making excessive excuses | Prevalence | 26 (31.0%) | 47 (33.8%) | 31 (36.9%) | 49 (35.3%) |
| | Rank | 1 | 1 | 2 | 2 |
| Lapsing into silence ^c | Prevalence | 21 (25.0%) | 47 (33.8%) | 34 (40.5%) | 60 (43.2%) |
| | Rank | 3 | 1 | 1 | 1 |
| Disappearing ^{a,b} | Prevalence | 1 (1.2%) | 16 (11.5%) | 2 (2.4%) | 25 (18.0%) |
| | Rank | 23 | 11 | 21 | 10 |
| Staying at home ^{b,d} | Prevalence | 4 (4.8%) | 8 (5.8%) | 6 (7.1%) | 23 (16.5%) |
| | Rank | 19 | 20 | 15 | 11 |
| Comic behavior ^d | Prevalence | 4 (4.8%) | 9 (6.5%) | 0 (0%) | 2 (1.4%) |
| | Rank | 19 | 18 | 23 | 22 |
| Teasing everything | Prevalence | 4 (4.8%) | 8 (5.8%) | 3 (3.6%) | 3 (2.2%) |
| | Rank | 19 | 20 | 19 | 20 |
| Frolicking | Prevalence | 11 (13.1%) | 12 (8.6%) | 5 (6.0%) | 7 (5.0%) |
| | Rank | 8 | 15 | 16 | 17 |
| Grinning ^d | Prevalence | 6 (7.1%) | 22 (15.8%) | 4 (4.8%) | 6 (4.3%) |
| | Rank | 16 | 8 | 18 | 18 |
| Being dependent | Prevalence | 11 (13.1%) | 25 (18.0%) | 9 (10.7%) | 14 (10.1%) |
| | Rank | 8 | 6 | 12 | 14 |
| Coaxing ^d | Prevalence | 7 (8.3%) | 16 (11.5%) | 5 (6.0%) | 3 (2.2%) |
| | Rank | 14 | 11 | 16 | 20 |
| Flattery | Prevalence | 8 (9.5%) | 7 (5.0%) | 2 (2.4%) | 6 (4.3%) |
| | Rank | 12 | 22 | 21 | 18 |
| Watching other's face (to determine how to behave) | Prevalence | 23 (27.4%) | 36 (25.9%) | 24 (28.6%) | 34 (24.5%) |
| | Rank | 2 | 3 | 3 | 6 |
| Changing his/her opinion along with others | Prevalence | 10 (11.9%) | 20 (14.4%) | 8 (9.5%) | 21 (15.1%) |
| | Rank | 10 | 9 | 13 | 12 |
| Amiability ^{c,d} | Prevalence | 12 (14.3%) | 14 (10.1%) | 3 (3.6%) | 1 (0.7%) |
| | Rank | 7 | 13 | 19 | 23 |
| Somatization ^{c,d} | Prevalence | 6 (7.1%) | 9 (6.5%) | 13 (15.5%) | 28 (20.1%) |
| | Rank | 16 | 18 | 8 | 8 |
| Disliking attention ^d | Prevalence | 13 (15.5%) | 18 (12.9%) | 7 (8.3%) | 8 (5.8%) |
| | Rank | 6 | 10 | 14 | 16 |

^a Significant difference between students with and without special needs under unstressful circumstances. (Chi square test).

^b Significant difference between students with and without special needs under stressful circumstances. (Chi square test).

^c Significant difference between unstressful and stressful circumstances among students without special needs. (McNemar test).

^d Significant difference between unstressful and stressful circumstances among students with special needs. (McNemar test).

instructions should be detailed. In addition, it should be noted that their absence could be a manifestation of depression, because a high incidence of anxiety and depression, along with other psychiatric symptoms, has been observed in college students with autistic traits (Kanne et al., 2009). Psychiatric support might be required to help nursing students with special needs to complete nursing programs.

Although a previous study that included college students reported a stronger tendency toward hostility and verbal aggression in HASD students (White et al., 2011), this result was nonsignificant, and the current study did not support these findings. Students with and without special needs became hostile and quick tempered under stressful circumstances, and no between-group differences were observed under unstressful or stressful circumstances. There could be numerous reasons, including differences in measurement, study design, and study population, for this discrepancy. White

et al. (2011) employed self-report and observational evaluation to determine HASD, whereas the current study depended on participants' memories. In addition, the control group used in the current study was not ideal, because these students were identified as difficult to teach by nurse educators and might not have represented all students who do not fulfill the criteria indicating a need for provision of special educational support. It is possible that even-tempered students with special needs selected nursing as a career. Therefore, hostility and quick-temperedness might not be useful for use in identifying nursing students with special educational needs.

Many students who were identified as difficult to teach by nurse educators tended to lapse into silence, regardless of special needs. This could reflect Japanese culture, which values nonconfrontation in the management of conflict, which is instilled in early childhood in Japan (Tomo, 2012). It is possible that the students lapsed into silence, rather than expressing themselves, when they encountered

difficult situations. Although manifestations of developmental disorders are reportedly similar in numerous cultures (Davis et al., 2012; Wakabayashi et al., 2006), the coping behaviors of these students could be influenced by culture. Further investigation is warranted to determine cultural differences in the behaviors of nursing students with special educational needs.

This study employed the definition of “special educational needs” used by the MEXT for a survey that included school-aged children in 2002. This definition was considered suitable because it allowed a comparison with the results of the 2002 survey, which targeted the same population. However, this definition and those of developmental disorders are not universal as mentioned above. It is hoped that universal definitions will be established, to ensure that the global community is able to accumulate knowledge for the further advancement of research examining special educational needs and/or developmental disorders among nursing students.

4.1. Limitations

This study was subject to some limitations. The response rate was lower than the optimal rate, and the return of more than 50 blank responses could indicate selection bias. Responses may have been limited to those from nurse educators who were interested in and/or had experience with difficult students; therefore, the generalizability of the results regarding the behavioral traits observed might be limited.

The accuracy of the determination of the presence or absence of special needs and behavioral traits was suboptimal. Questionnaire completion relied upon the participating nurse educators' recollection, because two thirds of the students had graduated or withdrawn from the program, and only one third remained enrolled, as they had extended their study term. In addition, the study did not exclude conditions other than those involving educational needs. Free descriptions of the students indicated that they might have had other conditions (such as gender identity disorder). In addition, intentional observation and scoring were not possible with the study design.

Although students without special educational needs were included in the control group, they might have had special needs that remained unrecognized because of underscoring due to potentially ambiguous memories in participating educators. Therefore, they did not constitute a true control group. In addition, the detection of differences via Fisher's exact test could have been weak because of poor determinability of effect size. Analysis that is more definitive could be possible in future, if students who are not difficult to teach are compared with students with special needs.

The battery of questions used might not have been suitable for assessment of nursing students, because it was developed for use with younger schoolchildren. In addition, the sensitivity and specificity of the original version of the questionnaire have not been determined. Although some instruments have been developed to measure developmental disorders in college students (Baron-Cohen et al., 2001, 2005; Glutting et al., 2002), Japanese versions of these instruments were not available at the time of data collection. The use of the MEXT battery was preferred to the translation of these instruments, because the nursing students surveyed in the current study were the schoolchildren who were surveyed in 2002. Using the same questionnaire was considered to allow comparison between the results of the two surveys. Restriction of the list of identified behaviors to five could be another limitation of the study. Less obvious behaviors that were not identified by participants could also have been present in the students. Purposeful observation could overcome this limitation in future research.

Despite these limitations, some significant findings indicated

that this method could provide some information regarding the behavioral traits of nursing students with special educational needs.

4.2. Future directions

This survey results revealed the behaviors of nursing students with special educational needs. Because the retrospective survey design limited credibility, a prospective survey is warranted to capture accurate information concerning these behaviors. Associating specific behaviors with special needs could facilitate the early identification of students with special needs. Early intervention is crucial to students' adjustment to higher education. Interventions that are essential to nursing education should be developed in future.

4.3. Conclusion

Some students enrolled in the nursing programs clearly had special educational needs related to developmental disorders. These students tended to make excessive excuses, lapse into silence, and watch other's face (to determine how to behave). They blamed others and withdrew more often relative to students who were identified as difficult to teach but did not have special needs. Nurse educators should consider the possibility of special educational needs when they encounter difficult students who exhibit these behaviors.

Sharing these findings with nursing education communities worldwide could increase awareness of these students and the need for research that examines the issue further. International collaboration in research could result in the development of universal knowledge concerning these students, which could assist the students and their educators. Therefore, we chose to submit the article to an international journal for publication.

Conflict of interest statement

The authors declare no conflicts of interest in this work.

Role of the funding source

This study was supported by the Japan Society for the Promotion of Science (Exploratory Research Program #21659496).

Author contribution

All authors listed on the title page participated in the full process of the designing, planning, and conducting the study.

Acknowledgements

This study was supported by the Japan Society for the Promotion of Science. (Exploratory Research Program #21659496). The authors acknowledge Masako Mizutani, Hiroaki Tozaka and Sachiko Mori for their contributions to this study.

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