Original Research Article

Evaluating Existing Mobile Apps for Toddler Parenting: Recommendations forFuture AppDevelopers

Abstract:

Background: As the number of smartphones in use rises, more parents are turning to mobile applications for parenting guidance. However, identifying quality apps for guidance on child development can be challenging for parents.

Objective: This study evaluated existing mobile applications to disseminate important parenting information among Indian parents using a structured analysis method.

Methodology: This app analysis study aimed to document the basic and special features of toddler parenting apps in India available to parents as they promote their child's development and health. To understand the accessibility and quality of apps for toddler parents, we conducted an analysis of apps in the Google Play Store. The Google Play Store was searched for available parenting apps using different search terms such as mom, mother, mommy, father, dad, papa, daddy, baby, kid, toddler, child, children, parent, and parenting. We screened 138 apps and evaluated 40 that met the criteria for their features and usability

Results: We found that a great number of toddler parenting apps are available, but most of the apps had foreign regions of origin (50%). The information is in English language (65%)and the apps are mostly non-interactive (60%).

Conclusion: The study addresses a crucial gap in the availability and quality of mobile applications tailored for toddler parenting, specifically in the Indian context. By evaluating and highlighting the shortcomings of existing apps, the study provides valuable insights that can inform the development of more effective, culturally relevant, and interactive parenting tools. The findings also emphasize the need for localized content, which is vital for enhancing parenting practices and child development.

Keywords: smartphone, mobile application, toddler, parenting, non-interactive

Introduction

A toddler is a child approximately 12 to 36 months old[1]. According to the Cambridge dictionary, a toddler is a young child, especially one who is learning or has recently learned to walk. The word "toddle" comes from the verb "to walk unsteadily, as a child of this age might." Toddlers go through constant growth and development changes. Piaget's theory links toddlerhood

to the sensory preoperational phase, Freud to the anal stage, and Erickson views it as the time to vacillate between feelings of autonomy vs. shame and doubt[2]. The term parenting has been defined as the process or the state of being a parent, and includes nourishing, protecting, and guiding a child through the course of development[3].

Earlier we had joint families where elders helped the young parents in child care. They also used to teach parenting side by side by giving practical advices while actively participating in rearing of the baby. But as we have shifted from joint to nuclear families, the traditional parenting support and services are typically unreachable. The natural teaching-learning process is absent, therefore, parenting has become extra challenging for young parents.

With technology fast becoming a vital part of people's lives, parenting has also experienced a deep change recently. Now-a-days mobile applications have been seen as the most effective, current, and powerful technologies, and this is due to the widespread use of mobile devices. Moreover, the raising power of mobile devices has a great effect on people of all ages; and more specifically on social relationships, including interaction between parents and child. Parenting apps are assisting couples raise their offspring in a much more effective and secure way[4].

The widespread usage of apps makes it an appropriate platform to help parents in their parenting[5]. However, the proliferation of low-quality applications presents challenges for parents in properly employing apps. According to Bhandari *et al.* (6), parents' first perceptions of an app's quality are influenced by its design, which can either strongly encourage or discourage parents from downloading it. Furthermore, parents preferred some app features over others. So the present study was conducted to analyze the various existing toddler parenting apps to help the Indian parents to locate the best parenting app for their parenting purpose.This study aims to address the challenge faced by Indian parents in finding quality toddler parenting apps by evaluating the features and accessibility of existing apps. The objective is to provide insights into the availability and quality of these apps to guide future app development.

Material and method

We finished analysis of applications in the Google Play store to determine the quality and availability of apps for parents of toddlers. The selection criteria included apps that were free to download, targeted toddler parents, and had a minimum user rating of 3.0 on the Google Play Store.The Google Play Store was searched for available parenting apps using different search terms such as mom, mommy, mother, father, dad, daddy, papa, toddler, kid, child, children, family, parent, and parenting. A total of 138 apps were screened, and 40 toddler parenting apps that met the selection criteria were downloaded and installed on an Android phone. Each app was analyzed for basic features such as updates, reviews, downloads, and special features like interactivity and

language options using a structured schedule

The questionnaire had two sections, A and B, which dealt with analysis of the app's basic and special features, respectively.

- Section A (App's basic features) had a total 12 items
- Section B (App's special features) had a total of 10items

The collected data were classified and tabulated to draw meaningful inferences as per the objectives. For interpretation of results, frequency and percentage descriptive statistics were used.

Results: Theresultsofthepresentstudyhavebeenpresentedunderfollowingheadsandsub-heads:

1.1. Analysisofexistingtoddler parentingapps

1.1.1 Featuresoftoddlerparentingapps

1.1.1.1 Basicfeaturesoftoddler parentingapps

1.1.1.2 Specialfeaturesoftoddler parentingapps

1.1.1 Featuresoftoddler parentingapps

In this section, basic, special, interactive, and use & share features of various toddler parentingapps have beendescribed.

1.1.1.1 Basicfeaturesoftoddler parentingapps

Basic features of toddler parenting apps like the last update, number of reviews, number of downloads, Google Play Store rating, region of origin, version type, affiliation, app permissions, app working mode, payment, and language were assessed.

The basic features of toddler parenting apps have been presented in Table 1. The results showed that most apps (72.5%) were updated within the last year, indicating active maintenance.

Apps had varying levels of user engagement; with 65% having up to 1k reviews and 60% having up to 100k downloads.

Maximum apps had Google Play Store ratings ranging from 4.1 to 5.0 (67.5%) and from 3.1 to 4.0 (32.5%), but none of the apps had ratings between 1.0 to 2.0 and 2.1 to 3.1. Half of the apps were foreign (50.0%), highlighting a lack of localized content. On the first download, the majority (92.5%) of apps were available for the user with a full version, while only 7.5 percent of apps offered a trial version. Out of 40 toddler parenting apps, nearly all the apps were affiliated with individuals (92.5%), followed by commercials (7.5%), and none of the apps were affiliated with any government or non-government organization.

The majority of the apps (70.0%) asked for specific permissions such as media, contacts, location, etc., while 15 percent required general permissions for app access, and 15 percent of the apps were freely accessible without needing any permission. The working mode of more than half of the apps (67.5%) was online, 20 percent worked in both online and offline mode, whereas a few (05.0%) worked offline.

More than half of the apps (62.5%) were exclusively free, while the remaining 37.5 percent apps had some specific paid content.

Around two-third of the apps (67.5%) were available only in a single language, while the remaining 32.5 percent of the apps were multilingual. 65 percent of apps were exclusively in English, whereas 17.5 percent were in English, Hindi, and other regional languages. A very small number of the apps were in English, Hindi, and other international languages and exclusively in Hindi, i.e., 12.5 and 5 percent, respectively.

Table1:Basicfeaturesofvarioustoddler parentingapps

N=40

Sr.No.	Basicinformation	F	%
1	**Lastupdate**		
	Within1 year	29	72.50
	1-2years	06	15.00
	morethan2 years	05	12.50
2	**No.of reviews**		
	Up to1k	26	65.00
	1k-100k	11	27.50
	Morethan100k	03	07.50
3	**No.ofdownloads**		
	Up to 100K+	24	60.00
	100K+ to500K+	11	27.50
	Morethan500K+	05	12.50
4	**Googleplay storerating**		
	1.0-2.0	00	00.00
	2.1-3.0	00	00.00
	3.1-4.0	13	32.50
	4.1-5.0	27	67.50
5	**Regionof origin**		
	Indian	18	45.00

	Foreign	20	50.00
	Unknown	02	05.00
6	**Versiontype**		
	Trialversion	03	07.50
	Fullversion	37	92.50
	Both	00	00.00
7	**Affiliation**		
	Individual	37	92.50
	Unknown	00	00.00
	Commercial	03	07.50
	Government	00	00.00
	NGO	00	00.00
8	**Apppermissions**		
	None	06	15.00
	GeneralPermissions	06	15.00
	SpecificPermissions	28	70.00
9	**Appworking mode**		
	Online	27	67.50
	Offline	05	12.50
	Both	08	20.00
10	**Apppayment**		
	Exclusivelyfree	25	62.50
	Withspecificpaidcontent	15	37.50
11	**Language**		
	Single	27	67.50
	Multilingual	13	32.50
12	**Availablelanguages**		
	English	26	65.00
	Hindi	02	05.00
	English,HindiandotherInternational	05	12.50
	English,HindiandotherRegional	07	17.50

1.1.1.2 Specialfeaturesoftoddler parentingapps

Specialfeaturesofthetoddler parentingapps,suchastargetgroup,typeofapp,andmodeofinformationprovided bythe app,were assessed.

Table2: Specialfeaturesofvarioustoddler parentingapps

N=40

Sr.No.	Appfeatures	F	%
1	**Targetgroup**		
	Infants	00	00.00
	Preschoolersand Toddlers	05	12.50
	Pregnant women, Lactatingmothersand Toddlers	09	22.50
	Toddlers	14	35.00
	Alloftheabove	12	30.00
2	**Typeofapp**		
	Growthtracker	05	12.50
	Informativeapp	09	22.50
	Multipurpose	26	65.00
3	**Modeofinformation**		
	Onlytext	04	10.00
	Text +Photos+Charts	04	10.00
	Text +Videos	03	07.50
	Text +Photos+ChartsandVideos	29	72.50
4	**Appinteraction**		
	Interactive	16	40.00
	Non-interactive	24	60.00
5	**Sign up**		
	Required	24	60.00
	Not required	16	40.00
6	**Appregistration**		
	Required	18	45.00
	Not required	16	40.00
	Optional	06	15.00
7	**Share optionon app ion**		

	Available	40	100.0
	Notavailable	00	00.00
8	**Share option under appmenu**		
	Available	36	90.00
	Notavailable	04	10.00
9	**Rewardforsharingapp**		
	Available	07	17.50
	Notavailable	33	82.50
10	**Feedbackoption**		
	Available	16	40.00
	Notavailable	24	60.00

Special features of the toddler parenting apps have been shown in Table 2. Only (35.0%) focused solely on toddlers, with the majority being multipurpose.

Results showed that more than half (65.0%) of the apps were multipurpose (growth tracker, informative, photo sharing, etc.), while 22.5 percent were informative, followed by 12.5 percent that were only growth trackers. The main purpose of growth tracking apps was to keep track of the growth of the toddler, while informative apps aimed only at providing information about toddlers.

It was observed that while 72.5%provided diverse content formats. . More than half (60.0%) of the apps were found non interactive, limiting user engagement.

More than half of the apps (60.0%) did not require any sign-up to use the app, whereas the remaining apps (40.0%) required the user to sign up before using the app. Approximately half of the apps (45.0%) require app registration, around one-third of the apps (40.0%) do not require registration, and for 15 percent of the apps, registration is optional.

It is clear from the table that 40.0 percent of apps provided open access as they did not require any registration, while the remaining apps required the user to register.

All the apps had both share options on the app icon and under the app menu. The majority of the apps (82.5%) were not offering any reward, such as coins, coupons, etc., for sharing the app. As

evident from the table, the feedback option was provided only in 40 percent of the apps, while the rest (60.0%) did not provide any feedback option.

Discussion

The results of the analysis of various toddler parenting apps revealed that most of the apps were updated within one year. More than half of the apps had number of reviews up to one thousand and number of downloads up to one hundred thousand, which means that these apps are beingusedbyagreatnumberofmothers.Virani *et al.* (7) also found that most of the apps (n=12) were updated within the last year and received 4.5 or above ratings from users. More than half of the apps had Indian origin, while the remaining apps were of unknown origin. It means a great number of Indian mothers are using these apps. Zhao *et al.* (8) discovered, in contrast to these findings, that the majority of applications were developed by commercial entities and poorly rated.

In the majority of the apps, the full version was available for the user after first download, which means the contents of the app were easily and freely accessible. Virani *et al.* (7) also revealed that mostly apps were freely available to the public on the Google Play Store. According to David *et al.* (9), 86.7% of the applications were downloaded for free, while the remaining apps required subscription and payment after the trial version. The majority of apps were individually affiliated, and only 3 apps were commercially affiliated, which puts a question mark on the credibility of the information provided through these apps. Taki *et al.* (10) discovered that one app was commercial while the majority of the applications (43/46) were non-commercial. More than half of the apps asked for specific permissions such as media, contacts, location, etc., to access the app, which raises concerns about privacy and safety of the user.

More than half of the apps provided content in online mode, which means the app was unusable without active internet. Most of the apps were exclusively free, and a few had some specific paid content like specific advice by professionals, diet plans for toddlers, etc. Davis *et al.* (11), Phillips *et al.* (12) found that the price for app content ranged from free to $4.99, and most of the parenting apps were in English only. The willingness of mothers to pay for information has also been reported by Kuo *et al.* (13) who found that mothers were willing to pay for mobile services that are going to provide professional health services for their children.

Only 35 percent of the apps were focused on the target group, i.e., toddlers. More than half of the apps were multipurpose apps in nature, while the rest were growth trackers or informative. Three-fourths of apps provided information through combinations of methods, i.e., text, photos, charts, and videos, to make the content more interesting and easy to understand. In research to evaluate current parenting apps, Davis *et al.* (11) discovered that the purpose, target audience, and topics varied. Even though every app on the list was intended for parents, some were for more targeted groups of parents.

Most of the apps were interactive; therefore, they were able to answer queries of the mothers. More than half of the apps required sign-up, and most of the apps required registration, which made

them difficult to access. The Share option was available in all the apps, and more than half of the apps did not have a feedback option, which shows that app developers were interested only in promotion but not in the improvement of the app. In contrast to these results, Samanta (12) conducted a study to develop content for parenting app for mothers of infants and found that most of the apps were non-interactive, did not require any sign up or registration, and more than half of the apps had a feedback option.

The study's findings align with Virani et al. (2019), which also noted high ratings for recently updated apps. However, unlike Zhao et al. (2017), who found commercial dominance, our study revealed a prevalence of individually affiliated apps, raising concerns about content credibility. These findings underscore the need for more interactive and locally relevant apps to better support Indian parents.

Conclusion

Use of mobile apps by women to get information on toddler parenting is on the rise. A great number of toddler parenting apps are available, but most of the apps had foreign regions of origin, were available online, and asked for specific permissions such as media, contacts, location, etc. A very small number of apps were focused on their target group and provided feedback option. This study highlights the predominance of foreign, non-interactive toddler parenting apps in English, which may not fully meet the needs of Indian parents. There is a significant need for culturally relevant, interactive apps that provide content in multiple languages and are accessible offline to better support toddler parents in India.Future research is required to help designers in this domain, especially in relation to preventing possible user burdens.

Limitations: The study analyzed a limited number of apps (40) and only those available for free, which may not represent the entire market.

Recommendations

- To make toddler parenting apps relevant for a wider audience, material should be available in multiple languages.
- Toddler parenting apps should be interactive so they allow moms to ask professionals questions and receive expert responses.
- To make it easy to use and comprehend for the average Indian mother, toddler parenting apps should have a light and basic design.
- The toddler parenting app should also be capable of operating offline.

Disclaimer (Artificial intelligence)

Option 1: NO generative AI technologies and text-to-image generators have been used during writing

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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Details of the AI usage are given below:

1.

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3.

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