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Prognostic factors influencing parental empowerment after discharge of their hospitalized child: A cross-sectional study

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ABSTRACT

Purpose: There is a growing number of children with medical complexity (CMC). After hospitalization, care often has to be continued at home, making transitional care very important. However, many parents do not feel empowered in their role as caregiver for the child. To move forward in this field, we explored prognostic factors associated with parental empowerment after discharge of hospitalized children.

Design and methods: In a cross-sectional study, we collected data on potential prognostic factors found in the literature and on parental empowerment by means of the Family Empowerment Scale (FES). Linear regression analyses were performed to explore the associations between the prognostic factors and the FES.

Results: Data from 228 patients and their parents were analyzed. Out of twelve factors included in the study, three showed significant associations with parental empowerment. Parents of CMC felt more empowered compared to parents of children with less complex conditions ($\beta = 0.20, p = 0.00$). We found a positive association between the age of the child and parental empowerment ($\beta = 0.01, p = 0.00$). Employed couples felt more empowered compared to unemployed couples ($\beta = 0.30, p = 0.00$). These three variables explained 11% of variance in the FES scores.

Conclusions: Parental empowerment is associated with the patient's age, child's medical complexity, and parental employment status.

Practice implications: Attention should be paid to the discharge preparation of parents of children with less medical complexity. Awareness is required for parents of younger children and parental employment status, because they are at risk for lower parental empowerment.

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Introduction and rationale

In the past decades, the chances of survival of pediatric patients with severe diseases and prematurely born infants has increased (Cohen et al., 2011; Knowles et al., 2012). Such success has likely resulted in a growing number of children with medical complexity (CMC). Medical complexity is defined as having chronic conditions, family-identified service needs, functional limitations, and high healthcare use (Cohen et al., 2011; Knowles et al., 2012). CMC are characterized by frequent and long hospital admissions, as well as specific care needs during and after hospitalization (Berry et al., 2014; Simon et al., 2010). Due to medical and organizational developments, children are discharged from

hospital to home earlier (Borghans et al., 2008; Schwartz & Rehder, 2017). Consequently, the transition from hospital to home has become very important, because the care for the children has to be continued at home safely and without interruption.

The hospital-to-home transition is receiving growing attention in pediatric care. Every year, approximately five million children are discharged from hospitals in the European Union (Eurostat, 2020). Although CMC in particular demand care at home, children with less complex needs might require care after discharge as well (Cai et al., 2017; Paquette et al., 2013; Smith & Daughtrey, 2000). For all children with healthcare needs, the hospital-to-home transition requires careful preparation and parental training (Cohen et al., 2011; Desai et al., 2015).

Various evidence-based, nurse-led interventions for a successful and sustainable hospital-to-home transition have been developed, e.g. parent education programs, home visits, and follow-up calls after discharge (Auger et al., 2014). Despite these interventions, parents often encounter problems in providing care at home (Glick et al., 2017; Ronan et al.,

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2020), such as medication errors, complications, and inadequate pain treatment (Lushaj et al., 2016). It is estimated that these problems result in unplanned readmission rates of up to 6–8% (Franck et al., 2015; Heslin et al., 2018; van der Bruge, 2017). In addition, parents report stress, anxiety, and depression after their child's discharge (Heslin et al., 2018; Streisand et al., 2008; Woolf et al., 2016; Wray et al., 2011). These symptoms tend to improve when parents feel empowered in their role as caregiver for their child (Liu et al., 2010; Melnyk et al., 2004; Nachshen, 2005).

According to the World Health Organization (WHO), empowerment primarily focuses on the ability of individuals to control their personal lives and make independent decisions (WHO, 1998; WHO, 2009). Subsequently, patient empowerment is defined as “a process in which patients understand their role, are given the knowledge and skills by their healthcare provider to perform a task in an environment that recognizes community and cultural differences and encourages patient participation” (WHO, 2009, p. 190).

Analogous to this WHO definition, parental empowerment can be defined as “the process through which parents are able to increase the control they have over decisions and actions affecting their child's health” (Ashcraft et al., 2019, p. 3).

Although many hospital-to-home interventions have been developed, not all parents seem to benefit (Berry et al., 2013), suggesting the need for more tailored interventions (Desai et al., 2015). A better understanding of the patient, parental, medical, organizational, and discharge characteristics might help to identify families that are at risk and guide nurses and other healthcare professionals to provide tailored hospital-to-home care. To the best of our knowledge, the characteristics associated with parental empowerment after discharge of hospitalized children are unknown. Therefore, this study aimed to determine which prognostic factors—which consist of patient, parental, medical, organizational, and discharge characteristics—influence the empowerment of parents of pediatric patients at hospital discharge.

Methods

Study design

A cross-sectional design was used to explore prognostic factors associated with parental empowerment. The checklist of the STrengthening the Reporting of OBServational studies in Epidemiology (STROBE) was used during the execution and reporting of the study (von Elm et al., 2007).

Setting and participants

The study took place at Emma Children's Hospital, which is part of the Amsterdam University Medical Center and affiliated with the University of Amsterdam, the Netherlands. This pediatric hospital provides highly specialized top-referral care to children from birth to 18 years old on four general pediatric wards, a Pediatric Intensive Care Unit (PICU), and a Neonatal Intensive Care Unit (NICU). We conducted our study on the four non-ICU pediatric wards. The study population consisted of all parents (at least one parent per child) of children aged 0–18 years discharged from the participating wards between January 1, 2021 and March 31, 2021.

In- and exclusion criteria

Parents of children who were discharged after a hospital length of stay (LOS) of at least 24 h were asked to participate in the study. Children with at least one parent proficient in spoken and written Dutch, who had also given informed consent according to Dutch law, were included in the study.

Patients discharged from the Neonatal Intensive Care Unit (NICU) and Pediatric Intensive Care Unit (PICU) were excluded from the study. Parents of deceased children were not approached.

Sample size

The sample size was determined by Green's formula (Green, 1991) and recalculated using G^* power (Faul et al., 2009). Assuming a R^2 of 0.15, an alpha of 0.05, and a power of 0.80, the required sample size would be 127 participants.

Measures

Family empowerment

During the study period the empowerment of parents was measured using the validated Family Empowerment Scale (FES) (Koren et al., 1992; Vuorenmaa et al., 2014). The original FES was modified to the Dutch situation (Kruijsen-Terpstra et al., 2016) and showed sufficient content validity for parents of children with a chronic condition in a hospital setting: Content Validity Index 0.88 (Segers et al., 2019). The Dutch version of the FES consists of 24 items with a sumscore that ranges from 1 (low empowerment) to 5 (high empowerment).

Prognostic factors

We conducted a literature review to identify potential prognostic factors associated with parental psycho-social outcomes after discharge of hospitalized children. Thirty-nine potential factors were identified. After in-depth discussions in the research group, it was decided to include twelve factors in this study, based on perceived relevance for hospital-to-home transition from general pediatric wards. These twelve factors were divided into five categories. We decided to include one medical factor (medical complexity), two child factors (age and visible signs of illness [VSI]), five parent factors (age, gender, level of education, employment, and marital status), two organizational factors (discharge teaching/discharge preparation and LOS), and two factors upon discharge (medication and technical nursing procedures/medical equipment). An overview of the twelve factors with the references is presented in Appendix A.

Data collection and procedures

Nurses were informed by the researcher (CJvdP) about the study and the required informed consent procedure by means of personal instructions, digital meetings, and newsletters from the wards. Additionally, a week before the start of the study, posters and information letters for parents were distributed on the wards. The nursing team leaders were asked to direct their team members to provide parents with information about the study. Subsequently, nurses asked one of the parents for written permission to use their email address for sending a questionnaire after discharge.

The questionnaire was accessible through Castor EDC, a web-based, certified clinical data management platform. Two weeks after discharge one of the child's parents received an email with a link to the digital questionnaire, which included a question about informed consent, the FES, additional questions about their demographics (gender, age, marital status, occupation, and education level), and their child's status at discharge (visible signs of illness, medical equipment, discharge preparation). Fourteen days was chosen as the follow-up period to distribute the questionnaire, as this is frequently used in similar studies (Garfield et al., 2018; Hager, 2010; Qiu et al., 2019; Zhang et al., 2021). Two reminders were sent to the non-responders with one week in between in order to prevent attrition (Edwards et al., 2009).

Data about the potential prognostic factors and demographics of the participating pediatric patients (diagnosis, medical procedures, age, gender, length of stay (LOS), medication) were extracted from the Electronic Patient Files (EPF).

Ethical issues

The Medical Ethics Review Committee of the Amsterdam Medical Center reviewed the study protocol and decided this study was not subject to the Dutch Medical Research Involving Human Subjects Act (W20_525 # 20.582). All data were treated according to the European General Data Protection Regulation. All participating parents gave informed consent.

Statistical analyses

All analyses were performed using IBM SPSS Statistics software (version 24).

For normal distributed continuous data means and standard deviations (SD) were calculated. Non-normal distributed continuous data were presented as median and interquartile range (IQR). For categorical data, absolute numbers and percentages (%) were used.

Univariable linear regression analysis was performed to select factors associated with family empowerment. Potential prognostic factors were selected for the multivariable linear regression analysis when they showed statistical significance defined as $p \leq 0.2$. Before performing the multivariable linear regression analyses, we tested the following assumptions: linearity, normal distribution, and homoscedasticity. Multicollinearity was tested by using collinearity diagnostics to obtain a Variance Inflation Factor (VIF). With a VIF above five, one of the correlating factors would be removed. We executed a multivariable linear regression analysis with backward multiple regression. The results were specified as regression coefficient β , $p < 0.05$ and 95% confidence intervals (95% CI).

We planned multiple imputation in case of $>5\%$ missing data (Rippe et al., 2013).

Results

Sample

During the study period, 580 patients were discharged from hospital to home. In total 461 (79%) parents of these patients were approached to participate in the study; 57 parents were excluded because of not being proficient in Dutch, and 23 parents refused to participate. As a result, 381 parents gave permission to use their email to send the questionnaires. Finally, we collected the data of 228 children and their parents, representing a response rate of 60% of those who consented to participate (Fig. 1).

Ninety-eight (43.0%) patients were female. The median age of the patients was 4 years (IQR 0–11). Fifty-six (24.6%) patients were identified as CMC. Of the discharged patients, 194 (85.1%) had medication upon discharge. The mean age of the parents was 39.3 years (SD 8.4). The majority of the parents who participated were female (76.8%). Most parents were married or were living together (85.1%) and were dual earners (70.6%). An overview of the sample characteristics is shown in Table 1.

Missing values

The total dataset showed 0.33% missing values and did not exceed the 5% on a particular item.

Results of the FES

The mean scores on the 24 FES items were all ≥ 3.72 , with the lowest mean score on the question “I know the steps to take when I am concerned my child is receiving poor services” (mean 3.72, SD 1.02) and the highest mean score on the question “I feel confident in my ability to help my child grow and develop” (mean 4.55, SD 0.57). The results of the FES are summarized in Table 2.

Univariable linear regression

The univariable linear regression analysis resulted in ten associations ($p \leq 0.20$) with the total score of the FES: CMC ($\beta = 0.171$, $p < 0.0001$), age patient ($\beta = 0.01$, $p = 0.01$), number of different medications upon discharge ($\beta = 0.02$, $p = 0.02$), age parent ($\beta = 0.01$, $p = 0.03$), methods of medication administration ($\beta = 0.05$, $p = 0.07$), gender parent ($\beta = 0.10$, $p = 0.11$), and number of technical devices/ nursing procedures/equipment upon discharge ($\beta = 0.03$, $p = 0.20$). Regarding the variable employment status, the categories one parent with job ($\beta = 0.31$, $p = 0.03$), both parents with job ($\beta = 0.26$, $p = 0.04$), and single parent with job ($\beta = 0.34$, $p = 0.08$) versus the category both parents with no job showed significant associations. The results of the univariable regression analysis are summarized in Table 3.

Multivariable linear regression analyses

The multivariable linear regression analysis yielded a model with three statistically significant variables: CMC ($\beta = 0.20$, $p < 0.0001$), age patient ($\beta = 0.01$, $p = 0.0001$), and parental employment status

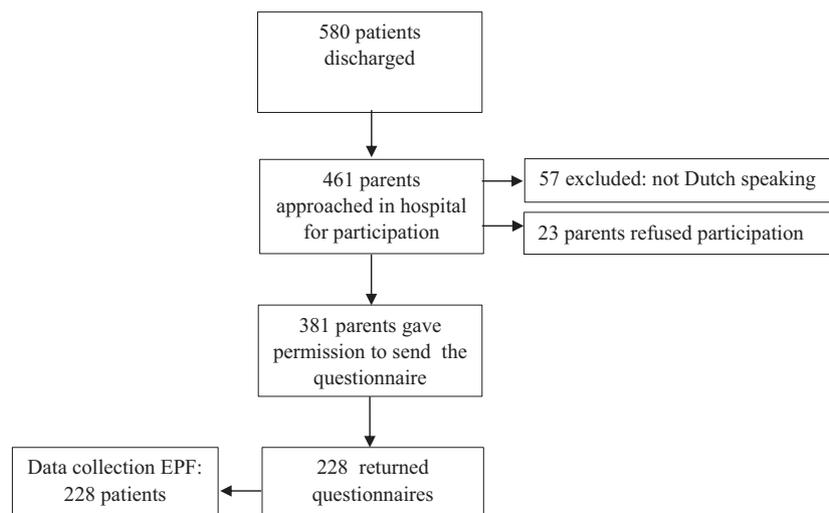


Fig. 1. Flow diagram data collection.

Table 1
Demographic characteristics of patients and parents.

Variables	Sample (N = 228)
Patient variables	
Age – Median (IQR)	4 (0–11)
Gender	
Female – N (%)	98 (43.0)
Visible signs of illness	
Yes – N (%)	74 (32.5)
Medical complexity	
Yes – N (%)	56 (24.6)
Medication upon discharge	
Yes – N (%)	194 (85.1)
Length of stay in days – Median (IQR)	4 (2–8)
Number of different medications upon discharge – Median (IQR)	2 (1–4)
Parent variables	
Age – Mean (SD)	39.3 (8.4)
Gender	
Female – N (%)	175 (76.8)
Level of education – N (%)	
Primary school	2 (0.9)
High school	15 (6.6)
College	70 (30.7)
University of applied sciences	82 (36.0)
University	59 (25.9)
Marital status – N (%)	
Single parent	25 (11.0)
Living together/married	194 (85.1)
Living separate/divorced	8 (3.5)
Widow	1 (0.4)
Employment status – N (%)	
Both parents without occupation	4 (1.8)
One parent with occupation	31 (13.6)
Both parents with occupation	161 (70.6)
Single parent without occupation	7 (3.1)
Single parent with occupation	20 (8.8)
Missing	5 (2.2)
Discharge preparation/education – N (%)	
Yes	84 (36.8)
Not applicable	111 (48.7)

IQR: Inter Quartile Range Q1–Q3.

SD: Standard Deviation.

(single earners ($\beta = 0.25$, $p = 0.01$) and dual-earners in two-parent families ($\beta = 0.23$, $p < 0.0001$), and single parents with no job ($\beta = 0.32$, $p = 0.04$). These three variables explained 11% of variance in the FES scores ($R^2=0.11$). The results of the multivariable linear regression analysis are summarized in Table 4.

Discussion

The aim of this study was to determine prognostic factors associated with parental empowerment after the discharge of a child from hospital to home. Our results show that both child and parental factors were associated with parental empowerment. Parents with CMC felt more empowered than parents of with less complex conditions. Also, the higher the age of the child, the higher the parental empowerment. Double-income couples, single-income couples, and unemployed single-parents felt more empowered compared to unemployed couples. These three variables explained 11% of the variance in the empowerment as measured by the FES.

Previous research showed that the mental health of parents is worse in parents of CMC compared to the general population (Cohen et al., 2011; Fischer et al., 2012; Knowles et al., 2012; Ratliffe et al., 2002; Resendez et al., 2000). Because mental health is associated with empowerment (Woodall et al., 2010), we hypothesized that parents with CMC would show less empowerment. However, our results show that parents of CMC feel more empowered compared to parents without CMC. An explanation for this result could be that care coordination

Table 2
Family Empowerment Scale survey results.

Question	Mean	SD
1. When problems arise with my child, I handle them pretty well.	4.37	0.66
2. I feel confident in my ability to help my child grow and develop.	4.55	0.57
3. I know what to do when problems arise with my child.	4.35	0.71
4. I feel my family life is under control.	4.21	0.73
5. I am able to get information to help me better understand my child.	4.36	0.66
6. I believe I can solve problems with my child when they happen.	4.18	0.72
7. When I need help with problems in my family, I am able to ask for help from others.	4.25	0.81
8. I make efforts to learn new ways to help my child grow and develop	4.36	0.69
9. When dealing with my child, I focus on the good things as well as the problems.	4.49	0.55
10. When faced with a problem involving my child, I decide what to do and then do it.	4.33	0.62
11. I have a good understanding of my child's disorder.	4.31	0.73
12. I feel I am a good parent.	4.28	0.61
13. I feel that I have a right to approve all services my child receives.	4.12	0.78
14. I know the steps to take when I am concerned my child is receiving poor services.	3.72	1.02
15. I make sure that professionals understand my opinions about what services my child needs.	4.28	0.74
16. I am able to make good decisions about what services my child needs.	4.28	0.64
17. I am able to work with agencies and professionals to decide what services my child needs.	4.50	0.58
18. I make sure I stay in regular contact with professionals who are providing services to my child.	4.31	0.68
19. My opinion is just as important as professionals' opinions in deciding what services my child needs.	4.14	0.83
20. I tell professionals what I think about services being provided to my child.	3.97	0.80
21. I know what services my child needs.	4.10	0.73
22. When necessary, I take the initiative in looking for services for my child and family.	4.39	0.65
23. I have a good understanding of the service system that my child is involved in.	4.09	0.72
24. Professionals should ask me what services I want for my child.	3.77	0.83

and information provision upon discharge gets more attention for parents with CMC than for parents without CMC. An additional explanation is that parents with CMC get more experienced over time, resulting in more empowerment. To the best of our knowledge no evidence is available to support this explanation, and this should be confirmed in future research.

This study found that the older the child, the higher the empowerment score. This might be explained by the perceived vulnerability of younger children. The vulnerability of patients in the preschool age has been previously described (Gabard-Durnam & McLaughlin, 2019; Small & Melnyk, 2006), as has the negative association between parental mental health status after discharge and children under the age of four (Buyse et al., 2008; Small, 2002). Although we acknowledge that mental health status and empowerment are not synonymous, research shows these concepts are associated (Woodall et al., 2010). Houtzager et al. (2014) found that children between five and seven years old were perceived as more vulnerable by parents than children between eight and eighteen years old (Houtzager et al., 2014). Perceived vulnerability may lead to feelings of being unable to provide care for the child or seek support resources (Scannell, 2020), i.e. feeling less empowered according to the definition (Ashcraft et al., 2019; Fumagalli et al., 2015).

Our results show that parents in two-parent families with a single or double income along with unemployed one-parent families feel more empowered compared to unemployed two-parent families. Obviously,

Table 3
Univariable linear regression analysis.

Variable	β	P-value	95% CI
Patient factors			
Age patient (in years)	0.01	0.01*	[0.00, 0.02]
Visible signs of illness (yes vs no)	0.06	0.31	[−0.05, 0.16]
Factors upon discharge			
Number of technical devices/Nursing procedures/			
Equipment upon discharge	0.03	0.20*	[−0.01, 0.07]
Medication (yes vs no)	0.00	0.96	[−0.15, 0.14]
Number of different medications	0.02	0.02*	[0.00, 0.04]
Methods of medication administration	0.05	0.07*	[−0.00, 0.10]
Medical factors			
Children with Medical Complexity (CMC)(yes vs no)	0.171	<0.0001*	[0.06, 0.29]
Organizational factors			
Discharge teaching before discharge			
Yes vs no	−0.01	0.86	[−0.16, 0.14]
Not applicable vs no	−0.02	0.83	[−0.13, 0.17]
Length of Stay, in days	0.00	0.91	[−0.00, 0.00]
Parental factors			
Age parent (in years)	0.01	0.03*	[−0.00, 0.01]
Gender parent (female vs male)		0.11*	[−0.02, 0.21]
Education parent			
High school vs primary school	−0.13	0.64	[−0.70, 0.43]
College vs primary school	0.02	0.93	[−0.52, 0.56]
University of applied sciences	0.03	0.92	[−0.51, 0.57]
University	−0.08	0.77	[−0.62, 0.46]
Marital status			
Living together (married vs single)	0.02	0.78	[−0.14, 0.18]
Living separate (divorced vs single)	0.14	0.38	[−0.17, 0.45]
Widow vs single	−0.28	0.48	[−1.05, 0.50]
Employment status			
one parent job vs both no job	0.31	0.03*	[0.03, 0.60]
both parent job vs both no job	0.26	0.04*	[0.01, 0.52]
single parent, no job vs both no job	0.34	0.08*	[−0.04, 0.72]
single parent with job vs both no job	0.15	0.33	[−0.15, 0.45]

CMC: Children with Medical Complexity.

CI: Confidence Interval.

 β : standardized coefficients beta.* p-value ≤ 0.2 .

in two-parent families, the care of the child might be divided between the parents, which may influence their feeling of empowerment. In addition, economic security and sufficient financial resources make it possible to organize professional support for the family (Baddour et al., 2021). This might increase the parents' feeling of empowerment (Lawoko, 2007). Previous research has shown that unemployed parents encounter more psychological problems than employed parents (Baddour et al., 2021; Landolt et al., 2011; Lawoko, 2007). The higher level of empowerment in unemployed one-parent families that we found in our study remains unexplained.

Surprisingly, no association was found between polypharmacy and parental empowerment. This is not congruent with previous

Table 4
Multivariable linear regression analysis.

Variables model	β	p-value	95%CI
Constant	3.93	<0.0001*	[3.77, 4.09]
CMC	0.20	<0.0001*	[0.09, 0.31]
Patient age at discharge	0.01	<0.0001*	[0.01, 0.02]
Paid job			
One parent job vs both no job	0.25	0.01*	[0.07, 0.44]
Both parent job vs both no job	0.23	<0.0001*	[0.08, 0.37]
Single parent, no job vs both no job	0.32	0.04*	[0.02, 0.63]

CMC: Children with Medical Complexity.

 β : Standardized coefficients beta.

CI: Confidence Interval.

* p-value <0.05.

publications that describe statistically significant associations between the number of medications and parental functioning or well-being (Cousino et al., 2017; Fischer et al., 2012; Lakshmanan et al., 2017; McAndrew et al., 2019).

Finally, our results did not show an association between the level of education and parental empowerment. This contrasts with previous research, which has shown a relationship between mental status and the level of education (Baddour et al., 2021; Heslin et al., 2018; Lawoko, 2007). This discrepancy might be explained by the small number of low-educated parents in our sample.

Limitations

We acknowledge several limitations of the study. First, the finding of only three variables associated with parental empowerment and the explained variance of only 11% might be due to the limited heterogeneity in the FES scores, making it difficult to find associations. Apparently, the participating parents already experienced a high degree of empowerment, a finding seen in previous research (Alsem et al., 2019). An explanation for this could be that the majority of the participating parents were highly educated and Dutch speaking, which might have influenced the empowerment scores. When discharge information and education is not sufficiently understood, parents may feel less able and confident to provide the required care, thus feeling less empowered after discharge (de Moissac & Bowen, 2019). Since empowerment scores of non-Dutch speakers and/or less educated parents were not collected, the empowerment of those parents remains unclear. Second, we have not considered the importance of the duration of the child's illness and did not collect these data. This information could have been of value because parents with long-term experience caring for their chronically ill child may feel more empowered than parents whose child has only just been diagnosed. Third, 40% of the parents who consented to the use of their email did not return the questionnaires. If specifically those parents might have felt overburdened after returning home and did not have the energy to fill out the questionnaire, we might have missed less empowered parents. Finally, all data were obtained from a single university hospital. This might limit the generalizability of our results.

Future research

More research is needed to move forward in this field and eventually develop a family-tailored hospital-to-home transition. Additional studies are required to explore the prognostic factors associated with parental empowerment in a more heterogeneous group of participants. In this study, parents without CMC felt less empowered than parents with CMC, suggesting less preparation. In order to test this hypothesis, research should be conducted to compare the hospital-to-home preparation provided to parents with CMC and without CMC.

Additionally, consensus about a definition of CMC and the criteria a patient must meet to be classified as CMC are desirable for future research. This has not been clearly established in the available literature, and there seems to be great variation. In our study, a child was classified as CMC when it met all four of Cohen's domains and the operationalization of the domains was practice-based.

Research is especially needed among parents who are not inclined to participate in studies. It is important that we reach out to these parents, because especially these parents may need tailored hospital-to-home interventions. In order to increase representativeness of study samples in future research, a cross-cultural validation of the FES is needed to collect reliable information from parents with different cultural backgrounds. Additionally, parents with low literacy may benefit from a more personal approach, such as having the study explained or support with filling out questionnaires.

Implications for clinical practice

Apart from the attention given to parents of CMC to guarantee their empowerment, attention should also be given to a thorough discharge preparation for parents of children with less medical complexity. In addition, healthcare professionals should be aware that the age of the child and parental employment status influence the empowerment of parents after discharge.

Conclusion

This study showed that parental empowerment is higher in parents with CMC compared to parents of children with less complexity. Additionally, parents feel more empowered as the child ages. In two-parent families with dual earners, two-parent families with single earners, and unemployed single-parent families, a higher empowerment score was measured. This knowledge, hopefully supplemented by future research into heterogeneous samples, may contribute to the development of tools for tailored discharge preparation for parents of pediatric patients in the hospital-to-home transition.

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CRedit authorship contribution statement

Cor-Jan van der Perk: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Visualization, Project administration, Validation. **Liz van de Riet:** Writing – review & editing, Validation. **Mattijs Alsem:** Writing – review & editing, Validation. **Johannes B. van Goudoever:** Writing – review & editing, Validation, Resources. **Jolanda Maaskant:** Conceptualization, Methodology, Formal analysis, Writing – review & editing, Validation, Supervision.

Twelve factors with references

	Factors	References
Medical factor	Medical complexity defined as having chronic conditions, high needs, functional limitations and high healthcare use (Cohen et al., 2011).	Aitken et al., 2002; Fischer et al., 2012; Landolt et al., 2011; Lerret et al., 2015; Placencia & McCullough, 2012
Child factors	Age Visible signs of illness	Buyse et al., 2008 Northrup et al., 2013
Parent factors	Age Gender Level of education Employment Marital status	Northrup et al., 2013; Vance et al., 2020 Howe et al., 2014 Fischer et al., 2012; Placencia & McCullough, 2012; Obregon et al., 2019; Sumpter et al., 2011 Lakshmanan et al., 2017; Landolt et al., 2011; Northrup et al., 2013; Obregon et al., 2019; Sumpter et al., 2011 Franck et al., 2020; Howe et al., 2014; Placencia & McCullough, 2012; Vance et al., 2020
Organizational factors	Discharge teaching/Discharge preparation Length of stay	Lerret et al., 2015 Obregon et al., 2019; Pinto et al., 2017
Factors upon discharge	Medication Technical nursing procedures/ Medical equipment	Fischer et al., 2012; McAndrew et al., 2019 Lakshmanan et al., 2017; Placencia & McCullough, 2012

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