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Parental knowledge of children's developmental milestones in Al-Ahsa, Saudi Arabia

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ABSTRACT

Background: Milestones refer to a child's typical development by a certain age. Children's development varies considerably in different countries; therefore, milestones are not fixed by specific ages and have a normal range of variation. This study aimed to determine parents' knowledge of children's developmental milestones in Al-Ahsa, Saudi Arabia. *Method:* A cross-sectional study was conducted between January and March 2022 using a pre-designed validated questionnaire among parents who were > 18 years, living in Al-Ahsa and had at least one child aged from birth to 14 years; 372 parents responded via local virtual and social media. *Result:* Of the parents, 71% and 62.9% correctly reported the age at which children typically start to crawl and walk, respectively. Meanwhile, 9.7% of mothers had a good knowledge level regarding milestones compared to 3.2% of fathers (P = 0.048). Primary information sources were internet sites (81.4%), parents/relatives (81.4%) and pediatricians or general practitioners (68.3%). *Conclusion:* Parents had poor knowledge of children's developmental milestones. Healthcare providers should ensure that parents receive accurate information about child development by educating them during routine visits.

Keywords: Development, milestone, developmental delay, motor, cognitive, language.

1. INTRODUCTION

The first years of life are a period of rapid growth and development as physical size increases; body organs mature; intellectual abilities develop; and basic physical skills, such as manipulation, talking and walking, are acquired. However, there are some differences between individual milestones in different parts of the world (Onis, 2006). Milestones refer to the typical child development at a certain age. Developmental milestones represent how a child plays, learns, talks, acts and moves. As there are variations between individuals and between different parts of the world in children's

development, milestones are not fixed by a specific age and have a normal variation range. For instance, infants at six months old know familiar faces, respond to sounds by making sounds, look at things nearby and roll over in both directions (Onis, 2006).

Parents' knowledge of their children's development plays an important role in shaping their children's social, physical, cognitive and mental health. High parental knowledge of child development and parenting practices significantly decreased reported child maltreatment three to five years later, improved behavioral problems in children and decreased maternal anxiety and depression (Coren and Barlow, 2001; Barlow et al., 2003; Britner and Reppucci, 1997). Knowledgeable parents are more capable of creating an appropriate environment for their child's emerging abilities and promoting children's healthy development (Benasich and Brooks-Gunn, 1996).

Conversely, parents with inappropriate knowledge of typical child development often overestimate the rate of their children's development, making them impatient and intolerant of their child's behavior (Cowen, 2001). In addition, knowledgeable parents could be more capable of detecting mental delays or abnormalities that could lead to earlier interventions, which play an important role in the progression of a child's health and prevention of diseases (Al-Maadadi and Ikhlef, 2014; Reich, 2005).

Few studies have assessed parental knowledge of developmental milestones in the Middle East, including in Saudi Arabia (Alkhazrajy and Aldeen, 2017; Habibi et al., 2017; Safadi et al., 2016). Considering the lack of knowledge about this field in the community, it is necessary to improve it (Al-Ayed, 2010; Aldayel et al., 2020). This study aimed to identify the level of parental knowledge about children's developmental milestones in the eastern region of Saudi Arabia.

2. MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in Al-Ahsa, Saudi Arabia using a pre-designed validated questionnaire (Alkhazrajy and Aldeen, 2017; Safadi et al., 2016). This questionnaire evaluated parental knowledge about developmental milestones among parents who met the following inclusion criteria: Age > 18 years, living in Al-Ahsa and having at least one child aged from birth to 14 years.

This study was conducted between January and March 2022. This was an open invitation for all parents who met the inclusion criteria through local virtual and social media grouping in the region. We received 372 participants. Al-Ahsa is the largest governorate in the eastern region of Saudi Arabia, with a population of approximately 1.3 million in 10 cities and 60 villages. The questionnaire included items on socio-demographic data such as knowledge; perception of milestones (physical, cognitive, social and emotional development); and associated factors such as income, level of education and age at the birth of their first child.

The collected data were then revised and coded. The data were analyzed using SPSS software version 22 (SPSS, Inc. Chicago, IL). Two-tailed tests were used for all statistical data analyses. Statistical significance was set at $p < 0.05$. The scoring parameters were measured by adding the points of correct answers, as we considered that each item was equal to one point. Parents who did not achieve 60% of the 100% were considered as having poor knowledge.

Descriptive analysis was applied for all variables, including participants' data, education level, family size and age at having the first child. In addition, children's data included their ages, gender, whether they had a child with special needs and their source of information. In addition, participants' knowledge regarding child developmental milestones was tabulated and their overall awareness was graphed. Cross tabulation 1 was used to assess the distribution of participants' knowledge level regarding developmental milestones using their data and primary source of information.

A total of 372 parents completed the questionnaires. Parents' ages ranged from 18 to 65 years, with a mean age of 43.9 ± 13.1 years. A total of 279 (75%) parents were female and 368 (98.9%) were Saudi a total of 226 (60.8%). Ethical approval was obtained from the Ethics and Research Committee of the King Fahad Hospital in Al-Ahsa. Informed consent was obtained from each respondent at the beginning of the questionnaire.

3. RESULTS

A total of 372 parents completed the questionnaires. The parents' ages ranged from 18 to 65 years, with a mean age of 43.9 ± 13.1 years. A total of 279 (75%) parents were female and 368 (98.9%) were Saudi. A total of 226 (60.8%) parents had their first child at 18–25 years and 95 (25.5%) at 25–30 years. A total of 359 (96.5%) parents were married, whereas 13 (3.5%) were divorced or widowed. A family size of 2–5 persons was reported among 207 (55.6%) parents and 6–10 among 156 (41.9%) parents. A total of 227 (61%) parents had a university education or above, 169 (45.4%) were working and 149 (40.1%) were not working. Monthly income of less than 5000 SR was reported among 121 parents (32.5%) and 128 (34.4%) had a monthly income exceeding 10000 SR. A total of 121 (32.5%) parents changed their homes only once during the last five years, while 210 (56.5%) did not change their homes (Table 1).

Table 1 Socio-demographic data of study participants

Socio-demographic data	No	%
Age (years)		
18–35	147	39.5%
36–55	192	51.6%
55+	33	8.9%
Gender		
Male	93	25.0%
Female	279	75.0%
Nationality		
Saudi	368	98.9%
Non-Saudi	4	1.1%
Age when had first child		
< 18	15	4.0%
18–25	226	60.8%
25–30	95	25.5%
30–35	27	7.3%
35–40	9	2.4%
Marital status		
Married	359	96.5%
Divorced / widow	13	3.5%
Family size		
2–5	207	55.6%
6–10	156	41.9%
> 10	9	2.4%
Qualification		
Secondary / below	145	39.0%
University / above	227	61.0%
Work		
Not working	149	40.1%
Student	20	5.4%
Working	169	45.4%
Retired	34	9.1%
Monthly income		
< 5000 SR	121	32.5%
5000–10000 SR	123	33.1%
> 10000 SR	128	34.4%
Frequency of changing home in the last 5 years		
Never	210	56.5%
One time	121	32.5%
Two times	28	7.5%
Three or more times	13	3.5%

The first child's age was less than 3 years among 55 (14.8%) parents, 4–6 years among 37 (9.9%) and 7–12 among 62 (16.7%), while 158 (42.5%) parents had children aged over 16 years (Table 2). A total of 198 (53.2%) children were male. In addition, 340

(91.4%) parents reported that their children were with them all the time, while 8 parents' children were not. Moreover, 43 parents (11.6 %) had children with special needs.

Table 2 Personal data of participants' children

Child's personal characteristics	No	%
First child's age (years)		
< 3	55	14.8%
4–6	37	9.9%
7–12	62	16.7%
12–16	60	16.1%
> 16	158	42.5%
First child's gender		
Male	198	53.2%
Female	174	46.8%
Child's residency		
With me all the time	340	91.4%
With me part-time	24	6.5%
Not with me	8	2.2%
Has special needs		
Yes	43	11.6%
No	329	88.4%

Regarding knowledge of children's developmental milestones, 71%, 62.9% and 57% of parents correctly reported the age when most children started to crawl; walk; and hold objects and extend their arms to be picked up, respectively. Furthermore, 32.3%, 28.2% and 4.8% knew the age when most children started counting numbers, reading people's faces and recognizing strangers' faces and began to make some of their own decisions, such as choosing clothes and toys. No parents knew the age at which most children had a best friend (Table 3).

Table 3 Parental knowledge of children's developmental milestones

Developmental milestone items	Incorrect answer		Correct answer	
The age at which most children begin to	No	%	No	%
Interact with their imagination and play imaginary roles	336	90.3%	36	9.7%
Walk	138	37.1%	234	62.9%
Play with their peers	297	79.8%	75	20.2%
Share their toys with other children	301	80.9%	71	19.1%
Play on their own quietly for an hour	296	79.6%	76	20.4%
Make some of their own decisions, such as choosing clothes and toys	354	95.2%	18	4.8%
Crawl	108	29.0%	264	71.0%
Read people's faces and recognizing strangers' faces	267	71.8%	105	28.2%
Make different crying sounds to ask for certain things	267	71.8%	105	28.2%
Bond with their parents	278	74.7%	94	25.3%
Hold objects and extend their arms to be picked up	160	43.0%	212	57.0%
Dress and undress on their own	287	77.2%	85	22.8%
Perceive and discuss justice, injustice and theft	287	77.2%	85	22.8%
Have a best friend	372	100.0%	0	0.0%
Take an interest in and cooperate with those around them	310	83.3%	62	16.7%
Respond to simple instructions	291	78.2%	81	21.8%
Count	252	67.7%	120	32.3%

As in Figure 1, 342 (91.9%) parents had poor knowledge regarding their children's developmental milestones, while only 30 (8.1%) had good knowledge. Moreover, the most reported sources for information were internet sites (81.4%), parents/relatives (81.4%), books and specialized scientific journals (76.3%), TV programs (69.3%), pediatrician or general practitioner (68.3%), social media (62.6%) and educational training courses (39.6%) (Table 4).

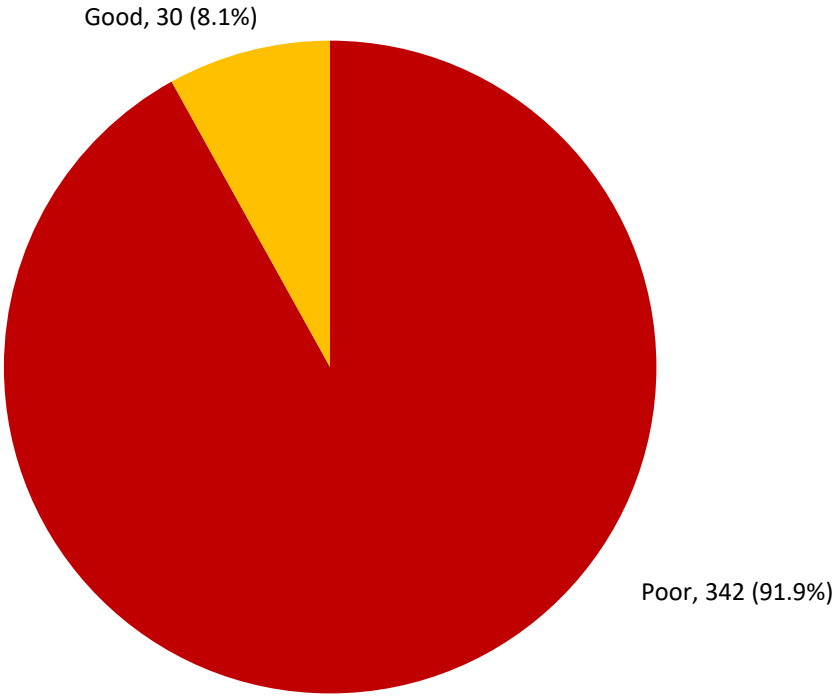

Figure 1 Overall Parental Knowledge of Children's Developmental Milestones in the Eastern Region, Saudi Arabia

Table 4 Source of information regarding children's growth milestones and providing assistance among participants

Source of information	Never		Rarely		Sometimes		Usually	
	No	%	No	%	No	%	No	%
Pediatrician or general practitioner	118	31.7%	71	19.1%	149	40.1%	34	9.1%
Parents/relatives	69	18.6%	44	11.9%	175	47.2%	83	22.4%
Books and specialized scientific journals	88	23.7%	73	19.7%	169	45.6%	41	11.1%
Internet sites	69	18.6%	58	15.7%	176	47.6%	67	18.1%
Social media	139	37.4%	90	24.2%	121	32.5%	22	5.9%
Educational training courses	224	60.4%	60	16.2%	76	20.5%	11	3.0%
TV programs	114	30.7%	94	25.3%	142	38.3%	21	5.7%

Moreover, 9.7% of mothers had a good knowledge level regarding the milestones compared to 3.2% of fathers, with a statistically significant difference (P = 0.048). In addition, 10.6% of university graduates had a good knowledge level versus 4.1% of others (P = 0.026). Good knowledge regarding developmental milestones was detected among 16.2% of parents with their first child aged 4–6 years versus 5.5% of those with a first child under 3 years (P = 0.049). None of the other factors were significantly associated with parents' milestone knowledge level (Table 5).

Table 5 Relation between parents' bio-demographic data, family data and source of information and their knowledge level regarding children's developmental milestones

Factors		Knowledge level				p-value
		Poor		Good		
		No	%	No	%	
Age in years	18–35	137	93.2%	10	6.8%	.625$
	36–55	174	90.6%	18	9.4%	
	55+	31	93.9%	2	6.1%	
Gender	Male	90	96.8%	3	3.2%	.048*$
	Female	252	90.3%	27	9.7%	
Age when had first child	< 18	14	93.3%	1	6.7%	.174$
	18–25	205	90.7%	21	9.3%	
	25–30	92	96.8%	3	3.2%	
	30–35	24	88.9%	3	11.1%	
	35–40	7	77.8%	2	22.2%	
Family size	2–5	190	91.8%	17	8.2%	.929$
	6–10	144	92.3%	12	7.7%	
	> 10	8	88.9%	1	11.1%	
Qualification	Secondary / below	139	95.9%	6	4.1%	.026*
	University / above	203	89.4%	24	10.6%	
Work	Not working	134	89.9%	15	10.1%	.642
	Student	18	90.0%	2	10.0%	
	Working	158	93.5%	11	6.5%	
	Retired	32	94.1%	2	5.9%	
Monthly income	< 5000 SR	109	90.1%	12	9.9%	.463
	5000–10000 SR	116	94.3%	7	5.7%	
	> 10000 SR	117	91.4%	11	8.6%	
First child's age in years	< 3	52	94.5%	3	5.5%	.049*$
	4–6	31	83.8%	6	16.2%	
	7–12	59	95.2%	3	4.8%	
	12–16	57	95.0%	3	5.0%	
	> 16	143	90.5%	15	9.5%	
First child gender	Male	185	93.4%	13	6.6%	.257
	Female	157	90.2%	17	9.8%	
Source of information	Pediatrician or general practitioner	232	91.3%	22	8.7%	.819
	Parents/relatives	277	91.4%	26	8.6%	
	Books and specialized scientific journals	257	90.5%	27	9.5%	
	Internet sites	275	90.8%	28	9.2%	
	Social media	210	90.1%	23	9.9%	
	Educational training courses	135	91.2%	13	8.8%	
	TV programs	233	90.3%	25	9.7%	

P: Pearson X^2 test; $: Exact probability test

** P < 0.05 (significant)*

4. DISCUSSION

Parental knowledge and awareness of developmental milestones influence parental expectations and interactions with their children. Indeed, the literature shows that recognition of child development positively correlates with parenting efficacy and better outcomes. Furthermore, child development has an essential impact on parents' expectations and interactions with their children,

leading to early identification of warning signs and seeking medical advice. Conversely, poor knowledge reflects unnecessary concern about children's health and competency in parenting (Conrad et al., 2006; Reich, 2005).

In our study, all participants performed poorly in the assessment (Table 3). However, their knowledge of motor development was acceptable. The parents correctly reported the age at which most children start to crawl, walk, hold objects and extend their arms to be picked up (71%, 62% and 57.0%, respectively). Participants' knowledge of other categories, including emotional, cognitive and social, was significantly poor, similar to the findings of Aldayel et al., (2020) and Rikhy et al., (2010). Finally, in the social category, no participants knew the correct age at which most children start having a best friend; meanwhile, 16.7% correctly reported the age at which most children began taking an interest in and cooperating with those around them.

Our study found that 91.9% of parents in the Eastern region had poor knowledge of developmental milestones (Figure 1). Compared to a previous study in Riyadh, 80% of parents had a poor overall assessment (Aldayel et al., 2020). In Qatar, maternal knowledge of developmental milestones is relatively low (Al-Maadadi and Ikhlef, 2014). In Iraq, mothers exhibit fair knowledge of developmental milestones (Alkhazrajy and Aldeen, 2017). However, the score of knowledge in the Arab population was higher compared to our study. Furthermore, a study conducted in Gujarat showed that 10.8% of mothers had poor scores and 75.9% had average scores (Nayan et al., 2019). In our study, the main sources of information were internet sites, followed by parents and relatives (81.4% and 81.4%, respectively). The sources of information might explain the low level of knowledge (Table 4). The sources of information identified in the previous studies were parents' experience, the Internet and relatives, similar to our study, and the participants also had low knowledge levels (Aldayel et al., 2020; Alkhazrajy and Aldeen, 2017).

Most studies on normal child development mainly target mothers (Alkhazrajy and Aldeen, 2017; Ertem et al., 2007). We found that mothers had a greater level of knowledge than fathers (Table 5). This could be because mothers spend more time with their children, which might explain the increased knowledge. Other studies have reported similar findings regarding sex (Aldayel et al., 2020; Bornstein and Putnick, 2016; Ertem et al., 2007). Our study found that parents with higher education levels better understood developmental milestones, consistent with other Middle Eastern studies (Alkhazrajy and Aldeen, 2017; Al-Maadadi and Ikhlef, 2014). Other studies found no significant link between parental education and child development awareness (Aldayel et al., 2020; Rikhy et al., 2010). This can be attributed to differences in sample sizes; populations studied and study designs. Furthermore, maternal education indirectly enhances knowledge of child development rather than providing information. Another study suggested that in developing countries, women with higher education may believe they can change their environments, be more alert and observant, gain more modernization and stop relying on traditional values (Ertem et al., 2007). This study demonstrates that it is crucial to offer structured parenting programs and to have culturally appropriate sources of information to enhance parenting skills in Saudi Arabia.

The limitations of our study are that it was an online questionnaire that could affect the accuracy of the answers and could be affected by the participant's level of understanding; moreover, it was an open invitation without specific, targeted populations. Additionally, the study was conducted in one governorate in Saudi Arabia, which made it difficult to generalize the results to other areas due to differences in the population.

5. CONCLUSIONS

Parents in the Al-Ahsa Region, Saudi Arabia, had poor knowledge of developmental milestones for their children, especially in the emotional, cognitive and social areas. Healthcare providers should ensure that parents receive accurate information about child development by providing them with information during routine visits.

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Author's contributions

All authors conceived and designed the study, acquired the data, analysed and interpreted the data, approved the final version to be published and agreed to be accountable for the article and to ensure that all questions regarding the accuracy or integrity of the article are investigated and resolved. LA, HG, SH and MJ drafted the article. KN, LA, MA, ZA and AN revised it critically for important intellectual content.

Consent of publication

Informed consent was obtained from each respondent at the beginning of the questionnaire.

Ethical approval

The study was approved by the Medical Ethics Committee of the Ethics and Research Committee at King Fahad Hospital in Al-Ahsa (Ethical approval code: 53-EP-2021).

Informed consent

Written and oral informed consent was obtained from all participants included in the study. Additional informed consent was obtained from all participants, for whom identifying information was included in this manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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