

Parents' decision to use e-consults in preventive youth health care: A cross-sectional study on parental and nurse factors

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Abstract

Using digital health interventions in prevention programs for families with young children is often optional for parents. In preventive youth health care, nurses routinely discuss availability and suitability of this option with parents. It remains unknown what drives parental decision-making and which factors influence the decision regarding use of e-consults. This study aimed to identify which nurse and parent factors are related to the parents' decision. Data of 718 parents and 41 nurses were collected. It turned out that the option e-consult was not discussed with 206 parents. Generalized linear mixed model analyses showed that nurses with 0–3 years working experience discussed optional e-consults significantly more often with parents. Most parents (66.4%) decided to use e-consults. Parents were less likely to use e-consults when nurses had 3–6 years of working experience and a high self-reported level for 'Collaborator'. E-consults have been in place for over 3 years, likely making them an integral part of routine care and fostering greater nurse confidence for nurses with 0–3 years of working experience. Implementation efforts should primarily focus on nurse adoption rather than parental uptake. The findings stress the value of considering the perspectives of nurses and parents when implementing person-centered digital health interventions.

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Introduction

In recent decades, significant research and funding have focused on developing digital health interventions for preventive Youth Health Care (YHC) (Kickbusch et al., 2021). YHC provides preventive health care for children, adolescents and their parents (Garg et al., 2019). Key components of YHC include monitoring growth and physical, mental and psychosocial development, vaccination, anticipatory parental guidance and care-coordination (Garg et al., 2019).

Digital health interventions can be seen as tools enabling parents, caregivers and professionals to assess the parenting and developmental situation of children (Kickbusch et al., 2021). Results of meta-analysis and reviews show that these interventions can make a significant positive contribution to parents and children (Bergin et al., 2020; Komanchuk et al., 2023; Spencer et al., 2020). Digital health interventions enable a range of services in YHC. Examples are: an app to contribute communication and collaboration between nurses and parents (Blanson Henkemans et al., 2018), web-based management support to prevent overweight and obesity (Heerman et al., 2022) and a-synchronous e-consults for typically developing children, consisting of validated parent-reported questionnaires with automated feedback and nurse follow-up when indicated (Brunekreeft-Budding et al., 2025).

Currently, the use of digital health interventions in YHC is generally optional for parents of young children (Blanson Henkemans et al., 2018; Brunekreeft-Budding et al., 2025; Heerman et al., 2022). Parents can often choose whether to use digital health interventions as supplement to or instead of in-person care (Blanson Henkemans et al., 2018; Brunekreeft-Budding et al., 2025; Heerman et al., 2022). This flexibility within universally offered prevention programs contributes to the delivery of personalized care (Bierman et al., 2023; Blanson Henkemans et al., 2018; Brunekreeft-Budding et al., 2025). It may also be more cost-effective, as parents with greater support needs can engage more intensively with YHC, while those with lower needs require fewer resources (Bierman et al., 2023). Within the context of social isolation, such as during coronavirus disease 2019, digital health interventions in YHC were shown to be suitable for parents of young typically developing children (Solis-Cordero et al., 2022). With growing resource constraints upon the professional workforce and financial capacity, this flexibility is essential to ensure the continued delivery of personalized care (Bierman et al., 2023).

In general, it is known that parents who use digital health information about their child's development and parenting situation are younger and have younger children (Baker et al., 2017; Fierloos et al., 2022). However, conclusive evidence regarding work status, gender and educational status is lacking (Baker et al., 2017; Fierloos et al., 2022). For specific intervention approaches, the literature recommends research into the degree to which parent characteristics affect the usage and for studies to address the pervasive challenge of parental engagement and retention (Bierman et al., 2023). This study investigated the factors and considerations that determine which parents decide to use e-consults in YHC in the Netherlands.

A digital care pathway with e-consults offers a promising opportunity to differentiate care in YHC (Brunekreeft-Budding et al., 2025). This pathway is specifically designed for families at low risk for parenting and developmental problems. Low risk is defined as a balanced situation in which there is a favorable living environment for the child's development (e.g. in physical, cognitive and social-emotional terms) (Van der Put et al., 2023). In the present study, Structured Problem

Analysis of Raising Kids (SPARK) was used to determine eligibility for e-consults. SPARK has been shown to improve early detection of parenting and developmental problems and effectively discriminates between high, increased- and low risk groups among children aged 18 months (Staal et al., 2011, 2013; Van der Put et al., 2023; Van Stel et al., 2012).

In this study, a-synchronous e-consults at ages 2, 2.5 and 3 years replaced physical consultations at 2 and 3 years. E-consults consisted of validated parent-reported questionnaires for digital monitoring of parenting and developmental situations as well as an opportunity for parents' questions. Parents received automatically generated digital feedback. Nurses were only notified to contact parents personally if questions or concerns arose. Parents always had the option to initiate an appointment themselves.

Research that evaluates the use of digital health interventions needs to consider the interactions between the system, the user, and the context in order to understand the users' decision process when selecting digital health interventions (Sieverink et al., 2019). Such information is valuable for evaluating: (a) the actual use of digital health interventions, (b) their implementation, and (c) to determine their full potential (Kip et al., 2025; Sieverink et al., 2019). Contextual factors, such as professional characteristics, influence parents' decision (Schuler et al., 2025). Since nurses discussed the optional e-consults with parents, it is essential to examine how their professional characteristics and competences (Konttila et al., 2019) may influence parents' willingness to participate.

Aim

To gain more insight into factors contributing to the decision of parents to use e-consults in YHC, this study investigated the relations of parent and nurses' characteristics and considerations with this decision.

Methods

Study design

A cross-sectional, observational quantitative study was conducted. Self-reporting data from both parents and nurses were collected. Invited to participate in this multi-actor study were all parents of children with low risk based on the SPARK (Staal et al., 2011) at 18-months who visited YHC in the Dutch province Zeeland and the nurses who provided the care from May 2017 until May 2018. YHC Zeeland has 23 different locations with a total of 80 nurses.

Ethical considerations

The study was assessed by the Medical Research Ethics Committee at the University Medical Center of Utrecht (nr 18/237) and was considered not subject to the Dutch Medical Research Involving Human Subjects Act. This study was conducted in compliance with the European Code of Conduct for Research Integrity (The European Code of Conduct for Research Integrity Revised Edition, 2017). All participants provided digital informed consent before taking part in the study.

Setting

A child's routine care consists of the use of the SPARK during a physical consultation between the parent(s) and YHC nurse. The overall risk-assessment is registered in the digital healthcare record. A consultation based on the SPARK aims at shared decision-making between the parent and YHC nurse about any further care. The optional digital care pathway with e-consults is discussed with parents of children with a low risk for parenting and developmental problems, who have a good command of the Dutch language, be digitally skilled and have digital means (Brunekreeft-Budding et al., 2025).

Study procedure

Parents. Parents who visited YHC in the Dutch province Zeeland for their child's 18-months consultation from May 2017 until May 2018 and whose child's records indicated low risk according to the SPARK received an invitation to participate in this study by email. Parents were required to use one survey questionnaire per family. If no response was received after 2 weeks, a reminder was sent.

Nurses. Nurses who provided consultations for 18-month-old children were also invited to participate in this study by e-mail. Nurses were provided with information about the study and informed consent form. To enhance response rates, nurses were invited to participate during an organizational meeting and were immediately given the opportunity to complete the survey questionnaire and a survey questionnaire. Nurses who were present during this meeting were encouraged to remind their absent colleagues about the study.

Questionnaires

Questionnaire for parents. Parents answered questions about their age, nationality, highest level of education and work situation of parent 1 (usually mother) and parent 2 (usually father) and their number of children. The questionnaire also included predefined options derived from the development and feasibility study (Brunekreeft-Budding et al., 2025).

These questions were included: 'Did you visit the YHC nurse when your child was 18-months old?' and 'Has the YHC nurse discussed the optional e-consults with you?' and 'Have you decided to use e-consults?'. Predefined options for parents who decided to use e-consults were: I'm interested in new developments; e-consults fits into my situation; on advice of the YHC nurse; experiences of other parents; it saves a visit to the YHC center; it's important that parents participate in research; if everything goes well, it is a good alternative; I can do it at a time that suits me; other reasons. Predefined options for parents who decided to not use e-consults were: I'm not interested in new developments; e-consults doesn't fit into my situation; the YHC nurse advised against it; experiences of other parents; I didn't get enough information; I expected that it will be of no use to me; I wanted direct contact with the nurse; I wanted to weigh and measure my child during a consultation; other reasons.

Questionnaire for nurses. To collect data about nurses' characteristics, an existing questionnaire on YHC nurse competences was used (Benjamins et al., 2015). Along with competences, the characteristics collected were: years of work experience, working hours per week, gender and highest level of completed education.

The YHC nurses competences questionnaire has a good content validity (Benjamins et al., 2015) and is based on the CanMEDS competency framework, designed by the nursing association (Area

of Expertise Youth Health Nurse, 2014). CanMEDS can be seen as an internationally recognized base for competency-based healthcare education (Janssens et al., 2022; Van der Vleuten, 2015) and is widely used in the Netherlands.

The YHC questionnaire covers seven competences: (1) Caregiver, (2) Communicator, (3) Collaborator, (4) Leader, (5) Health Advocate, (6) Scholar, and (7) Professional. Each competence has a number of skills. For each skill, nurses can choose one of the four following categories: (a) I have never learned this, (b) I learned this, but I never use it in my work, (c) I have learned this, and I use it partly in my work, and (d) I have learned this and fully use it in my work.

Data analysis

Data were analyzed using SPSS Statistics version 28.0 (IBM SPSS Statistics, 2021). Distribution of each continuous variable was examined using graphical (histograms and Q-Q plots) and statistical (Shapiro–Wilk) methods. Preconditions for parametric statistics were met. Distribution of nominal and ordinal variables are examined with frequency tables. Due to a lack of variability for ‘work situation parent 2’ and ‘gender of nurse’ were excluded from analysis. For other nominal and ordinal variables, preconditions were met. For descriptive purposes, percentages for categorical variables were computed and means and standard deviations for continuous variables.

Univariate analysis. The categorical variable ‘parents have decided to use the e-consults’ (yes/no) was used as a dependent variable. An independent sample t test was used to test the association between continuous variables and the dependent variable. To determine associations between the categorical variables and the dependent variable, the chi-square test for independence was used. Available case analysis was used to handle missing data.

Generalized linear mixed model. The data of parents were clustered by nurses, because the same YHC nurse may have attended the 18-months consultation of several participating parents. To account for the clustering of parent data by nurses, a Generalized Linear Mixed Model (GLMM) was used. This method allows the analysis of data with a hierarchical structure through the inclusion of fixed and random effects in the model (Bono et al., 2021). The fixed effects, which are consistent within a cluster, are the nurses’ characteristics. Parents’ characteristics are included in the GLMM as random effects, because these variables can vary within a cluster. The probability distribution is binomial and the link function is logit, due to the binomial nature of the dependent variable. Maximum Likelihood is used as the estimation method in the GLMM. All independent variables were included in the GLMM if the assumptions for the GLMM were met. Therefore, goodness of fit methods such as hypothesis testing or model comparison were not relevant.

All assumptions for the GLMM were met, except for ‘age of parent 2’. A significant log odds result (.023) indicated violation of linearity. This variable was excluded from GLMM, because the expected frequencies assumption (<25 year) was also violated. Multicollinearity between the independent variables was below Spearman’s or Pearson’s rho 0.8.

Regardless of the outcome of the univariate analysis, all variables were included in the GLMM because they were correlated with each other. Included variables were number of children and for parent 1: age, work status, educational status and nationality; for parent 2: educational status and nationality; and for nurses: average scores on seven competences (Caregiver, Communicator, Collaborator, Leader, Health Advocate, Scholar, Professional), educational status, years of working experience and working hours per week.

First, the flow of participants was investigated. Because 206 (28.7%) parents indicated that the optional e-consults had not been discussed, an additional GLMM was used to determine which characteristics were related to the YHC nurses' discussion for optional e-consults with parents. The categorical variable 'Has the YHC nurse discussed the optional e-consults with you' (yes/no) was used as the dependent variable. The same independent variables were included as described above.

Missing data. For most datasets, missing at random (MAR) is more realistic than missing completely at random (Harder et al., 2024). Due to clustering, missing data of one YHC nurse were found in multiple parent cases. This affected the pattern of missing values. Distinction between MAR and missing not at random patterns cannot be established due to the lack of statistical tests for clustered data (Van Buuren, 2018). Although sensitivity analysis can be performed to evaluate departures from the MAR assumption in predictive models (Lee et al., 2023), such methods have not yet been developed for cluster analysis (Harder et al., 2024). To assess the impact of the missing values on the outcome, missing values for independent variables were treated as a separate category. If this separate category differed significantly in the chi-square test, the GLMM analysis was performed with and without it.

Results

Of the 2200 low risk families, 807 (36.7%) responded to the questionnaire and 749 (34.0%) gave permission to use their data. As shown in Figure 1, 718 (32.6%) low risk families had contact with YHC. Of all the parents who had contact with YHC, 512 (71.3%) indicated e-consults were discussed, and 336 of these parents (66.4%) decided to use e-consults. The optional e-consults were not discussed with 206 (28.7%) parents.

The characteristics of the 718 parents included in this study appear in Table 1. The average age of parents was 31.69 ($\sigma = 4.39$) and the majority of the parents had an intermediate or high educational level, were employed and Dutch nationals, and had one or two children.

All 80 nurses were invited to participate in this study, and 41 (51.3%) nurses chose to do so. Table 2 shows the characteristics of the YHC nurses included in this study. The majority of the participating YHC nurses had >20 years of working experience ($n = 16$, 39.0%), a post bachelors' or master's degree ($n = 27$, 65.9%) and worked 25–32 hours a week ($n = 17$, 41.5%). Five YHC nurses did not complete the questionnaire, which led to missing data on competency scores. YHC nurses reported higher scores on the following competencies: Caregiver, Communicator, Collaborator and Leader; lower scores were reported on Health Advocate, Scholar and Professional.

Characteristics related to YHC nurses' discussion for optional e-consults with parents

Results of the univariate analysis of YHC nurses' discussion for optional e-consults with parents are listed in Supplemental Table S1. Significantly related variables were:

Employment status of the parent 1: $t(1) = 5.533, p = .019, n = 690$; nurses discussed e-consults more often with employed parents, adjusted standardized residuals (ASR) $z = 2.4$.

Nationality of parent 2: $t(1) = 6.628, p = .010, n = 683$; nurses discussed e-consults more often with Dutch parents, ASR $z = 2.6$.

The YHC nurse's years of working experience: $t(4) = 13.155, p = .011, n = 433$; nurses with 0–3 years of working experience discussed e-consults less often with parents, ASR $z = -3.6$.

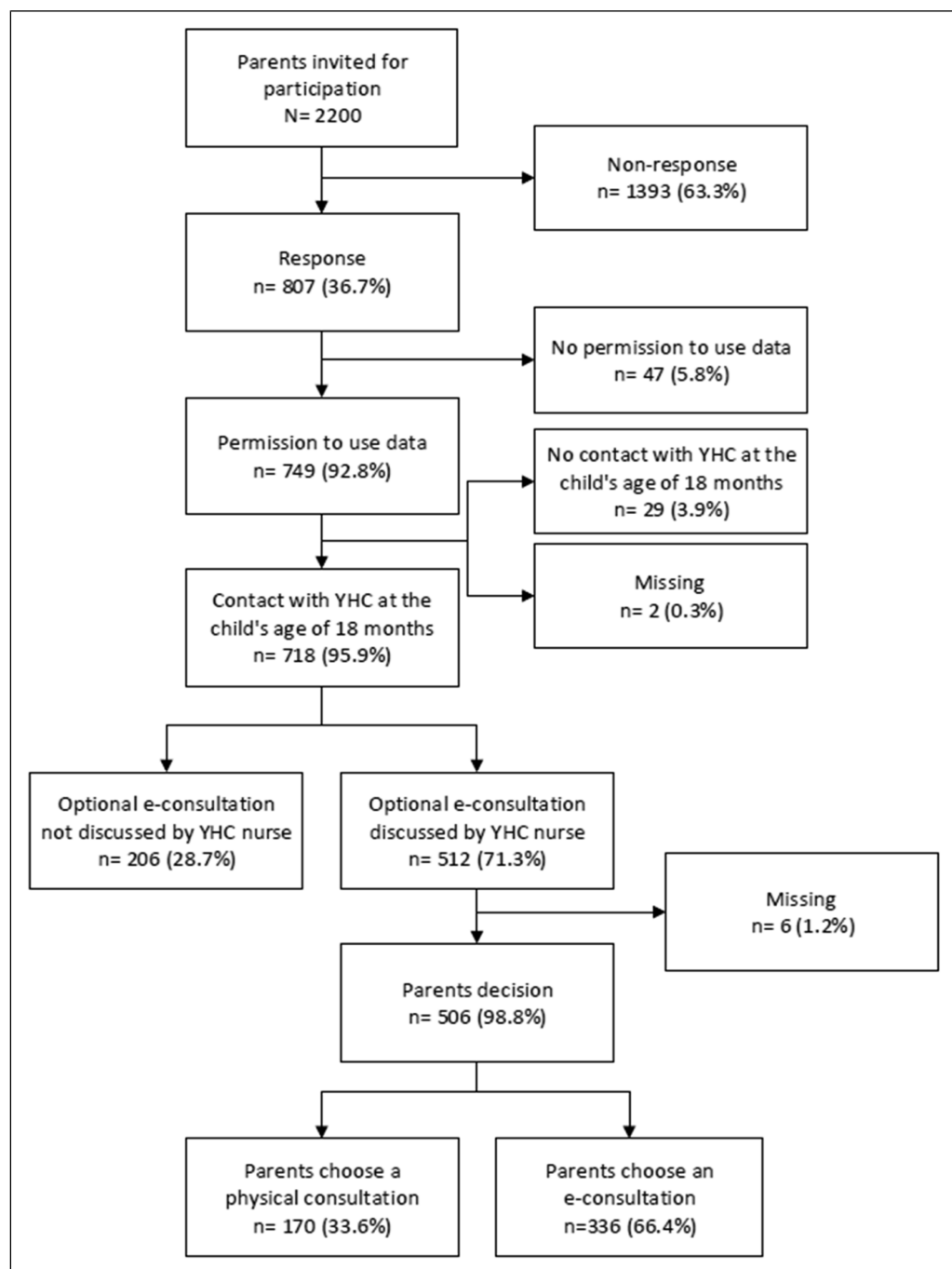


Figure 1. Flowchart parents decision.

Table 1. Characteristics of included low risk families.

Characteristics	Mean (SD) n(%)
Age parent 1 (n = 697)	31.69 (4.39)
Educational status parent 1	
Low	73 (10.2)
Intermediate	294 (40.9)
High	319 (44.4)
Missing	32 (4.5)
Educational status parent 2	
Low	104 (14.5)
Intermediate	363 (50.6)
High	213 (29.7)
Missing	38 (5.3)
Employment status parent 1	
Employed	602 (83.8)
Unemployed/voluntary work/disabled/stay-at-home-parent	88 (12.3)
Missing	28 (3.9)
Nationality parent 1	
Dutch	655 (91.2)
Non-Dutch	35 (4.9)
Missing	28 (3.9)
Nationality parent 2	
Dutch	648 (90.3)
Non-Dutch	35 (4.9)
Missing	35 (4.9)
Number of children	
1	274 (38.2)
2	290 (40.4)
3	85 (11.8)
>3	41 (5.7)
Missing	28 (3.9)

Of the 718 cases, 403 (56.1%) were complete and included in the GLMM analysis. [Table 3](#) presents the results of the GLMM variables related to the YHC nurses' discussion for optional e-consults. The GLMM, which takes into account clustering of parents by YHC nurses, shows that working experience between 0 and 3 years is the only variable related to the decision of nurses to discuss the optional e-consults with parents, $B = 1.866$, $SE = 0.5860$, 95% CI (0.714, 3.018). In contrast to the outcome of the univariate analysis, the GLMM shows that YHC nurses with 0–3 years of working (who saw 70 parents) experience more often discussed e-consults with parents. Parent characteristics had no significant influence on the discussion for optional e-consults between YHC nurses and parents. Because of the high number of missing data for YHC nurses, the chi-square statistic for the missing group category of nurses versus the known group category on the dependent variable 'Has the YHC nurse discussed the optional e-consults with you' was tested. This test indicated that in this study the missing group of YHC nurses ($n = 285$) did not significantly

Table 2. Characteristics of included YHC nurses.

Characteristics YHC nurses (n = 36)	Mean (SD)
Competence Caregiver	3.59 (0.33)
Competence Communicator	3.3148 (0.43)
Competence Collaborator	3.1944 (0.06)
Competence Leader	3.6944 (0.44)
Competence Health Advocate	2.9722 (0.43)
Competence Scholar	2.5370 (0.67)
Competence Professional	2.4653 (0.67)
	n(%)
Educational status	
Bachelor	16 (39.0)
Post bachelor or master	25 (61.0)
Years working experience	
0–3	5 (12.2)
3–6	5 (12.2)
6–10	2 (4.9)
10–15	9 (22.0)
>20	20 (48.8)
Working hours per week	
16–24	11 (26.8)
24–32	18 (43.9)
>32	12 (29.3)

differ from non-missing YHC nurses (n = 433) ($\chi^2 (1) = 1.487$ $p = .223$). Therefore, it seems plausible that the missing data for YHC nurses have little impact on the GLMM results.

Characteristics related to parents' decision to use e-consults

The most frequently mentioned reasons by the 336 parents who decided to use e-consults were: if everything goes well, it is a good alternative (n = 245, 72.9%); I can do it at a time that suits me (n = 157, 46.7%); it saves a visit to YHC center (n = 148, 44.0%). The main reasons for the 170 parents who decided not to use e-consults were: I want direct contact with the nurse (n = 96, 56.5%), and I want to weigh and measure my child during a consultation (n = 89, 52.4%).

Characteristics of the parent groups (non-users and users of e-consults) were the same as the parent characteristics described in Table 1, p-values were between .510 and .981. Results of the chi-square test are listed in Supplemental Table S2. Univariate analysis showed that the independent variable 'years of working experience of the YHC nurses ($\chi^2 (4) = 10.450$, $p = .033$, n = 312) was significantly associated with the dependent variable 'parents have decided to use the e-consults'. Nurses with

3–6 years of working experience had significantly more parents who decided to use e-consults, ASR $z = 2.1$.

6–10 years of working experience had significantly more parents who decided not to use e-consults, ASR $z = -2.0$.

Table 3. Variables related to discussing e-consults with parents by YHC nurses.

Fixed variables	Coefficient	SE	t	95% CI	Exp (Coefficient)	95% CI for Exp (Coefficient)
Education level YHC nurses Bachelor of nursing	-2.300	18.901	-1.217	-6.016 to 1.416	0.100	0.002 to 4.121
Education level YHC nurses Post bachelor or master	-1.475	18.564	-0.795	-5.125 to 2.175	0.229	0.006 to 8.799
Competence Caregiver	-0.475	0.5422	-0.875	-1.541 to 0.591	0.622	0.214 to 1.806
Competence Communicator	0.676	0.5354	1.263	-0.376 to 1.729	1.967	0.686 to 5.634
Competence Collaborator	0.216	0.4303	0.502	-0.630 to 1.062	1.241	0.533 to 2.892
Competence Leader	0.426	0.3670	1.161	-0.295 to 1.148	1.532	0.744 to 3.151
Competence Health Advocate	0.257	0.4056	0.634	-0.540 to 1.055	1.293	0.583 to 2.871
Competence Scholar	-0.498	0.3052	-1.633	-1.099 to 0.102	0.607	0.333 to 1.107
Competence Professional	-0.516	0.3576	-1.442	-1.219 to 0.187	0.597	0.296 to 1.206
Working experience in years (reference >20)						
0-3	1.866	0.5860	3.184	0.714 to 3.018	6.462	2.042 to 20.451
3-6	0.818	0.6742	1.213	-0.508 to 2.143	2.265	0.602 to 8.526
6-10	0.817	0.7009	1.166	-0.561 to 2.195	2.264	0.571 to 8.983
10-20	-0.207	0.3833	-0.540	-0.960 to 0.547	0.813	0.383 to 1.727
Working hours/week (reference >32)						
16-24	0.163	0.3708	0.438	-0.567 to 0.892	1.177	0.568 to 2.439
24-32	-0.317	0.3701	-0.857	-1.045 to 0.411	0.728	0.352 to 1.508

The GLMM analysis included 291 (57.5%) complete cases. [Table 4](#) presents the results of GLMM variables related to the decision of parents to use e-consults. Taking clustering into account, the results show a significant relationship between the decision of parents to use e-consults and:

3-6 years of working experience of the YHC nurses, $B = -1.888$, $SE = 0.8022$, 95% CI (-3.468, -0.309).

YHC nurses' score on the competence of Collaborator, $B = -1.165$, $SE = 0.5382$, 95% CI (-2.225, -0.106).

Table 4. Variables related to parents' decision for e-consults.

Fixed variables	Coefficient	SE	t	95% CI	Exp (Coefficient)	95% CI for Exp (Coefficient)
Competence Caregiver	-0.818	0.5910	-1.384	-1.981 to 0.345	0.441	0.138 to 1.413
Competence Communicator	0.421	0.5906	0.713	-0.742 to 1.584	1.524	0.476 to 4.874
Competence Collaborator	-1.165	0.5382	-2.165	-2.225 to 0.106	0.312	0.108 to 0.900
Competence Leader	0.455	0.4264	1.068	-0.384 to 1.295	1.577	0.681 to 3.650
Competence Health Advocate	0.407	0.5313	0.766	-0.639 to 1.453	1.502	0.528 to 4.275
Competence Scholar	-0.131	0.3210	-0.407	-0.763 to 0.501	0.878	0.466 to 1.651
Competence Professional	0.256	0.4050	0.633	-0.541 to 1.054	1.292	0.582 to 2.868
Education level YHC nurses Bachelor of nursing	1.373	20.112	0.683	-2.586 to 5.333	3.949	0.075 to 206.980
Education level YHC nurses Post bachelor or master	1.271	20.252	0.628	-2.716 to 5.258	3.564	0.066 to 192.041
Working experience in years (reference >20)						
0-3	-0.288	0.6786	-0.425	-1.624 to 1.047	0.749	0.197 to 2.850
3-6	-1.888	0.8022	-2.354	-3.468 to 0.309	0.151	0.031 to 0.734
6-10	0.774	0.7748	0.998	-0.752 to 2.299	2.167	0.472 to 9.962
10-20	-0.342	0.4485	-0.762	-1.225 to 0.541	0.711	0.294 to 1.718
Working hours/week (reference >32)						
16-24	-0.021	0.4651	-0.045	-0.937 to 0.895	0.979	0.392 to 2.446
24-32	0.096	0.4164	0.230	-0.724 to 0.915	1.100	0.485 to 2.498

The negative B-coefficient means that, in contrast to the outcome of the univariate analysis, the GLMM shows that parents more often decided not to use the e-consults when the nurse had 3–6 years of working experience and a higher competency score for Collaborator.

Due to the high number of missing data for nurses, the chi-square statistic for the missing group of nurses versus the outcome variable 'use of e-consults by parents' was tested. This test indicated that the missing group ($n = 195$) significantly differed from non-missing nurses ($n = 312$) in this study ($\chi^2(1) = 8.649$, $p = .003$). The GLMM results with the missing group ($n = 467$), included by an 'unknown' category for the nursing variables, also showed that the use of e-consults by parents was

lower among YHC nurses with 3–6 years work experience ($B = -1.856$, $SE = 0.8$, $p = 0.021$) and a higher competence score for Collaborator ($B = -1.152$, $SE = 0.5354$, $p = 0.032$). Therefore, it seems plausible that the missing data for YHC nurses had little impact on the GLMM results.

Discussion

This study aimed to identify the factors associated with the decision of parents to use e-consults within the context of preventive Youth Health Care. Parental characteristics examined in this study were not significantly associated with parents' decision to use e-consults, whereas characteristics of YHC nurses were. The full potential of e-consults in YHC is higher than observed in this study because the option of e-consults was not discussed with 206 (28.7%) parents. Using e-consults for families at low risk of parenting and developmental problems is not a goal in itself, but optional services to provide personalized care. We know nurses do consider the input of patient preferences as vital to their own decision-making in order to ensure personalized care (Den Hertog and Niessen, 2021). However, nurses may unintentionally influence decision-making by withholding information, thereby limiting parents' ability to make an informed choice.

Most parents ($n = 245$, 72.9%), decided to use e-consults because it is a good alternative, if everything goes well. The main reason for parents not to use e-consults is they wanted direct contact with their YHC nurse ($n = 96$, 56.5%). The fact that parents take into account their preference to physically meet with the YHC nurse when deciding on the use of e-consults is relevant knowledge for YHC nurses. In general nurses have a less positive view of digital health interventions than of common nursing activities with physical contact (Van Houwelingen et al., 2017). It might be in contrast to nurses' professional expectations, and their fear of losing personal contact may impede their willingness to adopt such digital health interventions (Van Houwelingen et al., 2017).

Results showed that the working experience of the YHC nurses (0–3 years) was related to more frequent discussions about optional e-consults with parents. In general, 0–3 years of working experience may be related to a younger nurse, but data on nurses' ages were not collected in this study. It is also debatable whether age plays a role, because it is known the 'Internet-generation' nursing students (year of birth 1992–2000) do not have a more positive view of e-health activities than their fellow nursing students born earlier (Van Houwelingen et al., 2017). Three years before the start of this study, e-consults were implemented within the organization in this study. So nurses with 0–3 years working experience may consider e-consults to be the norm. In contrast, nurses with longer work experience may find it more challenging to shift from established routines to new ways of working, depending of the individual stage of change (Ross et al., 2016). Additionally, deviating from standard working agreements requires nursing leadership in daily practices, and nursing leadership also requires work experience, among other qualities (Kok et al., 2023). Therefore, more developed leadership qualities, may help explain why nurses with more work experience discuss optional e-consults less frequent. They may consciously deviate from the (new) norm when they deem it appropriate, without always discussing this with parents.

Parents more often decided not to use e-consults when discussing it with YHC nurses with 3–6 years work-experience. In informal networks, parents prefer information and advice from peers who went through the same situation (Price et al., 2018). Shared life stage and age proximity between parents and nurses may have influenced the decision of parents not to opt for e-consults. Previous research suggests that trust and rapport are facilitated when YHC professionals relate to parents as peers by drawing upon their own parental experiences and concerns and embedding cultural sensitivity within their daily practices (Boelsma et al., 2021). Therefore, parents may value

in-person contact with them more highly, as they may perceive these YHC nurses as better able to draw on lived experience with early parenting.

Another finding showed that parents more often decided not to use e-consults when discussing it with YHC nurses with a higher competence score for Collaborator. Collaboration may be associated with being psychically together or with synchronous contact moments to coordinate support for parents and families. If YHC nurses consider themselves a good Collaborator, they may experience fewer opportunities to use their talents when parents use e-consults. Another study found YHC nurses' ability to support client-led decision-making appears to depend on the level of established trust and the strength of the nurse–client relationship as well as on the willingness to share power in decision-making with the family, or professional humility (Kanda et al., 2023). The sense of influence on collaboration is likely to decrease when parents use e-consults and may impact conversations between parents and YHC nurses about the possibility of using e-consults.

Strengths and limitations

Limitations of this study are the missing data from parents and YHC nurses; 36.7% of the parents responded to the questionnaires and 51.3% of the nurses. Another limitation is the amount of missing values of nursing data. By performing additional analyses, the validity of the results did increase. The population characteristics of the low risk group in this study were similar to the population characteristics of the low risk group in previous YHC studies (Van Stel et al., 2012), indicating that the low risk group is a representative group. However, due to the small sample size in this study, the results are not generalizable.

In addition, file data did not include information about discussing the optional e-consults with parents, so this information was obtained from the survey. Confirmation bias may have occurred, because this is a type of cognitive bias. It is possible that parents did not remember the discussion about e-consults during the 18-months consultation. This risk of confirmation bias can result in higher rates of parents who did not remember the discussion with nurses, thereby influencing the analysis of characteristics which were related to the nurses' decision.

A strength of this study is that both nurse and parent data were included and an analysis was conducted that took into account clustering. Our findings demonstrate Simpson's paradox (Simpson, 1951): The results of the univariate analyses and GLMM show an reverse effect. This underscores the importance of accounting for clustering to avoid misleading conclusions.

Implications for practice

Parental characteristics, assessed in this study are less influential in decision-making than the characteristics of the nurses. In applied settings, including healthcare, years of working experience has been shown to shape perceptions of usefulness and ease of use of technologies (Coffetti et al., 2023; Holden and Karsh, 2010; Sun et al., 2020). Therefore, implementation strategies should first emphasize the clinical and practical value of the technology for experienced nurses by explicitly linking use to improvements in efficiency and care quality (Davis et al., 1989). To gain insight into quality of care (child outcomes) and efficiency (nurses' time investment) an effect study is recommended to assess whether e-consults can effectively and safely monitor children's development. Such studies provide broader evidence on digital health interventions in YHC for developmental monitoring parenting support, health promotion and prevention for children and their families (Brunekreeft-Budding et al., 2025; Howland et al., 2025).

Second, technologies should be integrated into existing workflows to reduce perceived effort and disruption of established routines (Venkatesh and Davis, 2000). In addition, involving experienced nurses as co-designers or peer champions may increase social legitimacy and acceptance (Venkatesh and Davis, 2000). Finally, ongoing feedback and adaptive support should be embedded to allow iterative refinement and long-term integration into routine practice (Coffetti et al., 2023; Venkatesh and Davis, 2000).

Third, future research should adopt a more differentiated approach by focusing on specific subgroups within migrant populations although the current sample consisted predominantly of parents with Dutch nationality. Intention to use e-consults appears to vary across characteristics such as generation status, literacy levels and understanding of the healthcare professional (Hengst et al., 2023).

Conclusion

This study highlights the pivotal role that YHC nurses play in the decision of parents to use e-consults. The decision to use e-consults does not solely depend on parental need or preference, but is significantly influenced by how nurses present and discuss this option. These findings underscore the importance of implementation strategies for nurses, with attention to the change in the profession and the nurses' role when using e-consults in practice.

In conclusion, this study illustrates the importance of including multiple perspectives, including the health professionals and parents in research, when examining the implementation of person-centered digital health interventions in YHC.

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Ethical considerations

The study was assessed by the Medical Research Ethics Committee at the University Medical Center of Utrecht (nr 18/237) and was considered not subject to the Dutch Medical Research Involving Human Subjects Act. This study was conducted in compliance with the European Code of Conduct for Research Integrity (2017).

Consent to participate

All participants provided digital informed consent before taking part in the study.

Consent for publication

Informed consent was provided by the participants.

Author contributions

Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data: AB, IS, NV, WK, ES, GW

Involved in drafting the manuscript or revising it critically for important intellectual content: AB, IS, NV, WK, ES, GW

Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content: AB, IS, NV, WK, ES, GW

Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: AB, IS, NV, WK, ES, GW.

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The data are available from the corresponding author on reasonable request.

Supplemental material

Supplemental material for this article is available online.

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