Article

JCHC

Journal of Child Health Care
1–12

DOI: 10.1177/1367493511426280
chc.sagepub.com
SAGE

Determinants of parental satisfaction with ultrasound hip screening in child health care

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Abstract

Prior research has shown ultrasound (US) screening for developmental dysplasia of the hip (DDH) in preventive child health care to be more effective than the current screening method. In the present study, 3-month-old infants were screened for DDH with US. The objective of this study was to examine parental satisfaction with the screening and determinants that affect satisfaction. Parental satisfaction was measured using a questionnaire. Independent variables included socio-demographic determinants, structure, process and outcome-related determinants and the meeting of expectations. Satisfaction with the screening was high. Parents who perceived the screener as competent, had enough time to ask questions, perceived the proceeding as fluent, perceived a low burden on their infant and whose expectations were met, were more likely to be satisfied. Satisfaction was influenced by process-related factors and not by factors related to the structure and the outcome of the screening. Good information provision before the screening and communication during the screening are means by which parental satisfaction can be influenced positively.

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Keywords
child health, developmental care, evaluation, health services, parents, research

Introduction

Routine examination of all children is standard practice in preventive child health care (CHC). In the Netherlands, every infant is scheduled, for preventive reasons, to visit the CHC center eight times during their first year of life. The acceptance of this surveillance is proven by the high participation rate of 95 percent in the first year of life (Verbrugge, 1990; Verloove-Vanhorick and Reijneveld, 2007). One of the standard examinations performed in the newborn's first few months is the screening for developmental dysplasia of the hip (DDH), which entails a physical examination and identification of risk factors (e.g. breech position in the last period of pregnancy and/or at birth and a positive DDH family history). An alternative for the physical examination for DDH is ultrasound (US) screening. This is a widely accepted screening method in German-speaking countries (Dorn and Neumann, 2005). Previous research in the Netherlands showed that US screening detects more infants with DDH and detects them at an earlier age compared to the current practice (Roovers et al., 2005). As well as the effects of DDH screening on clinical outcomes, it is also important to assess less tangible outcomes, such as parental satisfaction with the screening (Hall, 1999).

Patient satisfaction is an important validator for the quality of health care delivery (Donabedian, 1966, 1992). In preventive CHC, the focus on the assessment of the quality of the provided care is essential to improve the functioning of the health care system and it is needed to maintain optimal care as well as to avoid adverse outcomes (Mangione-Smith and McGlynn, 1998). Patient satisfaction is, in turn, considered to be an important predictor of health-related behavior, by, for example, influencing patients' commitment to, and effectiveness of recommended treatment (Donabedian, 1992; Pascoe, 1983).

Butt et al. (2009) provided a conceptual model to measure parental satisfaction with quality of care. The essence of this model is based on Donabedian's (1997) categorization of measures of health care quality: structure, process and outcome. Structure encompasses the attributes of the setting, such as accessibility and waiting time. The process denotes what is being done during the provision and receipt of health care, and includes measures like interpersonal communication between the health care provider and the patient and the continuity of the health care provider. The last factor is the outcome, which can be defined as the impact of the provided care on the parents' emotions and knowledge. It also includes the effects of the provided care on the health status of the patient.

Another determinant often associated with a person's satisfaction with health care is their expectations prior to the health care encounter (Donabedian, 1992; Linder-Pelz, 1982a, 1982b; Staniszewska and Ahmed, 1999). Discrepancy between the patients' expectations and the occurrences during the health care encounter correlates negatively with patient satisfaction (Linder-Pelz, 1982a). This has two practical outcomes. First, it implies that, with regard to health services research, knowledge about patients' expectations can predict their evaluation of the health care encounter. Second, health care providers can ensure patient satisfaction by provoking positive expectations and subsequently provide a favorable health care encounter (Linder-Pelz, 1982a).

Based on the positive outcomes of US screening compared to the current screening method, a follow-up study was set up to examine the feasibility in daily practice and the cost-effectiveness

associated with the introduction of US screening for DDH in CHC centers in the Netherlands. In this follow-up study, 5521 parents were invited when their newborns were 3 months old, to participate in the US screening during an extra visit to the CHC center.

Since US screening for DDH is an innovation in CHC in the Netherlands, it was unclear whether the invited parents would accept the screening and be satisfied with the delivered care. The aim of the current study was therefore to assess parental satisfaction with new type of hip screening (with US) and to gain an insight into the factors that influence satisfaction. Insight into key factors that determine parental satisfaction with the screening makes it possible to optimize the provision of the screening to parents, which in turn might lead to higher participation rates, increased compliance with the instructions of the US screener and a higher adherence to the advice on additional diagnostics once DDH is suspected.

Methods

Between November 2007 and April 2009, 4099 infants aged 3 months were screened for DDH during a special visit to the CHC center. The US screening for DDH was organized by two CHC organizations, one of which was situated in a rural area (organization A) and the other in an urbanized area (organization B) in the Netherlands. The examinations were performed by CHC physicians, CHC nurses and radiographic technicians who were all trained in hip sonography. All infants with suspected DDH, based on the screening, were referred to the medical specialist for additional diagnostic procedures and, if necessary, treatment.

Participants and procedure

Participants in the current study were parents of infants who visited the US screening in organization A or B. The questionnaire was given to the parents in two different time frames (in May and June 2008 and in November and December 2008) by both organizations. Handing out the questionnaires in different months allowed for a correction of variations during the year. A total of 1140 parents in both time frames together participated in the screening and received the questionnaire, of which 622 parents (54.6%) visited organization A and 518 parents (45.4%) organization B.

The screener handed out the questionnaire to the parents after the US screening and briefly explained the objective of the questionnaire. A letter was included with information about the questionnaire together with a reply-paid envelope. A reminder was sent after two weeks to help increase the response.

Satisfaction measures

A questionnaire developed by the researchers was used to measure parental satisfaction with the screening. Measures taken to predict satisfaction were based on the three determinants in the conceptual models by Donabedian (1997) and Butt et al. (2009) and on the assumption that expectations are related to satisfaction.

Background variables. The following socio-demographic variables were collected from the parents: age, educational level (low, middle and high), country of birth of the father and the mother and the language spoken at home. In addition, the organization in which the screening was performed was

used as a predictor of satisfaction, since procedures may have differed between the organizations (0 = organization A/ rural area, 1 = organization B/ urban area).

Parental satisfaction. Overall parental satisfaction was measured on a 10-point scale ranging from 1 'bad' to 10 'excellent' using the following item: 'Can you indicate your evaluation of the screening?' Providing an evaluation score on a 10-point scale is a commonly used and accepted method in the Netherlands.

Structure. The concept of structure was measured by asking parents to evaluate their traveling and waiting time on a 5-point scale ranging from 1 'very long' to 5 'very short'.

Process. The screening process was measured with seven items. First, parents evaluated the screener on competence (1 'very incompetent' to 5 'very competent'), friendliness (1 'very unfriendly' to 5 'very friendly') and carefulness (1 'not careful' to 5 'very careful'). Second, the interpersonal communication with the screener was assessed with the following item: 'There was enough time to ask questions during the consultation' (1 'totally disagree' to 5 'totally agree'). Third, parents could respond to the following items: 'The screening proceeded very fluently' and 'The burden of the screening on my infant was very high' on a 5-point scale ranging from 1 'totally disagree' to 5 'totally agree'. The scores of the last item were reversed, with a high score implying a low screening burden and a low score indicating a high burden. The last item measured the crying of the infant and the extent to which parents perceived this as unpleasant. Parents recorded whether their infant cried during the screening and, if so, they scored on a 5-point scale their perception of the unpleasantness of the crying (1 'not unpleasant' to 5 'very unpleasant'). A dichotomous score was then created based on a positive and negative experience of the (not) crying of the infant. A positive experience by the parents was described as the infant not crying or they perceived the crying as not unpleasant. If the infant's crying was perceived to be unpleasant, it was considered to be a negative experience. This item was scored 0 'not crying or crying but not unpleasant' and 1 'crying and unpleasant'.

Outcome. We asked parents to provide a description of their feelings of fright, concern and insecurity after the screening. All these items were measured on a 5-point scale (1 'very frightened' to 5 'not frightened', 1 'very concerned' to 5 'not concerned' and 1 'very insecure' to 5 'very secure'). Another outcome measured in this study was a possible referral of the infant to the medical specialist if DDH was suspected. This variable was scored 0 'no referral' and 1 'referral'.

Meeting of expectations. The agreement between expectations and the occurrence of these expectations was retrospectively assessed with the following question: 'The ultrasound screening met my expectations completely.' This item was measured on a 5-point scale ranging from 1 'totally disagree' to 5 'totally agree'.

Data analyses

Means, standard deviations and frequencies were determined for all variables. After this, Spearman's rank correlation coefficients between the predictor variables and the score on overall parental satisfaction were calculated. Finally, a univariate analysis of variance (ANCOVA) was performed to examine the relationship between the independent variables and parental satisfaction.

Results

Participants

A total of 703 questionnaires were returned (response 61.7%). In organization A, 427 questionnaires were sent back (response 68.6%) and 276 in organization B (response 53.3%). Mothers filled out most of the questionnaires (84.3%), fathers completed 7.7 percent and 7.4 percent questionnaires were completed by both parents together.

The average age of the fathers was 34.30 ($SD = 5.13$) and of the mothers 31.53 ($SD = 4.38$). Of the fathers, 25.9 percent had received a lower education, 33.4 percent had a middle education and 40.7 percent were highly educated. Of the mothers, this was 20.1 percent, 34.6 percent and 45.2 percent respectively. The parents mainly originated from the Netherlands (93.2% of the fathers and 93.3% of the mothers) and spoke Dutch at home (96.2%). Since these measures of ethnicity were very homogenous, they were not included in the analyses.

Descriptive statistics and correlations for predictor variables and parental satisfaction

The descriptive statistics of the determinants of satisfaction are presented in Table 1. Overall, parents reported positive scores on all factors. The average score on overall satisfaction was 8.08 ($SD = 1.05$), with 5.2 percent ($n = 36$) of the parents evaluating the screening with a 6 or lower, 17.7 percent ($n = 122$) with a 7, 48.2 percent ($n = 333$) with an 8, 19.1 percent ($n = 132$) with a 9 and 9.8 percent ($n = 68$) with a 10. Of the infants, 33.9 percent ($n = 234$) cried during the screening. Of this group, 31.6 percent ($n = 74$) of the parents found the infant's crying (very) unpleasant. A total of 142 infants (20.2%) were referred to the hospital because of suspected DDH.

In Table 2, Spearman's correlations between the factors are presented. Parental satisfaction was marginally related to the socio-demographic variables. Only the mothers' educational level correlated significantly with satisfaction, but it still showed a small effect. Medium to large positive relations were found between parental satisfaction and the competence, friendliness and carefulness of the screener, the proceeding of the screening, and the burden of the screening on the infant.

Univariate results

Table 3 presents the univariate findings for parental satisfaction. The three redefined categories (25% – 50% – 75%, see Table 1) were used for this analysis, since the distribution was skewed to the right for all predictor variables.

The competence of the screener influenced satisfaction significantly. Parents who perceived the screener as competent were more satisfied than parents who were neutral $t(586) = -3.28$, $p = .001$ or who found the screener incompetent $t(586) = -1.98$, $p = .05$.

Satisfaction was also significantly influenced by the time offered to parents to ask questions. Parents who felt they had been given enough time to ask questions were more satisfied compared to parents who were neutral $t(586) = -3.63$, $p < .001$, but not compared to parents who found that they did not have sufficient time $t(586) = -1.81$, $p = .07$.

Parental satisfaction was also associated with the proceeding of the screening. A perceived fluent proceeding resulted in more satisfaction than a non-fluent proceeding $t(586) = -2.27$, $p < .05$ or a screening which was evaluated as neutral $t(586) = -1.97$, $p = .05$.

In addition, satisfaction was influenced by the burden of the screening on the infant. Parents who found that the screening placed a low burden on their infant were more satisfied than parents

Table 1. Descriptive statistics for the predictor variables of overall parental satisfaction with the US screening for DDH

Measure	N	M	*SD*	25% [a]	50% [a]	75% [a]
Structure						
Evaluation of the traveling time	689	4.08	0.96	5.5	23.7	70.8
Evaluation of the waiting time	689	4.21	1.03	7.4	16.3	76.3
Process						
Screener competence	678	4.16	0.76	1.8	15.8	82.4
Screener friendliness	690	4.31	0.77	1.9	12.0	86.1
Screener carefulness	672	4.20	0.75	1.9	13.7	84.4
Enough time to ask questions	693	3.90	0.77	5.2	17.3	77.5
Proceeding of the screening	692	4.02	0.82	6.8	10.4	82.8
Burden of the screening	692	4.00	0.89	7.1	13.0	79.9
Outcome						
Feeling frightened after the screening	679	4.50	0.83	3.5	8.2	88.2
Feeling concerned after the screening	682	4.39	0.94	6.6	7.8	85.6
Feeling insecure after the screening	680	4.38	0.84	4.0	9.9	86.2
Meeting of expectations	690	3.62	0.74	6.7	31.7	61.6

[a] Measured on a 5-point scale (25% represents 1/2 on the scale, 50% represents 3 on the scale, 75% represents 4/5 on the scale).

who evaluated the burden on their infant as high $t(586) = -2.75$, $p < .05$, but not compared to parents who were neutral $t(586) = -0.36$, $p = .72$.

The unpleasantness of the crying of the infant proved to be a significant predictor of satisfaction. Parents whose child did not cry or who did not perceive the crying as unpleasant were more satisfied than parents who perceived the crying as unpleasant $t(586) = 2.00$, $p = .05$.

Finally, meeting the parents' expectations also influenced satisfaction. If the screening met the parents' expectations, they were more satisfied than if the screening did not meet their expectations $t(586) = -3.52$, $p < .001$ or if they were neutral $t(586) = -3.39$, $p = .001$.

The organization, the socio-demographic variables, the evaluation of traveling and waiting time, the friendliness and carefulness of the screener, feeling frightened, concerned and insecure after the screening and referral to the medical specialist were not predictors of parental satisfaction.

Discussion

Screening for DDH with US is an innovation in CHC in the Netherlands. Insight into parents' perceptions about the screening is very important because it gives the CHC professionals the opportunity to improve the care provided to infants. This study identified several determinants related to parental satisfaction and showed that parents were positive about different aspects of the screening. Parents also reported high levels of overall satisfaction with the screening. High parental satisfaction levels in CHC have also been found in other studies (Halfon et al., 2004; Hart et al., 2007; Korsch et al., 1968; Newacheck et al., 2001; Wolke et al., 2002).

Socio-demographic variables did not predict satisfaction of the parents in this study. This is in line with a meta-analysis by Hall and Dornan (1990), in which only minor correlations between socio-demographic variables and patient satisfaction were found. The participants in this study

Table 2. Spearman's rank bivariate correlations for relations between independent variables and overall parental satisfaction with the US screening for DDH

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Background variables																			
1. Organization																			
2. Age mother	.17**																		
3. Age father	.11**	.67**																	
4. Educational level mother	.42**	.20**	.14**																
5. Educational level father	.41**	.14**	.06	.58**															
Structure																			
6. Evaluation of the traveling time	−.04	−.06	−.06	−.12**	−.13**														
7. Evaluation of the waiting time	−.16**	.01	.00	−.09*	−.13**	.26**													
Process																			
8. Screener competence	.07	−.01	−.04	−.09*	−.07	.17**	.19**												
9. Screener friendliness	.14**	.01	.00	.01	−.02	.16**	.21**	.70**											
10. Screener carefulness	.03	−.01	−.01	−.05	−.05	.18**	.28**	.73**	.70**										
11. Enough time to ask questions	.07	.05	−.06	.03	−.01	.10**	.16**	.42**	.38**	.37**									
12. Proceeding of the screening	.09*	.10*	−.01	.02	.03	.10*	.21**	.44**	.39**	.43**	.39**								
13. Burden of the screening	.05	.07	−.04	.04	.02	.07	.23**	.33**	.27**	.34**	.33**	.56**							
14. Crying	−.02	−.01	.06	.10*	.06	−.10*	−.10*	−.21**	−.18**	−.21**	−.12**	−.38**	−.38**						
Outcome																			
15. Feeling frightened after the screening	.11**	.00	.01	−.02	−.01	.18**	.17**	.28**	.26**	.28**	.18**	.29**	.20**	−.12**					
16. Feeling concerned after the screening	.15**	.04	.00	.00	−.01	.16**	.19**	.33**	.27**	.29**	.16**	.32**	.23**	−.19**	.85**				
17. Feeling insecure after the screening	.12**	.03	.03	−.03	−.03	.20**	.20**	.33**	.30**	.30**	.19**	.31**	.22**	−.15**	.83**	.84**			
18. Referral	−.08*	.00	−.01	−.02	.04	−.07	−.06	−.12**	−.09*	−.10**	−.01	−.08*	−.08*	.06	−.36**	−.42**	−.35**		
Meeting of expectations	.04	.03	.03	−.05	−.03	.02	.12**	.29**	.20**	.28**	.26**	.37**	.27**	−.23**	.20**	.19**	.20**	.02	
Satisfaction	.02	−.02	−.06	−.09*	−.06	.17**	.22**	.48**	.42**	.44**	.37**	.47**	.42**	−.28**	.31**	.34**	.30**	−.16**	.36**

* $p < .05$; ** $p < .01$.

Codes: organization 0 = organization A (rural area), 1 = organization B (urban area); crying 0 = not crying or crying but not unpleasant, 1 = crying and unpleasant; referral 0 = no referral, 1 = referral.

Note: associations between two dichotomous variables (organization, crying and referral) were calculated with Phi tests.

Table 3. Results of the ANCOVA for overall parental satisfaction with the US screening for DDH

Measure	Type III Sum of squares	df	Mean square	F	Sig.
Background variables					
Organization	0.76	1	0.76	1.11	.29
Age mother	0.00	1	0.00	0.00	.96
Age father	0.75	1	0.75	1.09	.30
Educational level mother	3.73	2	1.87	2.71	.07
Educational level father	0.25	2	0.12	0.18	.84
Structure					
Evaluation of the traveling time	0.98	2	0.49	0.71	.49
Evaluation of the waiting time	1.48	2	0.74	1.08	.34
Process					
Screener competence	8.42	2	4.21	6.12	.00
Screener friendliness	1.94	2	0.97	1.41	.25
Screener carefulness	0.33	2	0.16	0.24	.79
Enough time to ask questions	10.04	2	5.02	7.30	.00
Proceeding of the screening	4.91	2	2.46	3.57	.03
Burden of the screening	5.23	2	2.62	3.80	.02
Crying	2.75	1	2.75	3.99	.05
Outcome					
Feeling frightened after the screening	0.38	2	0.19	0.27	.76
Feeling concerned after the screening	2.08	2	1.04	1.51	.22
Feeling insecure after the screening	0.18	2	0.09	0.13	.88
Referral	2.26	1	2.26	3.29	.07
Meeting of expectations	13.34	2	6.67	9.70	.00

R Squared = .37.

were mostly women who originated from the Netherlands and were all part of the same age group. Because of this homogenous structure of the study population, it is not surprising that satisfaction was not found to be influenced by the socio-demographic characteristics.

Structure, which is the first determinant related to parental satisfaction, did not predict satisfaction. This concept was measured by the parents' perception of the length of the traveling and waiting time. Parents who perceived the traveling and/or waiting time as short, were not more satisfied than parents who evaluated them as long. This is in contrast to the results of a study by Waseem et al. (2003) in which strong relations between actual and perceived waiting time in a pediatric emergency department and parental satisfaction was found. A sound explanation for this difference is that parents visiting the CHC center for the US screening for DDH do not face immediate consequences if they are not seen in time. Waseem et al. (2003) also found that parents of infants (< 24 months) were less likely to overperceive their waiting time compared to parents of children between 2 and 11 years of age. The authors argue that this can be explained by the amount of time parents spend taking care of their infant, such as feeding and holding their baby. Since parents had to undress their infant before the US screening, they might have perceived the waiting time at the CHC center as short. This can explain the non-relationship found in this study between satisfaction and waiting time.

The competence of the screener was found to be an important factor in the process domain of satisfaction. Parents who perceived the screener as competent reported a higher satisfaction rate

with the screening. In practice, this finding implies that during the screening parents should be convinced that the screener is competent to make the images. Since all screeners have been fully trained to perform the screening, they have to communicate with the parents about their expertise in performing the screening and explain to them what exactly is being done. Other measures related to the screener were the perceived friendliness and carefulness. In this study, no association was found between these characteristics and parental satisfaction.

The current study provided evidence for the important role of communication during the consultation. Parents who were able to ask all their questions were significantly more satisfied with the screening. Other research also shows that if the communication between parents and the health care provider is good, this positively influences satisfaction levels. For example, Hart et al. (2007) found that parents who perceived the communication with their provider as good, more often reported themselves as very satisfied and evaluated the quality of the received care as very high. Likewise, Halfon et al. (2004) reported that parents who asked all the questions they wished to ask, and therefore had all the information they needed, were more satisfied with the length of the visit and also reported a higher global satisfaction. In another study it was found that communication with patients was the most important predictor of patient satisfaction (Liu et al., 2008). This result of our study suggests that during the screening consultation, enough time should be made available for the answering of all the parents' questions. The screener can play an active role in this, by asking the parents if they are well informed and if they have any more questions before they leave the consultation room.

A screening that proceeded fluently and was a low burden to the infant, positively influenced parental satisfaction with the screening. In addition, the perceived unpleasantness of a crying infant was a negative predictor of levels of parental satisfaction. These results show the importance of creating a comfortable environment for the infant. For example, in this study a soft pillow was used to position the infant, which made it easier for the screener to create the image. The results also emphasize the need to inform parents about the screening procedure, to ensure that they know what to expect. Information provision might for example describe the way the infants are positioned with the help of the pillow and the fact that some infants cry during the screening.

The outcome of health consultations is considered to be an important determinant of patient satisfaction. For example, parents of infants who were referred for further tests after a negative newborn hearing test were more emotionally distressed, more worried and less satisfied with the test than parents who had a satisfactory result (Crockett et al., 2005). In this study, no relationship was found between the outcome of the screening and parental satisfaction. Parents' emotions after the screening and a referral to the medical specialist were not related to their reported satisfaction level.

Finally, the results of this study showed that there is a significant positive relationship between the meeting of expectations and parental satisfaction. Other research has also shown that there is a positive association between fulfillment of expectations and satisfaction (George and Robinson, 2010; Hsieh and Kagle, 1991; Korsch et al., 1968; Mancuso et al., 1997; Williams et al., 1995). In practice, this shows the importance of good information provision to parents about all the aspects of the screening. Informing parents adequately about the screening might result in realistic expectations and subsequently in higher satisfaction levels.

The results of this study should be interpreted in light of some limitations. First, a 'self-developed' questionnaire survey was used to assess parental satisfaction. Although the concepts measured in the questionnaire were based on determinants that are known to be related to satisfaction, the questionnaire was not standardized and validated. However, the use of a self-developed

questionnaire made it possible to adapt the questions to this specific (new) screening method and this specific population.

Non-response bias might have led to an artificially high satisfaction score. The mean response rate in this study was more than 60 percent, which is comparable to other satisfaction studies (Sitzia and Wood, 1998). However, it is suggested that if a response bias is present and more satisfied patients are more likely to respond than less satisfied patients, patient satisfaction will be overestimated (Mazor et al., 2002). A study by Lasek et al. (1997) found only relatively small and negligible differences in satisfaction between respondents and non-respondents. When interpreting these results we should be aware of a possible presence of a response bias, which might have led to a high satisfaction level. When generalizing these results to a wider population, caution should be taken, as data are not available concerning non-respondents.

Finally, parents were asked retrospectively if the screening met their expectations. It is likely that parents' evaluation of this item was influenced by the screening itself. We have no insight into the parents' exact expectations and to which degree these expectations were met. Since the concept proved to be significantly related to satisfaction, future research should focus on exploring the different parental expectations before the actual screening and subsequently assess the degree to which the meeting of these expectations influences satisfaction.

US screening for DDH is an innovation in CHC in the Netherlands. This study was performed to gain more insight into parental satisfaction with the consultation at the CHC center and into the factors that influence satisfaction. The results showed that parental satisfaction with the new screening method is high. Satisfaction was influenced by process-related factors, and not by factors related to the structure and the outcome of the screening. Parents who perceived the screener as competent, had enough time to ask questions, perceived the screening procedure as fluent, had the feeling that the screening placed a low burden on their infant and whose expectations were met, were more likely to be satisfied. The perceived unpleasantness of a crying infant had a negative influence on parental satisfaction. When implementing the screening, CHC professionals can adapt these determinants to stimulate high parental satisfaction levels. Information provision before the screening and communication with parents during the screening are means by which parental satisfaction can be influenced positively.

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