

Pediatric dentists' perspectives of children with special health care needs in Japan: developmental disabilities, phobia, maltreatment, and multidisciplinary collaboration

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24 **Abstract**

25 Background: The number of children diagnosed with developmental disabilities (DDs)
26 or other chronic difficulties has risen. However, each professional's awareness of
27 children with developmental, emotional and behavioural difficulties may differ,
28 allowing their special needs to be overlooked at child health checkups until secondary
29 difficulties appear. Therefore, it is necessary to explore the multi-professional views of
30 children with such chronic difficulties. This study investigates pediatric dentists'
31 perception of children with potential chronic difficulties.

32 Methods: Interviews were conducted with 21 pediatric dentists, and the transcripts were
33 analysed using grounded theory to develop categories for the theoretical assessment.

34 Results: Four themes emerged regarding the children with potential chronic difficulties:
35 children exhibiting possible DDs with awkward social communication and interaction;
36 severe rampant caries possibly derived from maltreatment; dental phobia possibly

37 derived from mental health problems; a complicated home environment where their
38 mothers exhibit poor oral health literacy.

39 Conclusions: This study's findings imply that participants' concept of children of
40 concern included the risks of poor oral health and mental health problems that other
41 healthcare professionals might overlook. It is recommended that multidisciplinary
42 professionals engaging in child health checkups be aware of children's oral and mental
43 health status as well as potential DDs and child maltreatment.

44

45 **Background**

46 Improving maternal and child health has been a global theme of community health care
47 systems [1]. In Japan, the national campaign promoting maternal and child health
48 launched in 2001 [2]. Since the secondary phase of this campaign, it decided on two
49 prioritised agendas: 1) support tailored to parents who have difficulties raising their
50 children; 2) prevention of child abuse from pregnancy [2]. Both difficulties with raising
51 children and child abuse are likely to be derived from the mixture of child, parent, and
52 sociocultural, environmental factors. Among various factors, children with
53 developmental disabilities (DDs) and their parents' stress were considered [3,4]. A
54 systematic review and meta-analysis revealed that parenting stress levels were higher

55 for parents of children with ASD/DD than parents of children from other clinical groups
56 [5]. A meta-analysis also found that parenting stress was a significant risk factor for
57 child abuse and neglect [6]. Therefore, it is essential to detect children with the
58 possibilities of developmental difficulties or child maltreatment in the early stage and
59 provide care to those children and their parents.

60 However, the rate of children with supposed developmental difficulties was
61 considerably different among the municipalities. An annual report indicated the rate of
62 children with abnormalities differed with a range of less than 5 % to more than 60% in
63 the Tokyo area [7]. Therefore, it is essential to promote equalising skills of
64 multidisciplinary professionals who engage in legitimate child health checkups to
65 prevent overlooking children's developmental risks [3].

66 The term *kininaru-kodomo* (children of concern) has been widely utilised in Japan to
67 refer to children regarding whom professionals are concerned about the possibility of
68 mild developmental disorders (DDs); child maltreatment; and other behavioural,
69 emotional, or social problems without any diagnosis or official record of individual or
70 environmental problems [10]. This term is practical because multidisciplinary
71 professionals share their concerns about children and parents even before their concerns
72 were determined as a diagnosis or legal child protection [11].

73 However, previous studies have mainly explored the perception of children of concern
74 among public health nurses and daycare centre teachers [10-12]. According to the type
75 of licenses and the following experiences, inter-professionals tended to have specific
76 viewpoints on children's risk factors and rights so that the philosophies of care
77 coordination are sometimes not unanimous [8,9]. Among three legitimate healthcare
78 professionals engaging in the legitimate child health checkups in Japan, it was reported
79 that public health nurses tended to mind the signs of child abuse and neglect, while
80 doctors mainly watched out the health overall [3]. Nevertheless, it has not been explored
81 how pediatric dentists perceive children's possible health risks, although they are one of
82 the three legitimate healthcare professionals at legitimate child health checkups.

83 According to a national survey which collected school teachers' report, 6.5% of
84 standard class students in Japan are considered as having mild DDs, that is, autism
85 spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), and learning
86 disorder (LD) [13]. According to the number of children with possible DDs, 13.3% of
87 3-year-old preschoolers were considered to have difficulties derived from DDs,
88 according to preschool teachers' report [12]. Moreover, in Japan, 122,575 cases of child
89 abuse were reported in 2016, increasing from 56,384 in 2010 [14]. Beyond Japan,
90 globally, children with DDs consists of a significant minority [15]. In the United States,

91 the Centers for Disease Control and Prevention admitted that approximately one in six
92 children aged 3–17 years had one or more developmental or behavioural disabilities
93 [16]. In the United States alone, nearly 1,000,000 children are victims of nonaccidental
94 trauma annually [17]. Therefore, it is urgent to adequately screen children with possible
95 health risks by clarifying each professional’s perspectives engaging in child health care.
96 However, dentists’ perception of children of concern has been little studied. Oral health
97 probably reflects the existence of children’s DDs and the parents’ parenting attitudes. A
98 previous study in India showed that oral healthcare needs remained unmet, although the
99 prevalence of dental caries was high among children with special health care needs
100 (CSHCN) [18]. Moreover, mothers at dental clinics do not dare hide their children’s
101 disabilities and their maltreatment [19-20]. Furthermore, considering the professional’s
102 responsibility for child abuse prevention [21], there is an urgent need to explore what
103 aspects pediatric dentists felt alerted. Therefore, this study aims to elucidate the
104 pediatric dentists’ perceptions of children of concern.

105

106 **Methods**

107 Qualitative research is suitable to explore the phenomenon that involves interactions
108 among people in the research field [22]. Among qualitative study designs, the grounded

109 theory approach was selected over other designs because it enables concept
110 development through constant data comparison. According to the grounded theory
111 approach, the theory is distinguished from the description and is also an arrangement of
112 systematically interrelated concepts, thereby explaining the phenomenon. This research
113 also intended to clarify the relationships among concepts. The data were collected
114 through individual interviews that were audiotaped, with an average of 29 min, and
115 transcribed. Observations were recorded in field notes.

116 After receiving the Human Research Ethics Committee's approval, the second author
117 recruited potential participants at a pediatric dentistry outpatient clinic in a university
118 hospital. This university hospital is located in A district of B city with a population of
119 3.7 million, which is the largest among cities in Japan. A district is closest to Tokyo and
120 where the number of Okinawan and Brazilian residents is relatively high. Twenty-one
121 dentists with 2-32 years of occupational experience were included to collect various
122 viewpoints. Table 1 shows the demographic characteristics of the participants. In
123 addition to working at the studied clinic, participants had also worked as part-time
124 workers at private dental clinics and public healthcare centres.

125 Potential participants received a query letter which requested a response from those
126 interested in being interviewed. The query letter included a brief description of the study

Table 1. Demographic characteristics of the participants (N = 21)

Characteristics	Number
Gender	
Female	14
Male	7
Age	
20s	6
30s	10
40s	2
50s	3
Years of current job experience	
1 year–4 years	7
5 years–9 years	5
10 years–14 years	4
15 years–19 years	2
30 years and above	3

127

128 and asked for participation based on their willful decision. Purposeful sampling is one

129 of the major principles of this methodology [23] to maximise the opportunity to develop

130 new concepts and interrelate existing concepts. The next interviewee was recruited

131 based on developed concepts, while constant comparisons among concepts were made

132 during the intertwined phases of data collection and analysis [22]. After a discussion

133 among authors, the second and third author recommended the next interviewee based on

134 a list of potential participants. All the participants were offered a gift card.

135 A semi-structured interview was used to explore the perception of children of concern

136 from an insider's perspective. The interview questions included the following: (a) what

137 is the definition of children of concern? (b) how are mothers of children of concern? (c)
138 what are the difficulties in dealing with children of concern? (d) what are the strategies
139 of health promotion of children of concern? Although these questions were guided in a
140 semi-structured interview protocol, the questions were increasingly focused and detailed
141 in subsequent interviews. Interviews were conducted in a private room located on
142 another floor from the studied clinic from May 2015 to August 2016. The principal
143 researcher also conducted fieldwork from January 2015 to October 2018, at the studied
144 clinic and the maternal and child living support facility, observing the participants'
145 interactions with the patients and mothers.

146 The analysis employed in the grounded theory approach involves open, axial, and
147 selective coding to develop analytic categories. Open coding divides data into
148 meaningful parts (codes) to make categories so that similar codes are gathered and
149 compared continuously to develop more abstract concepts. Axial coding is utilised to
150 interrelate categories to maximise the potential of developing theories. Selective coding
151 is used to develop core categories that integrate whole categories and provide cohesive
152 explanations of phenomena. Using computer software for qualitative data analysis
153 enables more transparent, rigorous qualitative analysis [24]. NVivo 11 was employed
154 during the process of developing categories. Moreover, the data were considered

155 saturated when no more codes could be identified, existing categories were coherent,
156 and enough variations to explain them. The second and third author critically reviewed
157 the analysis process and interpretation.

158 The present study followed the method that Guba and Lincoln [25] recommended
159 enhancing validity. One participant with over 30-year occupational experience checked
160 a summary of emergent themes and assured that the interpretation was accurate to their
161 perceptions. An expert in qualitative research also checked that the data and
162 interpretations were coherent and audited the study process. Additionally, the principal
163 researcher had known many participants and has cooperated in providing health
164 education to children and mothers who reside in a shelter. Moreover, maximising the
165 length of job experience assured that the data variations are the rationale for
166 triangulation.

167 Research approval was obtained from the Tsurumi University Research Ethics
168 Committee (Approval no: 1303, 9 May 2015; 1511, 20 July 2017). All the participants
169 were informed of the study's objective and design, and written consent was obtained
170 from the participants for interviews. They were also free to leave the interview if they
171 wished.

172

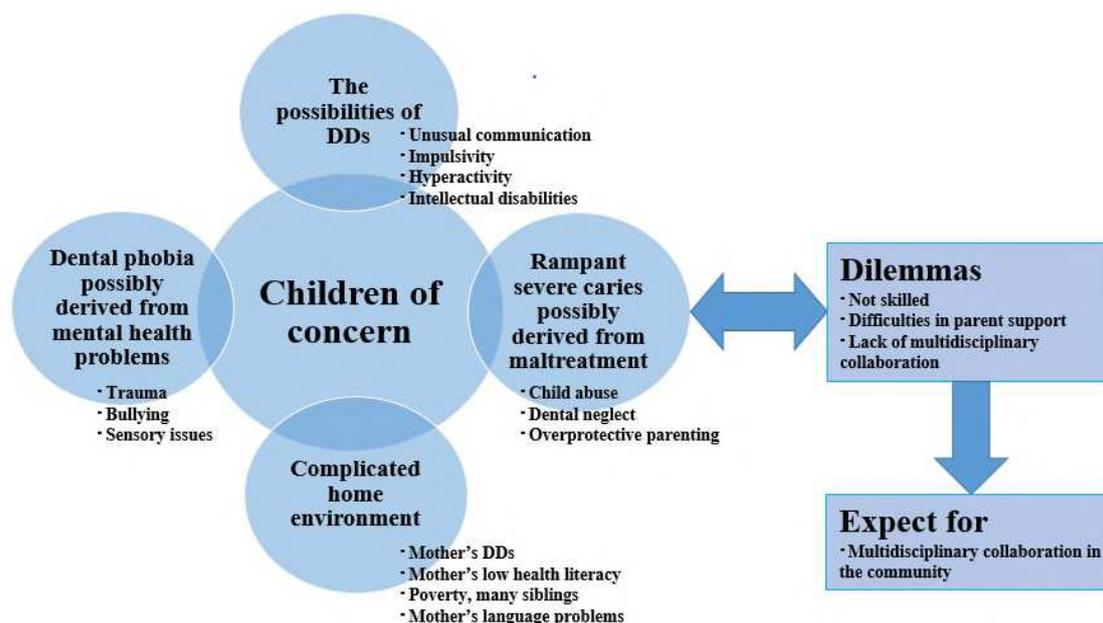
173 **Results**

Fig. 1 Core categories and categories of participants' perception of children of concern

174 The data analysis revealed a conceptualisation of how pediatric dentists perceive
 175 children of concern, paying attention to children's health status and well-being, with
 176 four core categories, DDs, dental phobia, rampant caries derived from child
 177 maltreatment, and complicated family environment (see Fig. 1). Regarding DDs,
 178 possible ASD, mentally retarded, and impulsive and hyperactive behaviours were the
 179 topics participants said they cared about. Due to behavioural difficulties during
 180 treatment, participants felt that the treatment of children of concern was complex.
 181 Moreover, they had dilemmas in explaining to children's parents the possibilities of
 182 DDs. Therefore, they expected the multidisciplinary team to discuss and care for
 183 children of concern. Participants mentioned the possibilities of dental phobia, trauma

184 influences, and sensory sensitivity regarding mental health problems. When they
185 suspected maltreatment, the signs of neglect, abusive behaviours, and overprotecting
186 parenting were the categories of the participants' concerns. The home environment,
187 such as mothers' low health literacy, rampant caries, and possible DDs, were concerned.
188 Participants considered that multidisciplinary team care was necessary to keep children
189 of concern and their family healthy as a whole.

190

191 *Dentists' perspectives of children of concern*

192 **Children with possible DDs**

193 The participants described that children of concern showed autistic-like traits, such as
194 echolalia, making less eye contact, and no response when their names were called. The
195 participants also affirmed that they felt cared about children when their conversation did
196 not proceed well, perplexingly saying, "We do not communicate well with each other,
197 but children keep talking by themselves. I wonder if they are talking because they are
198 afraid of something, or if they are also constantly talking at home." The possibility of a
199 mentally retarded was also taken into consideration. Participants said that they assessed
200 both probabilities of the comorbidity of ASD and the sole intellectual disability when
201 they found communication with children awkward.

202 Moreover, a participant explained her puzzlement when she met a child who exhibited
203 unusual impulsivity and hyperactivity. Participants admitted that they cared for the
204 possibilities of DDs when children showed unusually impulsive behaviours such as
205 hiding in a trash box that looked tight for the children's body. Behaviour problems such
206 as shout, escape, kicking, beating, and excessive crying, were reported as the
207 participants' concerns. Participants stated their doubt of children's having ASD when
208 children exhibited unusual behaviours compared with typically developed children.
209 Although a few participants told children's supposed ADHD, most participants said
210 they were more concerned about children's supposed ASD. Also, participants
211 mentioned that children of concern kept walking around without communication, and
212 they could not hold the children if they did not use a restrainer.

213 When I call the patient to come in, other children come to me, greet me as
214 customary, and can reply with, "Yes." However, children with concerns never
215 come in such a natural way. As soon as I notice such children have come, they
216 immediately disappear.

217 Junior dentists in their 20s and 30s admitted that treating children with DDs or supposed
218 DDs was difficult. They said that they panicked and got heated up when such children
219 could not obey their instructions, and therefore, the treatment would take time. In

220 addition to the difficulties in treating children, participants mentioned the difficulties in
221 explaining parents. Although they sensed the possibilities of DDs in children of concern,
222 they recognised that they did not have the authority to tell their concerns to the
223 children's parents. However, they contemplated that children of concern should be
224 linked to developmental rehabilitation early. Therefore, they were keen on children who
225 had not been diagnosed, although the children were suspected of having DDs. On the
226 other hand, participants said that they were not much concerned about the children with
227 the diagnosis, as long as their parents accepted the diagnosis and adequately cared for
228 them.

229 Participants admitted that they could not verify the reliability of their concern of
230 children's possible DDs unless parents share information with participants. Therefore,
231 they regarded multidisciplinary collaboration as necessary. They expected a community
232 healthcare system to exchange opinions with the centre for developmental disorders,
233 community nurses, care workers, and daycare teachers.

234 Children with possible DDs often go to the centre for developmental disorders.

235 However, I guess that most mothers think it has nothing to do with dentists. I
236 hope professionals can share such information more easily.

237

238 **Children with dental phobia possibly derived from mental health problems**

239 Not a few participants stated that they were concerned for children who showed
240 potential for dental phobia. According to participants, dental phobia accompanied strong
241 rejection of dental treatment, vomiting, and fainting. A participant said, “Recently, I
242 have noticed children who even show vomiting reflex. So to speak, I occasionally see
243 children who may have dental phobia.” Participants interpreted that dental phobia might
244 be derived from the trauma that children of concern experienced unpleasant dental
245 treatment previously.

246 Concerning trauma, a participant mentioned that he cared for a patient who cried for
247 hours, saying “When the patient went to elementary school, they had unknown mental
248 health problems.” The participant above hypothesised that the patient became
249 withdrawn after bullying at an elementary school.

250 Moreover, another participant paid attention to sensory problems to explore the cause of
251 excessive crying among children of concern.

252 As you know, some children are so sensitive that they dislike being touched
253 the inside of their mouth.

254

255 **Children with severe rampant caries possibly derived from maltreatment**

256 The participants were very wary of children with severe rampant caries. For example,
257 there were not a few severe cases who lost almost all child teeth decayed from the root.
258 Participants considered the children's rampant severe caries unusual, and therefore they
259 became concerned about the children. In their perception, children's rampant severe
260 caries and frequent recurrence of those interrelate the possibilities of their parents'
261 abuse or neglect.

262 The condition of the cavity is not normal. When that happens, I wonder what I
263 should do as the child is not being cared for by their parents.

264 The participants mentioned that they were concerned about the children with possible
265 child abuse, for example, when a young child had a bruise on his or her eyes. A
266 participant said that everyone at the studied clinic was shocked to see a mother yell at
267 her boy and did not give his slacks and even threw it opposite him. Although
268 participants cared for the possible abuse or neglect, they were circumspect of calling the
269 child consultation centre for child protection.

270 Not a few participants mentioned the possibilities of neglect by their mothers: physical
271 neglect, emotional neglect, and dental neglect. As for physical neglect, participants
272 minded unsanitary conditions in that a mother did not change a diaper timely so that a
273 child developed diaper rash. They also mentioned concern for children who exhibited an

274 unbalanced diet, such as a 3-year-old patient who prepared his or her meal
275 independently and, in fact, drank cola only for breakfast. In a participant's remark,
276 another 3-4-year-old patient said he or she ate a steak for breakfast, which was an
277 unusual breakfast menu in the Japanese context. Therefore, a participant interpreted that
278 this patient had not eaten anything for breakfast. Moreover, the dirtiness of faces, smell,
279 and clothes' conditions were the objects that participants watched out for.

280 Concerning the possibilities of neglect, participants noticed some mothers seemed little
281 interested in their children's achievements. For instance, some mothers were considered
282 less responsive, showing no joy when participants praised the children for their
283 perseverance during dental treatment. Not a few participants noticed mothers'
284 indifference to their child potentially led to dental neglect. Participants listened to
285 mothers with doubt because mothers asserted that their children said nothing about their
286 cavity pain. A participant was appalled at the mother's excuse of refusing the follow-up
287 appointment for treating her children's rampant severe caries, saying that the mother
288 argued that she was too busy to bring her child to the treatment and check children's
289 toothbrushing at home. Actually, the mother had enough time to eagerly come to an
290 aesthetic dental clinic for whitening her teeth.

291 The patient's mother had come to the aesthetic dentist...Even though that

292 mother was very motivated about her teeth, many problems in her child's
293 mouth would really surprise you.

294 Overprotecting parenting attitudes was also the factor that participants cared for related
295 to poor dental health among children of concern. Participants said that overprotective
296 mothers were hesitant to leave their children's side, despite the clinic's mother-child
297 separation policy for treatment. Participants noticed that some mothers permitted
298 everything that their children demanded. They stated that such mothers did not clean
299 their children's teeth because they did not like toothbrushing. As a result, they said,
300 children of concern often failed in developing healthy adult teeth.

301

302 **Children with a complicated home environment**

303 Participants considered that mothers' home care was essential to maintain oral health
304 among children of concern. However, they felt that they could not expect the children's
305 mothers with adequate care because such mothers mostly had disabilities, such as
306 autism, intellectual disability, and depression. Participants said that there were mothers
307 whose attitudes and communication was considered unconventional. Participants
308 watched out mothers who looked little care for others' responses—furthermore,
309 participants suspected mothers' DDs through a conversation.

310 I don't know for sure, the mother herself has some problems, so-called autism
311 because I can't make myself understood when I talk to her.

312 Participants beware of some mothers' poor dental health literacy in that they believed
313 that caries of deciduous teeth was not a health threat because permanent teeth could
314 replace them. Moreover, a participant affirmed a mother who said that her children's
315 teeth melted since birth. Related to mothers' low oral health literacy, participants
316 considered that mothers with many children, complicated marital relationships, social
317 security, and foreign status often could not afford to care for their children's teeth
318 seriously. They noticed that such mothers also had severe rampant caries. Participants
319 said they had wished to do something for children of concern and their mothers,
320 although they knew they could not do anything except for children's dental treatment.
321 That is why they awaited that a multidisciplinary team would work to deliver care for
322 the family with heavy burdens.

323 There were community health nurses and care workers who visited the family
324 once a week and did oral care...because not only the child but also the mother
325 had problems. I was cheered up to hear that story because I knew that not all
326 community healthcare systems were useless.

327

328 **Discussion**

329 The reflections of 21 dentists were studied using grounded theory for accounting for the
330 individual and environmental factors of children of concern. Participants discussed
331 various views, such as children with potential DDs, dental caries possibly derived from
332 neglect, dental phobia possibly derived from trauma, and complicated sociocultural
333 background. This study results provide a firm ground for the early detection of children
334 with possible health risks. Previous studies have shown the ambiguity of the concept of
335 children of concern because this term emphasises the preventive detection of health
336 risks such as the likelihood of DDs and maltreatment [10-12, 26-28]. However, this
337 study presented more obvious children's conditions considered health risks-rampant
338 severe caries and dental phobia. Therefore, this study could provide some critical factors
339 that might discern children of concern.

340 Participants cared for the unusuality of children's communication and behaviours. They
341 suspected that unusuality were the symptoms of ASD. According to The Diagnostic and
342 Statistical Manual of Mental Disorders (DSM-5), persistent deficits in social
343 communication and social interaction across multiple contexts are factors in the
344 diagnostic criteria of ASD [29]. It is inferred that participants noticed the importance of
345 assessing the quality of social communication and interaction. Although public health

346 nurses watch social communication and interaction conditions at child health checkups,
347 they tend to care for mother-child interaction [11,30]. However, it is considered difficult
348 for professionals and parents to be aware of children's social communication and
349 interaction abnormality when a mother and child relationship was satisfactory [10,11].
350 Therefore, more than 60% of public health nurses answered that they could not
351 adequately screen children with DDs at 18-month health checkups, according to a
352 nationwide survey [27]. That is why this study's results contribute to multidisciplinary
353 professionals' knowledge and practice by vividly describing the social and behavioural
354 characteristics among children of concern.

355 As for impulsivity and hyperactivity, some participants considered those symptoms
356 stemmed from ASD, and other participants considered ADHD. Previous research
357 revealed that one group of children with diagnosed ASD and the other group of ADHD
358 had similar impulsivity and hyperactivity scores, although ASD group showed
359 significantly higher scores in social communication deficits and repetitive behaviours
360 [31]. Participants' remarks based on clinical experiences might prove current research
361 trends on ASD and ADHD's comorbidity. Also, this study results shed a new light on
362 the concept of children of concern in that the possibility of ASD has been primarily paid
363 attention [10]. Future research is considered necessary to thoroughly explore

364 professionals' perceptions of hyperactivity and impulsivity among children of concern
365 to obtain clues to understand the similarities and differences between ASD and ADHD.
366 Moreover, this study implied that children of concern are the subject of mental
367 healthcare. Previous studies regarding the perspectives of children of concern among
368 public health nurses and daycare centre teachers have not revealed the possibility of
369 mental health problems other than DDs [10,11]. A project of providing health checkups
370 at 5-years of age only found that 56 children (5.4%) were diagnosed with DDs and six
371 children were diagnosed with maltreatment during the 8-years study period [28].
372 However, mental health problems among children and adolescents have a significant
373 influence on their health indicators. The suicide rate under 20 years old is consecutively
374 high in 30 years, and this has been a social concern in Japan [32]. A review suggested
375 that dental phobia including dental anxiety and dental fear was associated with other
376 psychiatric disorders and symptoms and patients with a high level of dental anxiety
377 were more prone to have a high level of comorbid mental health problems [33].
378 Therefore, this study results illuminated the importance of dental phobia as a marker of
379 mental health problems that were hardly detected in Japan's currently designed child
380 health checkup systems.
381 This study could present advanced factors of severe rampant caries and dental neglect

382 for the relationship between children of concern and maltreatment. According to a
383 survey carried out by the Japanese Society for Oral Health, dental caries was
384 significantly more prevalent in children at child consultation centres [34]. Therefore,
385 our findings are in line with past research that suggests a relationship between
386 maltreated children and dental caries. As for neglect, a systematic review indicated it
387 has to be distinguished from poverty circumstances [35]. Our findings also supported
388 the report above. There were children with severe caries due to their mothers'
389 negligence of children's oral health needs, even though they lived in a luxury residential
390 area. In a review of dental neglect [35], socioeconomic factors have been little studied.
391 This review pointed out that the difficulties of dealing with poverty as a potential factor
392 of neglect because the cost of child health care is free or reimbursed in Western Europe
393 [35]. In Japan, child dental care costs are also mostly free or reimbursed, depending on
394 the municipalities' system and the parent's economic status. Therefore, this study
395 highlights the need further to investigate the influence of socioeconomic factors on
396 dental neglect.

397 Previous studies indicated that maternal factors are indispensable in detecting children
398 of concern [10-11,26]. Our findings are basically in line with previous studies in that
399 mothers' psychiatric disabilities, and parenting difficulties were pointed out. However,

400 in our analysis, we identified that mothers' low health literacy was one of the factors
401 that participants define their children of concern. A survey using the European Health
402 Literacy Survey Questionnaire revealed that health literacy in the Japanese population
403 was in general lower than in Europe [36]. Maternal lower health literacy is likely to
404 relate to more flawed service use, management and outcomes of children with chronic
405 conditions [37]. Our findings suggested that mothers of children of concern had poor
406 oral health literacy about children and themselves. Although the national campaign in
407 Japan aimed to increase parents' knowledge of children's social communication and
408 interaction [2], little research has targeted the mother's oral health literacy. Therefore,
409 this study implied that more opportunities should be provided for mothers and
410 professionals to check mothers' oral health literacy to enhance child health outcomes.
411 Moreover, dentists in their 20s claimed their anxieties in treating children of concern
412 and informing their mothers of possible developmental difficulties and dental health
413 management necessities. Our findings are in line with previous studies in that public
414 health nurses in their 20s were less confident in their potential of screening for infants
415 with DDs at child health checkups [27]. A previous interview study with public health
416 nurses suggested that providing care for children with ASD and their parents was
417 tailored to parents' acceptance; therefore, mentoring junior public health nurses and

418 passing experience-based knowledge were necessary [38]. Dentists also have difficulties
419 in treating children with ASD and dentists considered flexibility and multidisciplinary
420 network were the keys to success [20]. Moreover, a review of dental neglect revealed
421 that detecting the risk was challenging and led to the reluctance of reporting cases [35].
422 Hence, support and research are necessary for professionals to share knowledge and
423 skills and mentor junior professionals to improve the quality of care for children with
424 chronic health risk factors.

425 Our findings suggested that participants expected multidisciplinary collaboration for
426 professionals and parents to understand and manage the health status of children of
427 concern adequately. As with CSHCN [9], the needs of children of concern are so holistic
428 and diverse that the multidisciplinary team approach was necessary. A project to screen
429 children's developmental, behaviour problems and improve the school refusal rate
430 included stakeholders: public health nurses; daycare centre teachers; paediatricians;
431 psychologists; school doctors; school teachers and special education teachers [28].
432 However, previous research indicated that the professionals' awareness of
433 multidisciplinary collaboration was not always positive [39]. Because public health
434 nurses in Japan tended to pay more attention to child abuse cases, collaboration effort
435 for the support of children with DDs became less in small and middle-sized

436 municipalities [3, 27, 39]. This research indicated that future research was necessary to
437 explore each professional's perception of collaboration to design more effective
438 collaboration system.

439 **Limitations of the study**

440 Although this study contributes to the knowledge base on pediatric dental providers
441 who treat children and mothers of concern, it has some limitations. The small study
442 sample limits the transferability or applicability of its outcomes. Qualitative and
443 quantitative research that samples more extensive and more diverse pediatric dentists to
444 determine this study's external validity is paramount. It is crucial for future research to
445 expand to include other healthcare providers other than dental providers. Furthermore,
446 the study sample is so homogeneous that it is not sufficient to conclude that the results
447 can be applicable to another practice site. Comparing the perceptions of children of
448 concern from diverse communities will be indispensable in developing nationwide,
449 culturally responsive practices for children and mothers. Another limitation is researcher
450 bias. The research team worked to address these biases by forming a multidisciplinary
451 team, consulting with a supervisor, and member checking.

452

453 **Conclusion**

454 This study contributes to knowledge about children with probable ASD, dental phobia,
455 maltreatment, and challenging home environment. Moreover, our findings added to the
456 knowledge about mothers with possible problems in parenting and their health. Our
457 participants' narratives provide insight and awareness to an understudied population to
458 guide further research and practice in working with clients affected by possible health
459 risk factors. The 21 pediatric dentists represented in this study help the reader better
460 understand how they screen children, with a particular sensitivity to the developmental,
461 emotional, behavioural difficulties and poor dental health.

462

463 **List of abbreviations**

464 DD: Developmental disability

465 ASD: Autism spectrum disorder

466 ADHD: Attention deficit hyperactivity disorder

467 CSHCN: Children with special health care needs

468 DSM: Diagnostic and Statistical Manual of Mental Disorders

469

470 **Declarations**

471 *Ethics approval and consent to participate*

472 Ethics approval was granted by the Human Research Ethics Committee at Tsurumi
473 University (application numbers 1303 and 1511). Informed consent was obtained from
474 all participants. All methods were performed in accordance with the ethical principles
475 for research including human subjects outlined in the Declaration of Helsinki.

476

477 ***Consent for publication***

478 Not applicable.

479

480 ***Availability of data and materials***

481 The data used and/or analysed during the current study are available from the
482 corresponding author on reasonable request.

483

484 ***Competing interests***

485 The authors declare that they have no conflict of interest.

486

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492

493 **Author's Contributions**

494 AO, HF, and YA designed the study, and AO undertook the qualitative data collection
495 and analysis and drafted the manuscript. AO, HF, and YA participated in the
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498

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504

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Figures

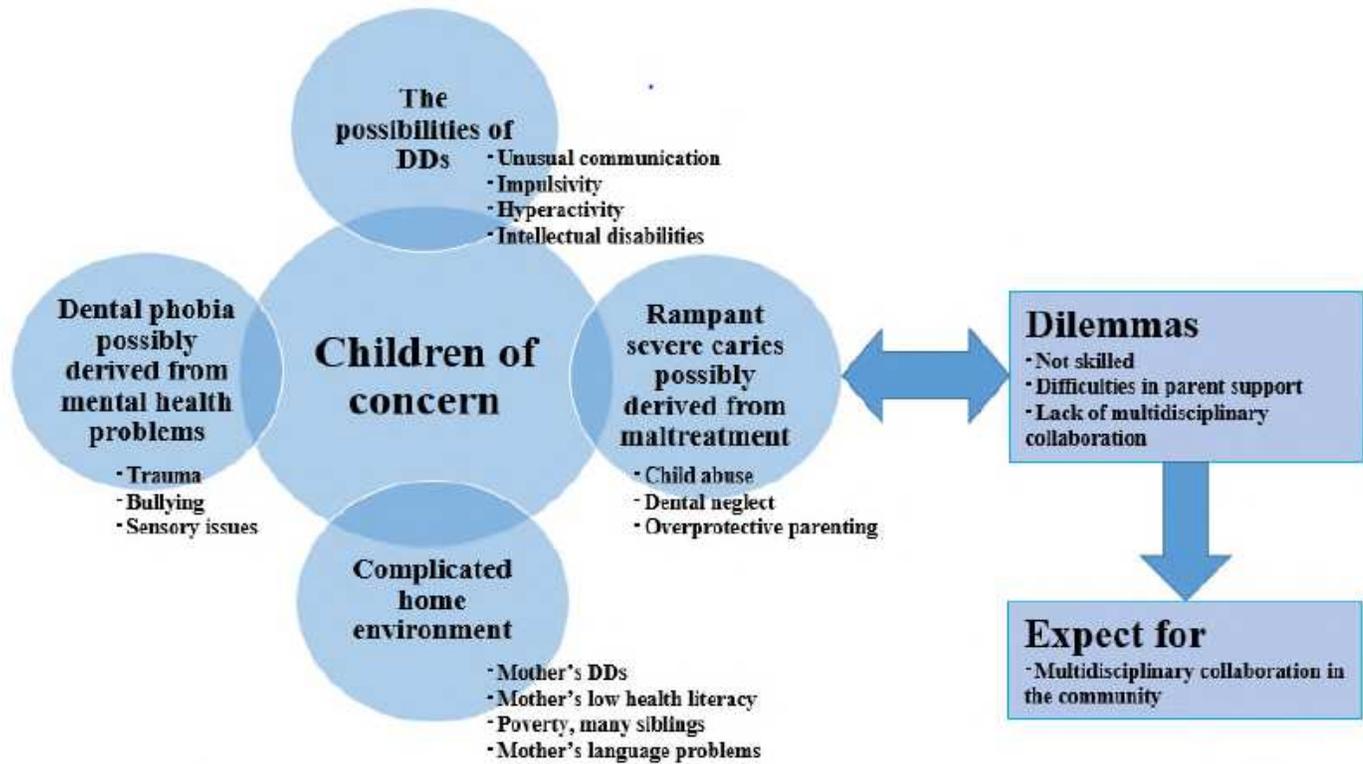


Figure 1

Core categories and categories of participants' perception of children of concern