Menstrual Care Experiences and Support Needs of Girls and Women with Neurodevelopmental Characteristics in Japan: A Caregiver- and Supporter-Reported Exploratory Cross-Sectional Study

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ABSTRACT:

Background: Menstrual care is an important daily living skill related to privacy, dignity, school participation, and inclusive support. Girls and women with neurodevelopmental characteristics may experience additional challenges related to cognitive understanding, communication, sensory sensitivity, motor skills, and dependence on caregivers or educational staff.

Aim: This study described menstrual care experiences and support needs among girls and women with neurodevelopmental characteristics in Japan.

Methods: A cross-sectional web-based survey was conducted in collaboration with a community-based parent and supporter group as part of a local government–commissioned community project in Japan. Of 50 responses, 48 were analyzed because the girls or women had experienced menarche. Descriptive statistics, selected exploratory group comparisons using Fisher's exact tests, and inductive content analysis of open-ended responses were used.

Results: Disposable pads were the dominant menstrual product, used as the main product by 43 respondents (89.6%). The most common practical difficulties were determining the timing of product changes (52.1%), handling menstrual products (43.8%), and changing products outside the home or school (27.1%). Daily-life difficulties included indifference to menstrual blood (39.6%), irritability affecting usual activities (31.3%), and fatigue affecting usual activities (16.7%). Open-ended responses showed individualized strategies, including product combinations, visual support, verbal prompting, collaboration with schools or services, and symptom management.

Conclusion: Menstrual care for girls and women with neurodevelopmental characteristics should be framed as daily living skills education and inclusive support. Individualized, visually supported, and developmentally appropriate menstrual education

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should be coordinated across home, school, health, and community settings.

Keywords: menstrual care; neurodevelopmental disabilities; intellectual disability; autism spectrum disorder; daily living skills; special education; Japan

1. Introduction

Menstruation is a major developmental transition that affects bodily awareness, daily routines, self-care, privacy, school participation, and psychosocial well-being. For girls and women with intellectual and developmental disabilities, menstruation may be accompanied by additional challenges related to cognitive understanding, communication, sensory sensitivity, executive functioning, motor skills, and dependence on caregivers or educational staff. Menstrual care therefore should not be understood only as a matter of hygiene; rather, it is closely connected to daily living skills education, bodily autonomy, dignity, and inclusive support.

Previous studies have shown that menstruating people with disabilities face multiple barriers to menstrual hygiene management, including limited access to appropriate information, insufficient caregiver and professional guidance, stigma, environmental barriers, and lack of disability-sensitive interventions. In a systematic review, Wilbur et al. (2019) examined menstrual hygiene management requirements, barriers, and strategies among disabled people and emphasized that menstruation and disability can produce overlapping forms of stigma and exclusion. The review also highlighted the need for interventions that support disabled people to manage menstruation hygienically and with dignity.

For girls and women with intellectual disability, menstrual care often requires practical instruction and individualized support. Caregivers may need to assist with recognizing menstrual onset, selecting appropriate products, changing pads, disposing of used products, maintaining genital hygiene, and responding to behavioural or emotional changes. Chou et al. (2009) reported menstrual symptoms among institutionalized women with intellectual disability, indicating that menstrual-related symptoms and support needs are relevant even in highly supported settings. Chou and Lu (2012) further explored mothers' experiences of managing menstruation for daughters with intellectual disabilities, demonstrating that families play a central role in menstrual care.

Menstrual experiences may also be particularly complex for autistic girls and women. Hamilton et al. (2011) assessed menstruation among young women with autism spectrum disorders through caregiver reports and found that hygiene concerns, dysmenorrhea, premenstrual symptoms, and treatment issues were commonly reported. Steward et al. (2018) further showed that autistic people may experience menstruation as difficult to manage, with challenges related to pain, emotional regulation, sensory sensitivity, and daily routines. More recent research has continued to point to the importance of examining reproductive health across the lifespan among autistic people. For example, Groenman et al. (2022) noted that autism has historically been understood largely through a male-focused lens, contributing to limited knowledge about reproductive and menstrual experiences among autistic women.

Educational intervention studies suggest that menstrual care skills can improve when instruction is concrete, structured, and developmentally appropriate. Altundağ and Çalbayram (2016) demonstrated that pad replacement skills could be taught to adolescent female students with intellectual disabilities through demonstration using a dummy. Kaydırak et al. (2023) reported that menstrual hygiene skills training for adolescents with autism was beneficial in increasing menstrual hygiene skills. Similarly, Kırbaş et al. (2022) showed that menstrual care skills among female adolescent students with intellectual disabilities improved after training and peer training. In Japan, Tsuda and Takada (2024) examined a menstrual education program using visual supports and a doll model for preadolescent girls with intellectual disability and high support needs, suggesting the usefulness of visual and step-by-step teaching approaches.

However, the existing literature also indicates important gaps. A recent systematic review of menstrual education programs for girls and young women with intellectual and developmental disabilities found that menstrual education interventions have largely focused on pad-replacement skills, while broader issues such as product choice, emotional regulation, communication of discomfort, family–school collaboration, and support in community settings remain less fully addressed (Randall et al., 2024). This gap is especially important in special and inclusive education contexts, where menstrual support often involves not only the individual but also parents, teachers, school nurses, welfare-service staff, and community supporters.

In Japan, practical knowledge regarding menstrual care for girls and women with neurodevelopmental characteristics remains limited, particularly from the perspective of caregivers and supporters. Although visual supports and structured menstrual education have begun to be evaluated, less is known about how families and supporters manage menstrual products, underwear, pad-changing routines, pain, emotional changes, leakage prevention, and communication difficulties in daily life. Understanding these real-world practices is necessary for developing educational materials and support systems that are accessible, culturally appropriate, and responsive to individual sensory, cognitive, and functional needs.

Therefore, the present study aimed to describe menstrual care experiences and support needs among girls and women with neurodevelopmental characteristics in Japan, based primarily on caregiver and supporter reports in family, school, and community contexts. Specifically, this study examined: (1) menstrual product and underwear use; (2) satisfaction with menstrual products and underwear; (3) practical and daily-life difficulties during menstruation; (4) individualized coping strategies used by families and supporters; and (5) exploratory differences in menstrual care difficulties according to neurodevelopmental characteristics and satisfaction with menstrual products. By framing menstrual care as a component of daily living skills education and inclusive support, this study seeks to contribute practical evidence for special education, family support, and community-based menstrual health education.

2. Methodology

Design:

This study used a cross-sectional descriptive survey design. A web-based questionnaire was administered to examine menstrual care experiences, menstrual product use, daily-life difficulties during menstruation, and support needs among girls and women with neurodevelopmental characteristics in Japan. The study was designed as an exploratory descriptive study because limited empirical evidence is available regarding the practical menstrual care needs of girls and women with neurodevelopmental disabilities in Japanese family, school, and community contexts.

Setting and Community Partnership

The survey was conducted in collaboration with a community-based parent and supporter group

in Japan. The community-based parent and supporter group focuses on menstrual care issues among girls with developmental characteristics and aims to create opportunities for families and supporters to exchange practical information. The present survey was implemented as part of a local government–commissioned community project, which sought to make menstrual care issues more visible and to promote inclusive community support.

The research team collaborated with BirdConnect in disseminating the web-based survey to families and supporters. The community partnership was important because menstruation is a sensitive topic and because families of girls and women with neurodevelopmental characteristics may have limited opportunities to discuss menstrual care concerns openly.

Participants

Eligible respondents were caregivers, family members, supporters, or girls and women with neurodevelopmental characteristics who had experienced menarche. Neurodevelopmental characteristics were based on respondent reports and included diagnosed or suspected intellectual disability, autism spectrum characteristics, attention-deficit/hyperactivity disorder, learning disability, and related developmental or functional difficulties. When the girl or woman had difficulty answering independently, caregivers or supporters were asked to respond based on their daily care experiences. Respondents could also answer after asking the individual about her experiences when possible.

A total of 50 responses were obtained. For the main analysis, responses were limited to girls and women who had experienced menarche. Two responses from individuals who had not yet experienced menarche were excluded from analyses related to menstrual product use, satisfaction, and menstrual care difficulties. Therefore, the final analytic sample consisted of 48 responses.

Recruitment and Data Collection Procedure

Participants were recruited through the collaborating community-based parent and supporter group. The group disseminated information about the survey to families and supporters who were connected to girls and women with developmental characteristics. The survey was administered online using a Google Forms questionnaire. The survey page began with an explanation of the study purpose, voluntary participation, data handling, anonymity, and contact information for the researcher.

Before answering the questionnaire, respondents were asked to indicate their consent by selecting the consent option on the first page of the web survey. Only those who provided consent proceeded to the questionnaire items. Data collection was conducted from March 1 to April 30, 2026.

Questionnaire

The questionnaire was developed to capture practical menstrual care experiences and support needs. It included both closed-ended and open-ended items.

The questionnaire asked about respondent type, the girl's or woman's neurodevelopmental characteristics, age, age at menarche, and experiences at the time of menarche. Respondents were then asked about menstrual product use, including disposable pads, tampons, menstrual cups, and body-held menstrual products. In this survey, body-held menstrual products referred to products worn close to the body to absorb menstrual blood, such as interlabial or body-fitted menstrual products. For each product, respondents selected whether it was mainly used, occasionally used, known but not used, not known, or not known but of interest.

The survey also asked about menstrual underwear use, including waterproof menstrual underwear, shorts-type pads, absorbent menstrual underwear, and usual underwear. Satisfaction with the main menstrual product and menstrual underwear was assessed using five-point Likert-type scales ranging from 1,

indicating dissatisfaction, to 5, indicating satisfaction.

Practical menstrual care difficulties were assessed using multiple-response items. This included difficulty handling menstrual products, refusal to use menstrual products, refusal to change into menstrual underwear, difficulty determining the timing of product changes, difficulty changing products outside the home or school, and no difficulty.

Daily-life difficulties during menstruation were also assessed using multiple-response items. These included indifference to menstrual blood, panic or distress when seeing menstrual blood, difficulty managing medication for abdominal or back pain, pain interfering with daily life, irritability affecting usual activities, fatigue affecting usual activities, difficulty attending school or services, and no particular difficulty.

Open-ended questions asked respondents to describe strategies or tools they used to address menstrual care difficulties and to identify information they wanted to know, such as how to support pad-changing routines or menstrual management.

Data Analysis

Descriptive statistics were used to summarize respondent characteristics, neurodevelopmental characteristics, menstrual product use, menstrual underwear use, satisfaction ratings, menstrual care difficulties, and support needs. Categorical variables were presented as frequencies and percentages. Because several items allowed multiple responses, percentages were calculated using the number of valid respondents for each item as the denominator.

The main analysis was limited to girls and women who had experienced menarche. Satisfaction ratings on five-point Likert-type scales were summarized using medians and interquartile ranges because these items were ordinal.

Exploratory group comparisons were conducted using Fisher's exact test because of the small sample size and expected cell counts below five. These comparisons were exploratory, and p values were not adjusted for multiple comparisons. Comparisons were limited to clinically meaningful groupings, including individuals with intellectual disability only and those with intellectual disability accompanied by autism spectrum characteristics. Satisfaction with menstrual products was also dichotomized into low-to-moderate satisfaction and high satisfaction for exploratory comparisons with menstrual care and daily-life difficulties.

Open-ended responses were analysed using inductive content analysis. Responses were read repeatedly, and meaningful units related to menstrual care strategies and support needs were identified. Similar responses were coded and grouped into subcategories. These subcategories were then organized into broader categories, including product-based adjustments, leakage prevention, visual and concrete supports, prompting and routines, family–school or service collaboration, emotional and sensory support, medical and symptom management, and individualized adaptation. To enhance credibility, the initial coding and categories were reviewed by the research team, and discrepancies were discussed until consensus was reached.

Because this was an exploratory descriptive study with a small sample size, multivariable analyses were not conducted.

Ethical Considerations

This study was approved by the Chubu University Research Ethics Committee in Japan. The approval number was 20250036. All respondents were informed of the purpose of the study, the voluntary nature of participation, the anonymous nature of the web-based survey, data management procedures, and the absence of disadvantages for non-participation.

Informed consent was obtained electronically at the beginning of the survey. Respondents could proceed to the questionnaire only after indicating their consent. Because the survey was anonymous and did not collect personally identifiable information, respondents were informed that withdrawal after submission would be difficult.

Special ethical consideration was given to the sensitive nature of menstruation and to the inclusion of girls and women with neurodevelopmental characteristics. When individuals could not respond independently, caregivers or supporters responded based on their daily support experiences. Respondents were instructed to answer only within a range they felt comfortable sharing. The survey did not require disclosure of names, addresses, school names, or other directly identifiable information.

3. Results

Participant Characteristics

Of the 50 responses obtained, 48 were included in the main analysis because the girls or women had experienced menarche. Two responses from individuals who had not yet experienced menarche were excluded from analyses related to menstrual product use, satisfaction, and menstrual care difficulties.

Among the 48 analysed responses, 40 were provided by caregivers or family members, seven were provided by caregivers or family members based on interviews with the girl or woman herself, and one was provided by a supporter. Intellectual disability was the most frequently reported neurodevelopmental characteristic, followed by autism spectrum characteristics. Because neurodevelopmental characteristics could be selected as multiple responses, the total percentage exceeded 100%.

Table 1. Characteristics of Respondents and Girls/Women

Variable	n	%
Respondent type		
Caregiver/family member	40	(83.3)
Caregiver/family member interviewing the individual	7	(14.6)
Supporter	1	(2.1)
Neurodevelopmental characteristics, multiple responses allowed		
Intellectual disability	41	(85.4)
Autism spectrum characteristics	18	(37.5)
ADHD characteristics	4	(8.3)
Learning disability	1	(2.1)
Other / severe motor or medical disability	2	(4.2)
Main diagnostic/characteristic combinations		
Intellectual disability only	27	(56.3)
Intellectual disability + autism spectrum characteristics	11	(22.9)
Intellectual disability + autism spectrum characteristics + ADHD	3	(6.3)
Autism spectrum characteristics only	3	(6.3)
ADHD only	1	(2.1)

Autism spectrum characteristics + learning disability	1	(2.1)
Other / severe motor or medical disability	2	(4.2)

Note. N = 48. Neurodevelopmental characteristics were multiple-response items; therefore, percentages may exceed 100%.

Menstrual Product and Underwear Use

Disposable pads were the dominant menstrual product. Forty-three respondents, or 89.6%, reported disposable pads as the main menstrual product. In contrast, tampons, menstrual cups, and body-held menstrual products were rarely used and were more often reported as known but not used or unknown. For menstrual underwear, waterproof menstrual underwear was the most frequently reported main type of underwear, followed by absorbent menstrual underwear and usual underwear.

Table 2. Use and Awareness of Menstrual Products and Underwear

Product or underwear type	Mainly used n (%)	Occasionally used n (%)	Known but not used n (%)	Did not know n (%)
Menstrual products				
Disposable pads	43 (89.6)	0 (0.0)	4 (8.3)	1 (2.1)
Tampons	1 (2.1)	1 (2.1)	40 (83.3)	6 (12.5)
Menstrual cups	0 (0.0)	0 (0.0)	35 (72.9)	13 (27.1)
Body-held menstrual product	0 (0.0)	1 (2.1)	27 (56.3)	20 (41.7)
Menstrual underwear				
Waterproof menstrual underwear	31 (64.6)	3 (6.3)	13 (27.1)	1 (2.1)
Shorts-type pad	2 (4.2)	4 (8.3)	36 (75.0)	6 (12.5)
Absorbent menstrual underwear	8 (16.7)	2 (4.2)	30 (62.5)	8 (16.7)
Usual underwear	7 (14.6)	8 (16.7)	33 (68.8)	0 (0.0)

Note. N = 48. Percentages were calculated using 48 as the denominator. Body-held menstrual products refer to products worn close to the body to absorb menstrual blood, such as interlabial or body-fitted menstrual products.

Reasons for Product Use and Satisfaction

The most frequently reported reason for using the main menstrual product was ease of use, followed by familiarity and availability. Satisfaction with the main menstrual product was moderate, with a median score of 3.0. In contrast, satisfaction with menstrual underwear was slightly higher, with a median score of 4.0.

Table 3. Reasons for Product Use and Satisfaction with Menstrual Products and Underwear

A. Reasons for using the main menstrual product (n= 48)

Reason	n	(%)
Easy to use	40	(83.3)
Familiar / accustomed	24	(50.0)
Available anywhere	21	(43.8)
Convenient to carry	16	(33.3)
Affordable	12	(25.0)
Easy to dispose of / manage afterward	7	(14.6)
No better alternative	6	(12.5)
Hygienic	6	(12.5)
Comfortable	3	(6.3)
Other	4	(8.3)

B. Satisfaction with menstrual products and underwear

Item	Valid n	Median	IQR
Main menstrual product	46	3	3.0–4.0
Main menstrual underwear	45	4	3.0–4.0

C. Reasons for low-to-moderate satisfaction with the main menstrual product (n = 24)

Reason	n	(%)
Economic burden	9	(37.5)
Difficult disposal / aftercare	8	(33.3)
Unpleasant feeling	5	(20.8)
Not easy to handle	5	(20.8)
Hygiene concern	0	(0.0)
Other	5	(20.8)

Note. Valid n varied because of missing responses.

Multiple responses were allowed for reasons for product use and reasons for low-to-moderate satisfaction. Satisfaction was rated on a five-point scale from 1 = dissatisfied to 5 = satisfied.

Difficulties in Menstrual Care and Daily Life During Menstruation

The most frequently reported practical difficulty was determining the appropriate timing of menstrual product changes, followed by difficulty handling menstrual products and difficulty changing products outside the home or school. Regarding daily life during menstruation, the most frequently reported difficulty was indifference to menstrual blood, followed by irritability affecting usual activities and fatigue affecting usual activities.

Table 4. Reported Difficulties in Menstrual Care and Daily Life During Menstruation (n=48)

Difficulty	n	(%)
Practical menstrual care difficulties		
Difficulty determining the timing of product changes	25	(52.1)
Difficulty handling menstrual products	21	(43.8)
Difficulty changing products outside home/school	13	(27.1)
No particular difficulty	10	(20.8)
Refusal to use menstrual products	8	(16.7)
Refusal to change into menstrual underwear	2	(4.2)
Daily life difficulties during menstruation		
Indifference to menstrual blood	19	(39.6)
Irritability affecting usual activities	15	(31.3)
Fatigue affecting usual activities	8	(16.7)
No particular difficulty	8	(16.7)
Pain interfering with daily life	6	(12.5)
Pain present but medication management difficult	5	(10.4)
Difficulty attending school or services	2	(4.2)
Panic or distress when seeing menstrual blood	1	(2.1)

Note. Multiple responses were allowed.

Individualized Coping Strategies and Support Needs

Open-ended responses indicated that families and supporters used individualized and practical strategies to manage menstrual care. These included combining multiple products, using larger or longer pads, choosing familiar products, providing verbal prompts, using visual or concrete supports, sharing support with teachers or day-service staff, and managing pain or emotional changes with medication or careful observation. The qualitative categories are shown in Table 5.

Table 5. Categories of Coping Strategies and Support Needs Identified from Open-Ended Responses

Category	Subcategory	Examples from responses	Educational or support implications
Product-based adjustments	Use of familiar or preferred products	Continued use of the same type of product; use of a pad recommended by a trusted teacher; selection of cotton or affordable products	Product choice should consider familiarity, sensory comfort, cost, and acceptance by the individual.
Product-based adjustments	Combining multiple products	Absorbent underwear plus pads; menstrual diapers plus pads; paper diapers plus urinary pads	Layered product use may reduce leakage and caregiver anxiety.
Situation-based product selection	Selecting products according to context	Larger pads, longer pads, night pads used during daytime, larger pantyliners near the end of menstruation	Menstrual education should include practical decision-making about product choice according to flow, time of day, and location.
Leakage prevention and physical adaptation	Managing leakage related to posture or movement	Larger pads for backward leakage; attention to sitting posture; adjustment of pad position	Support should consider motor function, posture, seating, and ADL characteristics.
Visual and concrete supports	Visual tools for understanding and communication	Emotion cards, color-coded pad sizes, menstruation procedure cards	Visual supports may help with understanding, communication, and step-by-step routines.
Prompting and routines	Verbal prompting by family and supporters	Reminders to change products; frequent toilet guidance; checking at home	Prompting should be consistent across home, school, and services.
Family-school/service collaboration	Shared support by teachers and day-service staff	Teachers or day-service staff are asked to provide reminders; products recommended by trusted teachers	Collaboration among families, teachers, school nurses, and service staff is essential.
Emotional and sensory support	Monitoring mood and emotional changes	Watching over mood fluctuations; using cards to check feelings; supporting irritability or discomfort	Menstrual support should include emotional and sensory regulation, not only hygiene.
Medical and symptom management	Pain relief and medication use	Taking pain medication; using prescribed medication; starting herbal medicine	Families may need accessible information on menstrual pain, medication, and consultation with health professionals.

Individualized adaptation process	Trial and error after menarche	Unstable cycle and flow soon after menarche; learning patterns over time	Support plans should allow an adaptation period and be revised as menstrual patterns become clearer.
Functional and environmental limitations	Difficulties related to motor skills or toileting	Difficulty changing pads; difficulty using winged pads; limited availability of non-winged pads; diaper use in daily life	Product design and instruction should address fine-motor skills, toileting independence, and availability of accessible products.

Exploratory Group Comparisons by Neurodevelopmental Characteristics

Exploratory Fisher's exact tests were conducted to compare menstrual care difficulties between individuals with intellectual disability only and those with intellectual disability accompanied by autism spectrum characteristics. The results are presented in Supplementary Table 1. The intellectual disability-only group included 27 respondents, and the intellectual disability with autism spectrum characteristics group included 14 respondents. Most difficulties did not differ significantly between the two groups. Fatigue affecting usual activities was more frequently reported in the group with intellectual disability accompanied by autism spectrum characteristics than in the intellectual disability-only group. However, because of the small sample size, multiple exploratory comparisons, and absence of adjustment for multiple testing, this finding should be interpreted as a preliminary pattern rather than confirmatory evidence.

Exploratory Comparisons by Satisfaction with Menstrual Products

Respondents were also divided into low-to-moderate satisfaction and high satisfaction groups based on satisfaction with the main menstrual product. The results are presented in Supplementary Table 2. The low-to-moderate satisfaction group included those who selected scores of 1 to 3, and the high satisfaction group included those who selected scores of 4 or 5. Of the 46 respondents with valid satisfaction ratings, 24 were classified into the low-to-moderate satisfaction group and 22 into the high satisfaction group.

Irritability affecting usual activities was more frequently reported among respondents with low-to-moderate satisfaction than among those with high satisfaction. However, this association should be interpreted cautiously because the analysis was exploratory and does not imply causality. Other menstrual care and daily-life difficulties did not differ significantly between the groups.

Overall, the findings indicated that menstrual care difficulties extended beyond product handling. Families and supporters reported difficulties with timing product changes, managing product use outside familiar environments, responding to indifference to menstrual blood, and supporting emotional or physical symptoms during menstruation. Open-ended responses suggested that support was highly individualized and often involved product adjustments, prompting, visual support, collaboration with schools or services, and symptom management. Exploratory comparisons suggested possible preliminary patterns between intellectual disability accompanied by autism spectrum characteristics and fatigue, and between lower product satisfaction and irritability; however, these findings should be interpreted cautiously because of the small sample size, multiple comparisons, and cross-sectional design.

4. Discussion

The present study examined menstrual care experiences and support needs among girls and

women with neurodevelopmental characteristics in Japan, based primarily on caregiver and supporter reports. The findings showed that menstrual care difficulties extended beyond the simple handling of menstrual products. Although disposable pads were the dominant menstrual product, many respondents reported difficulties related to determining the appropriate timing of product changes, handling menstrual products, changing products outside familiar environments, indifference to menstrual blood, irritability, fatigue, and pain. Open-ended responses further indicated that families and supporters relied on individualized strategies, including product combinations, larger or longer pads, visual supports, verbal prompting, collaboration with schools and services, and medication or symptom management.

Menstrual care as daily living skills education

A key finding of this study is that menstrual care should be understood as part of daily living skills education rather than as a purely hygienic task. More than half of the respondents reported difficulty determining the timing of product changes, and 43.8% reported difficulty handling menstrual products. These findings suggest that menstrual care support requires explicit teaching of routines, timing, product selection, disposal, and help-seeking behaviors.

This finding is consistent with previous studies showing that girls with intellectual and developmental disabilities may benefit from structured menstrual education and step-by-step teaching. Altundağ and Çalbayram (2016) demonstrated that pad replacement skills among intellectually disabled female students could be improved through demonstration using a dummy. Kaydırak et al. (2023) reported that menstrual hygiene skills training improved menstrual hygiene skills among adolescents with autism. Similarly, Tsuda and Takada (2024) found that a comprehensive menstrual health education program using visual support and a doll model was effective for preadolescent girls with intellectual disability and high support needs in Japan. These studies support the idea that menstrual care can be taught when instruction is concrete, repeated, visually supported, and adapted to the individual's developmental level.

The present study adds to this literature by showing that families and supporters are already using practical strategies in daily life, such as product layering, larger pads, color coding, procedure cards, and consistent prompting. These findings suggest that future menstrual education programs should not focus only on pad replacement. Instead, they should include broader daily living skills, such as recognizing menstrual flow, choosing appropriate products, managing changes in different settings, communicating discomfort, and seeking support.

Product familiarity, limited choice, and individualized support

Disposable pads were used by almost 90% of the sample. The main reasons for product use were ease of use, familiarity, and availability. This finding suggests that product choice may be shaped not only by comfort or suitability but also by routine, availability, and what caregivers and supporters find manageable. At the same time, satisfaction with menstrual products was only moderate, with many respondents selecting the midpoint of the satisfaction scale.

This finding is important because menstrual product choice is closely related to autonomy, comfort, leakage prevention, sensory tolerance, and participation in school or community life. Wilbur et al. (2019) emphasized that disabled people may face multiple barriers to menstrual hygiene management, including lack of appropriate information, environmental barriers, stigma, and insufficient support. In the present study, limited use of tampons, menstrual cups, and other products may reflect developmental appropriateness and personal preference, but it may also reflect limited information or limited access to adapted guidance.

Therefore, menstrual care support should avoid assuming that one product is appropriate for all girls and women with neurodevelopmental characteristics. Instead, product selection should be individualized according to cognitive understanding, sensory preferences, motor skills,

menstrual flow, toileting independence, cost, disposal burden, and family or school support systems. The qualitative results also suggest that product combinations, such as absorbent underwear with pads or menstrual diapers with pads, may be useful for some individuals. Such strategies should be regarded as adaptive support rather than as failure to achieve independence.

Emotional, sensory, and physical aspects of menstruation

The findings also show that menstrual care difficulties include emotional, sensory, and physical dimensions. Indifference to menstrual blood was reported by 39.6% of respondents, irritability affecting usual activities by 31.3%, and fatigue affecting usual activities by 16.7%. Although panic or distress when seeing menstrual blood was uncommon in this sample, emotional and behavioral changes were still notable.

Previous research has suggested that menstruation can be particularly complex for autistic girls and women. Hamilton et al. (2011) examined menstruation among young women with autism spectrum disorders through caregiver reports and identified concerns related to hygiene, dysmenorrhea, premenstrual symptoms, and treatment. Steward et al. (2018) reported that autistic respondents described menstruation as difficult to manage, including challenges related to sensory sensitivity, pain, emotional changes, and disruption of daily routines. Groenman et al. (2022) also noted that menstruation and menopause have been underexamined in autistic adults because autism has historically been studied through a male-focused lens. These studies indicate that reproductive health events may interact with autistic traits, sensory experiences, and emotional regulation.

In the present study, exploratory analysis suggested that fatigue affecting usual activities was more frequently reported among girls and women with intellectual disability accompanied by autism spectrum characteristics than among those with intellectual disability only. This result should be interpreted cautiously because of the small sample size and multiple exploratory comparisons. Although this finding is preliminary, it highlights the importance of considering fatigue, sensory discomfort, emotional regulation, and changes in daily functioning when planning menstrual support for individuals with autism spectrum characteristics, in addition to hygiene skills.

In addition, respondents with low-to-moderate satisfaction with menstrual products were more likely to report irritability affecting usual activities. This relationship cannot be interpreted causally, but it raises the possibility that product-related discomfort, leakage concerns, sensory unpleasantness, or disposal burden may be linked to emotional distress during menstruation. Future research should examine the relationship between product satisfaction, sensory sensitivity, pain, emotional regulation, and participation in school or daily activities.

Family, school, and service collaboration

The open-ended responses highlighted the importance of collaboration across home, school, and community services. Families reported asking teachers or day-service staff to provide reminders, sharing routines, using products recommended by trusted teachers, and relying on verbal prompting across settings. These findings indicate that menstrual care for girls and women with neurodevelopmental disabilities is not managed by the individual or family alone. It often depends on a network of supporters.

This is consistent with Chou and Lu's (2012) qualitative study, which showed that mothers played a central role in managing menstruation for daughters with intellectual disabilities. Caregiver involvement is often essential, but the present findings suggest that families also need support from schools, welfare services, and health professionals. If menstrual support is inconsistent across settings, the individual may become confused or may not be able to generalize skills from home to school or community settings.

For special education practice, this means that menstrual care should be included in individualized support planning. Teachers,

school nurses, caregivers, and service providers should share information about product use, timing of changes, cueing methods, pain management, privacy, and emergency responses. Menstrual education should also be framed as part of health education, sexuality education, self-care instruction, and inclusive daily living support.

Implications for special and inclusive education

The findings have several implications for special and inclusive education. First, menstrual education should begin before menarche when possible. Previous Japanese research has shown the usefulness of visual supports and a doll model for teaching menstrual hygiene management before menarche among girls with intellectual disability and high support needs (Tsuda & Takada, 2024). The present findings support the need for anticipatory education, because families reported difficulties related to product handling, timing, emotional responses, and adaptation after menarche.

Second, menstrual education should be individualized and multimodal. Visual supports, concrete materials, procedure cards, color coding, and repeated practice may be particularly useful for students who have difficulty understanding abstract explanations. However, education should not be limited to the mechanical act of changing pads. It should also include bodily awareness, privacy, help-seeking, pain communication, product choice, disposal, and coping with unexpected situations.

Third, menstrual support should respect dignity and autonomy. Wilbur et al. (2019) emphasized that disabled people should be supported to manage menstruation hygienically and with dignity. In educational contexts, this means avoiding overly restrictive or caregiver-centered approaches and instead promoting supported decision-making wherever possible. Even when full independence is not realistic, students can often participate in parts of the routine, express preferences, choose products, recognize discomfort, or ask for help.

Finally, the findings suggest that menstrual care is a community issue as well as a school issue. Because this study was conducted in collaboration with a community-based parent group as part of a municipal project, it shows the potential value of parent-led and community-partnered approaches. Community organizations can help identify hidden needs, create safe spaces for discussion, and translate research findings into practical resources for families and schools.

Limitations

This study has several limitations. First, most responses were provided by caregivers or supporters rather than by the girls or women themselves. Therefore, the findings primarily reflect caregiver and supporter perspectives. Although proxy reporting was necessary for individuals who had difficulty answering independently, future studies should incorporate accessible methods to include the direct voices of girls and women with neurodevelopmental disabilities.

Second, the sample was small and recruited through a community-based parent group. Families connected to such a group may be more interested in menstrual care or more motivated to seek information than families who are not connected to community support networks. Therefore, the findings may not be generalizable to all girls and women with neurodevelopmental characteristics in Japan. In addition, neurodevelopmental characteristics were reported by caregivers or supporters and were not independently verified through clinical assessment or medical records.

Third, the study was cross-sectional and descriptive. Causal relationships cannot be inferred. For example, the association between lower menstrual product satisfaction and irritability may reflect product discomfort, menstrual symptoms, sensory sensitivity, or other unmeasured factors.

Fourth, the exploratory Fisher's exact tests were conducted with small group sizes and were not adjusted for multiple comparisons. Therefore, p values should be interpreted descriptively, and

statistically significant findings should be regarded as preliminary patterns for future research rather than definitive evidence.

Finally, the survey did not include detailed clinical measures of menstrual symptoms, sensory sensitivity, adaptive functioning, or communication ability. Future research should use validated measures and larger samples to clarify how neurodevelopmental characteristics, sensory processing, pain, emotional regulation, and environmental support interact during menstruation.

5. Conclusion

This study suggests that menstrual care for girls and women with neurodevelopmental characteristics in Japan involves practical, emotional, sensory, educational, and relational dimensions. Disposable pads were the dominant menstrual product, but many respondents reported difficulties with product handling, timing of changes, product use outside familiar settings, indifference to menstrual blood, irritability, fatigue, and pain. Families and supporters used individualized strategies, including product combinations, visual supports, prompting, school or service collaboration, and symptom management.

These findings support the need to frame menstrual care as part of daily living skills education and inclusive support. Menstrual education for girls and women with neurodevelopmental disabilities should be individualized, visually supported, developmentally appropriate, and coordinated across home, school, health, and community settings. Future intervention studies should develop and evaluate menstrual education programs that address not only pad-changing skills but also product choice, sensory and emotional support, communication, dignity, and participation in daily life.

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8. Author Declaration

The authors confirm that this work is original and has not been published previously, nor is it under consideration for publication elsewhere. All authors have read and approved the final version of the manuscript.

The authors declare that they have no conflicts of interest.

Supplementary Materials

Supplementary Table 1. Exploratory Comparisons of Menstrual Care Difficulties by Neurodevelopmental Characteristics (n=41)

	ID only (N=27) n (%)	ID + ASD (N=14) n (%)	Fisher's exact p
Difficulty handling menstrual products	12 (44.4)	6 (42.9)	1.000
Difficulty determining timing of changes	14 (51.9)	9 (64.3)	0.520
Difficulty changing products outside home/school	7 (25.9)	5 (35.7)	0.719
Refusal to use menstrual products	6 (22.2)	2 (14.3)	0.692
Indifference to menstrual blood	13 (48.1)	4 (28.6)	0.321
Panic or distress when seeing menstrual blood	1 (3.7)	0 (0.0)	1.000
Irritability affecting usual activities	5 (18.5)	6 (42.9)	0.140
Fatigue affecting usual activities	1 (3.7)	4 (28.6)	0.039

Note. ID = intellectual disability; ASD = autism spectrum disorder. The ID + ASD group included respondents with intellectual disability and autism spectrum characteristics, including those with additional ADHD characteristics. These analyses were exploratory and were not adjusted for multiple comparisons.

Supplementary Table 2. Exploratory Comparisons of Menstrual Care and Daily-Life Difficulties by Satisfaction with the Main Menstrual Product (n=46)

	Low-to-moderate satisfaction (n =24) n (%)	High satisfaction (n=22) n (%)	Fisher's exact p
Difficulty handling menstrual products	12 (50.0)	9 (40.9)	0.568
Refusal to use menstrual products	5 (20.8)	3 (13.6)	0.702
Difficulty determining timing of changes	12 (50.0)	13 (59.1)	0.568
Difficulty changing products outside home/school	7 (29.2)	6 (27.3)	1.000
Indifference to menstrual blood	11 (45.8)	8 (36.4)	0.562
Irritability affecting usual activities	12 (50.0)	3 (13.6)	0.012
Fatigue affecting usual activities	4 (16.7)	3 (13.6)	1.000

Note. Low-to-moderate satisfaction = satisfaction scores of 1 to 3; high satisfaction = satisfaction scores of 4 or 5. These analyses were exploratory and were not adjusted for multiple comparisons.