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### Quality of mobile apps for toddler parenting: Search in google play store and content analysis

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#### Abstract

In this digital era, first-time parents actively use smartphone programs, or "apps," to help them adapt to their new roles as parenting tasks may be difficult. These days, tech-savvy parents use apps to do a lot of things, like obtaining information, monitoring their child's growth, editing and sharing images, and much more. The main aim of the present study was to analyze the content of various available toddler parenting apps and to assess the need for apps for mothers of toddlers. We studied two types of samples: digital and human. The digital sample comprised of 40 toddler parenting apps available for free download on the Google Play Store. The human sample consisted of 120 mothers of 2-4-year-old children. These mothers were selected from Hisar city in Haryana state. The women were approached through the OPD of two hospitals in the city. The results of the study revealed that the majority of the apps did not have information on various aspects of toddler parenting, such as growth and development, toddler health, and nutrition, whereas the majority of the respondents felt strong need for information on these aspects. All the respondents expressed a need for a toddler parenting app covering all the aspects. So, the relevant government agency should develop a toddler parenting app of their own for toddler's mothers that provides information on all aspects of toddler parenting.

**Keywords:** Growth, development, nutrition, a toddler parenting, content, need

#### Introduction

Parenting is at its greatest level of strength during toddlerhood, as in the first few years of life, children depend exclusively on their caregivers, who determine most of the children's experiences (Molly, 2017) <sup>[1]</sup>. According to Fitzgerald (2021) <sup>[2]</sup>, toddler years, which are marked by significant developmental milestones, are one of the most challenging for parents. Toddlerhood is a period of not only enormous physical growth but also rapid brain development, with one million new neural networks form every second during which social experience (e.g., parent-child interactions) influences the structure and function of an infant's brain, helping lay the foundation for future welfare. Thus, the risks of parenting during this period are high for children, families, and society (Fox *et al.*, 2010; Easterbrooks *et al.*, 2012) <sup>[3, 4]</sup>. The mother's awareness about child care influences the nature and quality of care that is given to the child. Although all mothers are aware of their duties, it can become easier for mothers if they know their roles and responsibilities thoroughly (Kamau *et al.*, 2002) <sup>[5]</sup>. Women use technology (such as Google and smartphone apps) to make up for knowledge gaps (Kraschnewski *et al.* 2014) <sup>[6]</sup>.

Several academic studies have demonstrated that many women find parenting apps to be useful sources of information and support. These applications are valuable because they offer information in a handy format and are

easily accessible on users' mobile devices (Lupton and Pedersen 2016) <sup>[7]</sup>. Hence, there is a strong need for an app for toddler parents. Parenting App helps mothers to manage childrearing, giving them a variety of recordkeeping, scheduling, and communication tools that can help them to save all of their baby's critical information, such as appointments and expenses (Jewell, 2020) <sup>[8]</sup>. An app for toddlers with the aim to support and facilitate parents in observing the process of developing toddlers will make it easier for parents to get knowledge about wellbeing in toddlers (Syahputri *et al.*, 2019) <sup>[9]</sup>.

So we conducted this study to assist parents in identifying an appropriate app for their parenting needs by analyzing the content of various toddler parenting apps.

#### Objectives of investigation

1. To analyze the content of various available toddler parenting apps
2. To assess the need for an app for mothers of toddlers

#### Materials and Methods

Two types of samples were studied for the present investigation, i.e., digital sample and human sample. The digital sample of the study comprised of 40 toddler parenting apps available for free download on the Google Play Store, which were analyzed for their content. The human sample of the study comprised of 120 mothers of 2-

4-year-old children. Mothers who had at least one child aged 2-4 years were selected because they had recent experience with toddler care practices and it was easier for them to recall their experiences.

To select the study sample, the mothers visiting the OPD of two healthcare centers in District Hisar, viz., Maharaja Agarsain Medical College (Agroha, Hisar) and Satija Health Care Center (Hisar), were approached personally. From these mothers, those fulfilling the above criteria were explained the purpose of the study, and their verbal consent for participation was sought. Those who agreed to participate were selected purposefully.

**Tools for data collection**

- A self-structured schedule was used to analyze various toddler parenting apps. The questionnaire had three sections A, B, and C, which dealt with the analysis of information on toddler development, information on toddler health, and information on toddler nutrition. It had total 31
- On the basis of an analysis of 40 toddler parenting apps and expert opinion, an interview schedule was prepared to assess the needs of Indian mothers for toddler parenting apps. This section had three sub-sections, i.e., the socio-personal background of the respondents, growth and development, toddler health, and nutrition.

**Results**

The results of the present study have been presented under the following heads and sub-heads:

**Contents of toddler parenting apps**

- Information on toddler development
- Information on toddler health and nutrition

**Analysis of various toddler parenting apps**

This section deals with a detailed analysis of 40 toddler parenting apps that were available for free download on the Google Play Store. The analysis was conducted with regard to:

**Contents of toddler parenting apps**

Under this section, the type of information available within various apps has been categorized and described.

**Information on toddler development**

**Table 1:** Availability of information on toddler development N=40

Growth aspects	Yes		No	
	F	%	F	%
Physical growth	30	75.00	10	25.00
Speech development	28	70.00	12	30.00
Cognitive development	28	70.00	12	30.00
Social development	30	75.00	10	25.00
Emotional development	30	75.00	10	25.00
Baby self-care skills	16	40.00	24	60.00
Developmental tasks	29	72.50	11	27.50
Developmental milestones tracker	22	55.00	18	45.00
Learning problem	18	45.00	22	55.00
Baby exercise and activities	30	75.00	10	25.00

The results of the toddler development information have been depicted in Table 1. It was observed that the majority (75%) of the apps provided information on physical growth, social development, emotional development, and baby exercise and activities. As the table shows, 72.5 percent of the apps provided information on a child's developmental tasks. 70 percent of the apps provided information on speech and cognitive development, while around half of the apps provided information on baby self-care skills (40%) and learning problems (45%) and had developmental milestone trackers (55%).

**Information on toddler health and nutrition**

**Table 2:** Availability of information on toddler health N=40

Health Aspects	Yes		No	
	F	%	F	%
Cold and cough remedies	22	55.00	18	45.00
Teeth problems	21	52.50	19	47.50
Eye problems	17	42.50	23	57.50
Ear problems	07	17.50	33	82.50
Stomach problems	18	45.00	22	55.00
Food allergies	18	45.00	22	55.00
Skin problems	20	50.00	20	50.00
Child immunity	22	55.00	18	45.00
Baby vaccination chart	16	40.00	24	48.00
Child yoga	19	47.50	21	52.50
First aid	09	22.50	31	77.50
Dadi home remedies	20	50.00	20	50.00
Doctor's advice	20	50.00	20	50.00
Medication reminder	16	40.00	24	48.00

The results of the information regarding toddler health have been depicted in Table 2. According to the above results, around half of the apps provide information on health aspects such as cold and cough remedies (55.0%), child immunity (55.0%), teeth problems (52.0%), skin problems (50.0%), doctor advice (50.0%), and Dadi home remedies (50.0%). Three-fourths of the apps did not provide information on first aid (77.5%), while more than half of the apps did not provide information on eye problems (57.5%), food allergies and stomach problems (55.0%), or child yoga (52.5%). The majority of the apps did not provide information on ear problems (82.5%). Even a number of the apps did not have facilities like medication reminders and baby vaccination charts (48.0%).

**Table 3:** Availability of information on toddler nutrition N=40

Nutritional aspects	Yes		No	
	F	%	F	%
Breastfeeding	24	60.00	16	40.00
Bottle feeding	24	60.00	16	40.00
Tips to introduce new food	24	60.00	16	40.00
Nutrition information	19	47.50	21	52.50
Food chart for babies	19	47.50	21	52.50
Baby snacks and meal recipes	24	60.00	16	40.00
Tiffin ideas	17	42.50	23	57.50

The results of the information regarding toddler nutrition have been portrayed in Table 3. The results illustrate that more than half of the apps provided information on nutrition aspects of breastfeeding (60.0%), bottle feeding (60.0%), tips to introduce new foods (60.0%), snacks, and meal

recipes (60.0%). But at the same time, they did not provide information on nutrition aspects such as tiffin ideas (57.5%), nutrition information (52.5%), and facilities like food charts for babies (52.5%).

**Need assessment for the toddler app**

Under this section, the results related to the need assessment

of parents for the toddler parenting app have been presented.

**Need for knowledge on the growth and development of the toddler**

Under this section, growth and development of the toddler were assessed.

**Table 4:** Need for knowledge on the growth and development of the toddler N=120

Growth aspects	Very much needed		Somewhat needed		Not needed	
	F	%	F	%	F	%
Physical development	110	91.67	10	08.33	0	00.00
Motor development	106	88.33	14	11.67	0	00.00
Mental development	116	96.67	04	03.33	0	00.00
Language development	106	88.33	14	11.67	0	00.00
Social development	112	93.33	08	06.67	0	00.00
Emotional development	110	91.67	10	08.33	0	00.00
Baby self-care skills	108	90.00	12	10.00	0	00.00
Ways to promote various developments	106	88.33	14	11.67	0	00.00

The need for knowledge on the growth and development of the toddler has been presented in Table 4. As the table shows, the majority of women felt very much needed to have information on mental development (96.67%), social development (93.33%), and physical as well as emotional development (91.67%). An equal number of respondents needed to have information on motor development,

language development, and ways to promote various developments (88.33%).

**Need for knowledge on toddler health and nutrition**

Under this section, toddler health care and toddler nutrition were assessed.

**Table 5:** Need for knowledge on toddler health care N=120

Health Aspects	Very much needed		Somewhat needed		Not needed	
	F	%	F	%	F	%
Common cold and cough	109	90.83	11	09.17	0	00.00
Stomach problem	101	84.17	19	15.83	0	00.00
Teeth problem	108	90.00	12	10.00	0	00.00
Vaccination	107	89.17	13	10.83	0	00.00
Immunity boosting	104	86.67	16	13.33	0	00.00

The need for knowledge on toddler health care has been described in Table 5. According to the results, the majority of respondents felt too much need regarding the common

cold and cough (90.83%), teeth problems (90.0%), vaccination (89.17%), child immunity (86.67%), and stomach problems (84.17%).

**Table 6:** Need for knowledge on toddler nutrition N=120

Nutritional aspects	Very much needed		Somewhat needed		Not needed	
	F	%	F	%	F	%
Bottle feeding	98	81.67	20	16.67	12	10.00
Complementary feeding (6 to 24month)	107	80.83	08	06.67	05	04.17
Diet plan	108	90.00	09	07.50	03	02.50
Tiffin Ideas	80	66.67	33	27.50	07	05.83

The need for knowledge on toddler nutrition has been presented in Table 6. The result shows that the majority of respondents felt very much needed regarding aspects of toddler nutrition like diet plan (90.0%), bottle feeding (81.67%), complementary feeding, and weaning (80.830%). On the other hand, more than half (66.67%) of the respondents found it very much needed to have information on Tiffin Ideas.

toddlers. This lack of awareness is about all aspects of growth. They do not have knowledge on physical, motor, cognitive, social, and emotional development and developmental milestones of children (Aldayel *et al.*, 2020; Karuppanan *et al.*, 2020) <sup>[10, 11]</sup>. In the present study also mothers felt very much need for information on the physical, motor, cognitive, language, social, and emotional development of toddlers. A large number of the existing analyzed apps have content on these aspects, but that content was not sufficient. So, these apps are not suitable to fulfill the need of Indian mothers. These findings get support from the study carried out by Rehman *et al.* (2016) <sup>[12]</sup>, who found that formal education, television, radio,

**Discussion**

**Contents of existing parenting apps and needs of toddler mothers**

**A. Growth and development of toddlers**

Mothers usually lack knowledge about the growth aspects of

magazines, and discussing with a pediatrician are not available as a major source of knowledge for mothers, and knowledge of the majority of the mothers is based on informal experiences. Sharma and Dirin (2017) <sup>[13]</sup> found that information on parenting is plenty, but still the parents do not get satisfied solutions to the specific problems. Every child is unique, and every parent is different. As a result, the information provided must be categorized and customized. The information that is readily available is ample, disorganized, and difficult to comprehend and implement.

### B. Toddler health care

Respondents felt a strong need for information on health aspects such as cold and cough remedies, stomach problems, teeth problems, vaccinations, and immunity-boosting. Moms' awareness of issues relating to child health is inadequate, according to Al-Ayed (2010) <sup>[14]</sup>. Ramawat and Goswami (2018) <sup>[15]</sup> and Ali AHM *et al.* (2020) <sup>[16]</sup> assessed the knowledge about immunization amongst mothers of children below 5 years of age. As immunization is one of the most significant aspect of toddler health care, it was found that lack of awareness resulted in incomplete vaccination of toddlers. In the present study also, it was observed that most of the existing apps contained no information on these aspects, depicting that these apps were not fulfilling the needs of target users.

In contrast to the results of the present study, Bhavani (2020) <sup>[17]</sup> conducted a study to assess the knowledge, attitude, and practices of mothers regarding nutritional needs and health of under-five children. They discovered that moms possess sufficient information about vaccination, children's growth and development, good practices, and a fair attitude. But the knowledge scores regarding nutritional needs in general and during illness are very low. Mothers know very little about nutritional deficiencies in children. According to Scott *et al.* (2015) <sup>[18]</sup>, sponsors and regulators should set standards and support compliant health apps; developers, owners, and health practitioners should strive to enhance maternal and child health apps; and users need assistance determining the reliability of health apps.

### C. Toddler nutrition

The majority of the mothers said that information on various aspects of toddler nutrition, i.e., bottle feeding, complementary feeding, and diet plans, is very much needed. Berisha *et al.* (2017) <sup>[19]</sup> discovered that although moms had a high understanding of complementary feeding, their behaviors about the appropriate timing to begin supplementary feeding were lacking. Most of the apps provided information on breastfeeding, but that was not sufficient, and on the other hand, the majority of the apps were lacking in information on various nutritional aspects, so women felt very much need for this information. Hence, there is a need for a toddler parenting app that covers these nutritional aspects.

Rutvik *et al.* (2019) <sup>[20]</sup> analyzed the knowledge and attitude of mothers regarding feeding practices among children of 6 months to 2 years of age. Results showed that about 75 percent of mothers didn't know the correct type of complimentary feeding to initiate for their babies. The study highlighted knowledge gaps and practice gaps in mothers about complimentary feedings. Kumar *et al.* (2008) <sup>[21]</sup>

examined the state of knowledge on child health and evaluated the discrepancy between nursing mothers' awareness and practice levels. Results showed that knowledge regarding optimal infant and young child feeding practices was very poor; also, significant gaps between knowledge and practice were observed.

### Conclusion

A great number of toddler parenting apps are available, but these apps do not fulfil the needs of the mothers of toddlers. These apps provide information that is inadequate. The majority of the women felt a strong need for information on various aspects of toddler parenting, such as growth and development, toddler health care, and nutrition. Hence, the relevant government agency should develop a toddler parenting app of their own for mothers that provides sufficient information on all these domains, i.e., growth and development, toddler health care, and nutrition. Also, the apps for toddler parenting should only offer reliable information with a clear statement of the content's source.

### Limitations

- The content of only 40 existing toddler parenting apps has been analyzed, which is a small number in comparison to the total number of apps.
- The number of respondents was small, and they belonged to the only two cities of Haryana state. The needs of the women in other parts of the country may

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