

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING THE RED FLAGS OF
DEVELOPMENTAL MILESTONES IN CHILDREN LESS THAN 5 YEARS AMONG A
SAMPLE OF MOTHERS ATTENDING FAMILY MEDICINE CENTERS IN
BAGHDAD/AL-KARKH/2024

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ABSTRACT

Background: Developmental milestones are critical indicators of a child's growth and development, and identifying red flags early can help address developmental delays effectively. Parents, particularly mothers, play a pivotal role in monitoring these milestones. **Objective:** To assess the knowledge, attitudes, and practices (KAP) of mothers regarding red flags in developmental milestones for children under five and their association with sociodemographic factors. **Method:** A cross-sectional study was conducted among convenient sample of 385 mothers attending family medicine centers in Al-Karkh, Baghdad, from March to August 2024. Data were collected through structured interviews using a standardized questionnaire covering knowledge (22 questions), attitudes (5 questions), and practices (5 questions) regarding developmental milestones. Sociodemographic data were also analyzed. **Results:** Over half (57.1%) of mothers had poor knowledge, 41.3% had fair knowledge, and only 1.6% had good knowledge of developmental milestone red flags. While 30.1% exhibited good attitudes, 87.8% demonstrated unsatisfactory practices. Factors such as higher maternal education, sufficient income, and younger age of the youngest child were significantly associated with improved KAP. Limited availability of developmental specialists contributed to gaps in practice. **Conclusion:** Most mothers displayed inadequate knowledge, attitudes, and practices concerning developmental milestone red flags. Higher maternal education, father's employment, and sufficient income were linked to better knowledge, attitude and practices.

KEYWORDS: Sociodemographic data were also analyzed.

INTRODUCTION

The early years of life are essential for lifetime learning and growth.^[1] A child's early years play a vital role in optimal growth and development. Fetal brain development starts in the first trimester and continues throughout life.^{[2][3]}

A child's progress on the path of development across definite stages is marked by certain indicators called "developmental milestones," which indicate the age at which children are expected to perform certain tasks under four domains, namely, motor, language, social, and cognitive.^{[4][5]}

Motor domain is about how children use their bodies. Language domain is about how children express their needs and share what they are thinking, as well as

understand what is said to them. Social domain is about how children interact with others and show emotion. Cognitive domain is about how children learn new things and solve problems. It includes how children explore their environment to figure things out – whether by looking at the world around them, putting objects in their mouths, or dropping something to watch it fall. This domain also includes "academic" skills like counting and learning letters and numbers.^[6]

Developmental delay occurs when a child has a delayed achievement of one or more of his/her milestones. Mothers in their care should recognize signs of developmental delay of the children especially language and communication delays which can be even more difficult than identifying physical delays. Missed milestones can be symptoms of developmental delays

that could be associated with more serious medical conditions.^{[7][8]}

According to the World Health Organization (WHO), an estimated 52.9 million children under 5 years old globally have developmental delays or disabilities, with the majority (95%) residing in low- and middle-income countries.^[9]

Although early childhood development received global attention since its inclusion in the UN Sustainable Development Goals, 250 million children (43%) younger than 5 years in low-income and middle-income countries are at risk of not achieving their developmental potential.^[10]

Subjects and Methods

Study design and setting

Descriptive Cross-sectional study with analytic elements, the data was collected during a period of six months from the 1st of March to the 31st of August 2024. The study was conducted at 5 Family medicine centres related to the Baghdad /Al-Karkh health directorate. Inclusion criteria were mothers who had at least one child under the age of five and accept to participate in the study were included. Exclusion criteria were mothers with very severe illnesses.

Tools of data collection

The data were collected using a questionnaire adopted from the Kumar et al.^[11] The questionnaire was filled by direct interviewing to the participants who had at least one child under 5 years of age. It consisted of four parts.

Part (I): Demographic characteristics: of the studied mothers and her husband as age, education, occupation, marital status, total number of children, age of the youngest child, living status, income status and mothers' source of information.

Part (II): Level of knowledge: Knowledge part was divided into four sections which included questions about gross motor (6 questions), fine motor (3 questions), social (6 questions) and language milestones (7 questions).

The scores for knowledge were aggregated to yield a total score based on the 22-item assessment. (0-22). The correct answer was scored (1), the incorrect and I don't know answers were scored (0). Maternal knowledge scores were further categorized as: ($\geq 75\%$ good knowledge, 50-74% fair knowledge, $<50\%$ poor knowledge).

Part (III): attitude

This part is to assess the attitude of the studied mothers regarding the red flags in developmental milestones. It consists of 5 questions, with response options including (strongly agree, agree, neutral, disagree, and strongly disagree).

Scoring system: Each question answer ranged from strongly disagree (1), disagree (2), neutral (3), agree (4), strongly agree (5). The range of scores was from 1-5 which indicates Likert scale used. The total score of attitude was as the following: Positive attitude: $\geq 75\%$ of total attitude score, Neutral attitude 50-74% of total attitude score and negative attitude if the present score was less than 50%.

Part (IV): practice domain

This part is to evaluate the practice of mothers about the red flags in developmental milestones in childhood. It also consists of 5 questions, with answer choices being either multiple choice format or agree/disagree options, And in their scoring each question was labelled as true or false equivalent to 0,1; and the sum score was obtained (total of 5). The practice was labelled as satisfactory when the score was found to be at least 80% of the total score i.e., ≥ 4 .

Ethical approval

Data collection was started after obtaining the official approval from.

1. The scientific committee at Al-Nahrain College of Medicine centre of the Iraqi Board of Medical Specializations.
2. Approval of Al-Karkh Health Directorate to apply the study in primary health care centres.
3. A verbal consent from all the participants was taken before filling the questionnaire after they informed that the collected data was used for research purpose only, and personal information was collected with serial identification numbers without identity.

Statistical analysis

Data entry was done using Microsoft Excel 2019. Data was recorded into different quantitative and qualitative variables for the purpose of analysis. Analysis was done using statistical package for social sciences (SPSS version 26). A two-tailed p value of less than or equal to 0.05 was assigned as a criterion for declaring statistical significance.

RESULTS

The study involved 385 participants, with mothers averaging 31.7 years and fathers averaging 36.0 years. The majority of mothers were illiterate, with 10.4% being illiterate or only reading and writing. The majority of fathers were also illiterate, with 12.5% being illiterate. The majority of mothers (79.5%) were unemployed, while 20.5% were employed. Most participants were married (95.6%), with a small percentage being divorced or widowed (1.6%). Living arrangements varied, with 55.8% living with extended family and 44.2% living alone. Financially, 59.0% reported having enough income. Most families had 1-4 children (84.7%), with the youngest child aged 3-5 years (42.6%). Information sources for mothers were primarily personal experience (72.5%), followed by family and friends (19.5%), social media (4.2%), and doctors or healthcare providers

(3.9%); as shown in table (1).

Table 1: Description of the Sociodemographic characteristic of the participants.

Characteristic	N = 385 ¹
Age of the mother (years)	31.7 ± 6.5
<20	13 (3.38%)
20-24	38 (9.87%)
25-29	76 (19.74%)
30-34	131 (34.03%)
≥35	127 (32.99%)
Mother level of education	
Illiterate/read and write	40 (10.4%)
Primary school	150 (39.0%)
Secondary school	83 (21.6%)
University education / higher	112 (29.1%)
Occupation of the mother	
Unemployed(house wife)	306 (79.5%)
Employed	79 (20.5%)
Age of the father (years)	36.0 ± 7.1
<25	22 (5.71%)
25-29	51 (13.25%)
30-34	94 (24.42%)
35-39	95 (24.68%)
≥40	123 (31.95%)
Father level of education	
Illiterate/read and write	48 (12.5%)
Primary school	145 (37.7%)
Secondary school	79 (20.5%)
University education / higher	113 (29.4%)
Occupation of the father	
Unemployed	268 (69.6%)
Employed	117 (30.4%)
Marital status	
Married	368 (95.6%)
Divorced	11 (2.9%)
Widowed	6 (1.6%)
Living status	
With extended family	215 (55.8%)
Alone	170 (44.2%)
Income status	
Enough	227 (59.0%)
Not enough	158 (41.0%)
Total number of children	
1-4	326 (84.7%)
5-8	52 (13.5%)
≥ 9	7 (1.8%)
Age of the youngest child (years)	
4-5	164 (42.6%)

1-3	147 (38.2%)
> 1	74 (19.2%)
Mother's source of the information	
Personal experience	279 (72.5%)
Others (family, friends...)	75 (19.5%)
Social media	16 (4.2%)
Doctors or health care providers	15 (3.9%)

Table (2) shows that 57.1% of parents had poor knowledge, 41.3% had fair knowledge, and only 1.6% had good knowledge. In terms of attitudes, 9.9% of parents exhibited poor attitudes, 60.0% had fair attitudes, and 30.1% displayed good attitudes. practice toward developmental milestones' red flags was satisfactory 12.2% of participants while 87.8% had not satisfactory practice.

Table 2: Level of knowledge, attitude and practice regarding developmental milestone's red flags.

Characteristic	N = 385 ¹
Level of knowledge	
Poor	220 (57.1%)
Fair	159 (41.3%)
Good	6 (1.6%)
Level of attitude	
Poor	38 (9.9%)
Fair	231 (60.0%)
Good	116 (30.1%)
Level of practice	
Not Satisfactory	338 (87.8%)
Satisfactory	47 (12.2%)

¹n (%)

Table (3) shows that mothers with higher levels of education were more likely to have good knowledge, with 66.7% having university or higher education. Father's occupation also had a significant association with knowledge, with more employed fathers in the poor knowledge group (35.5%) compared to the good knowledge group (33.3%). Income status was another significant factor, with 100% of those with good knowledge reporting enough income. The age of the youngest child also showed significance, with all mothers with good knowledge having children aged 1-3 years, while the majority with poor knowledge had children aged 3- 5 years. Other factors did not show significant associations with knowledge level.

Table 3: Association between level of knowledge and sociodemographic characteristics of the mothers.

Characteristic	Good, N = 6 ¹	Fair, N = 159 ¹	Poor, N = 220 ¹	P-value ²
Age of the mother (years)	34.3 ± 3.6	31.3 ± 6.8	31.9 ± 6.4	0.4
Mother level of education				0.009
Primary school	0 (0.0%)	62 (39.0%)	88 (40.0%)	

Secondary school	0 (0.0%)	44 (27.7%)	39 (17.7%)	
University education / higher	4 (66.7%)	41 (25.8%)	67 (30.5%)	
Occupation of the mother				0.6
Unemployed	4 (66.7%)	128 (80.5%)	174 (79.1%)	
Employed	2 (33.3%)	31 (19.5%)	46 (20.9%)	
Age of the father (years)	34.7 ± 3.4	35.8 ± 6.9	36.2 ± 7.4	0.8
Father level of education				0.073
Illiterate/read and write	0 (0.0%)	17 (10.7%)	31 (14.1%)	
Primary school	2 (33.3%)	72 (45.3%)	71 (32.3%)	
University education / higher	2 (33.3%)	36 (22.6%)	75 (34.1%)	
Occupation of the father				0.030
Unemployed	4 (66.7%)	122 (76.7%)	142 (64.5%)	
Employed	2 (33.3%)	37 (23.3%)	78 (35.5%)	
Marital status				0.3
Married	6 (100.0%)	154 (96.9%)	208 (94.5%)	
Divorced	0 (0.0%)	5 (3.1%)	6 (2.7%)	
Widowed	0 (0.0%)	0 (0.0%)	6 (2.7%)	
Living status				0.3
With extended family	2 (33.3%)	94 (59.1%)	119 (54.1%)	
Alone	4 (66.7%)	65 (40.9%)	101 (45.9%)	
Income status				0.001
Enough	6 (100.0%)	79 (49.7%)	142 (64.5%)	
Not enough	0 (0.0%)	80 (50.3%)	78 (35.5%)	
Total number of children				0.8
1-4	6 (100.0%)	134 (84.3%)	186 (84.5%)	
5-8	0 (0.0%)	21 (13.2%)	31 (14.1%)	
≥9	0 (0.0%)	4 (2.5%)	3 (1.4%)	
Age of the youngest child				0.004
≤ 1	0 (0.0%)	35 (22.0%)	39 (17.7%)	
1-3	6 (100.0%)	67 (42.1%)	74 (33.6%)	
3-5	0 (0.0%)	57 (35.8%)	107 (48.6%)	
Mother's source of the information				0.2
Personal experience	4 (66.7%)	114 (71.7%)	161 (73.2%)	
Others (family, friends,)	0 (0.0%)	31 (19.5%)	44 (20.0%)	
Social media	0 (0.0%)	7 (4.4%)	9 (4.1%)	
Doctors or health care providers	2 (33.3%)	7 (4.4%)	6 (2.7%)	
¹ Mean ± SD; n (%)				
² One-way ANOVA; Fisher's exact test				

Table (4) shows that mothers with higher education levels had better attitudes, with 44.8% having university or higher education. Employment status was also significantly associated with attitudes, with all mothers with poor attitudes being unemployed. Fathers' employment status was also significant, with 37.9% of those with good attitudes being employed compared to 18.4%. Income status was also significantly associated with attitudes, with 77.6% of those with good attitudes reporting having enough income. The source of information was also a significant factor, with 77.6% of those with good attitudes relying on personal experience. Other factors like the mother's age, father's age, marital status, living status, total number of children, and the youngest child's age did not show significant associations with attitude levels.

Table 4: Association between level of attitude and sociodemographic characteristics of the mothers.

Characteristic	Good, N = 116 ¹	Fair, N = 231 ¹	Poor, N = 38 ¹	P-value ²
Age of the mother (years)	32.1 ± 5.5	31.8 ± 6.4	30.1 ± 9.5	0.3
Mother level of education				< 0.001
Illiterate/read and write	7 (6.0%)	22 (9.5%)	11 (28.9%)	
Primary school	21 (18.1%)	107 (46.3%)	22 (57.9%)	
Secondary school	36 (31.0%)	42 (18.2%)	5 (13.2%)	
University education / higher	52 (44.8%)	60 (26.0%)	0 (0.0%)	
Occupation of the mother				0.004
Unemployed	89 (76.7%)	179 (77.5%)	38 (100.0%)	
Employed	27 (23.3%)	52 (22.5%)	0 (0.0%)	
Age of the father (years)	36.2 ± 6.1	36.0 ± 7.2	35.6 ± 9.3	>0.9
Father level of education				
Illiterate/read and write	11 (9.5%)	30 (13.0%)	7 (18.4%)	
Primary school	25 (21.6%)	97 (42.0%)	23 (60.5%)	
Secondary school	28 (24.1%)	43 (18.6%)	8 (21.1%)	
University education / higher	52 (44.8%)	61 (26.4%)	0 (0.0%)	
Occupation of the father				0.048
Unemployed	72 (62.1%)	165 (71.4%)	31 (81.6%)	
Employed	44 (37.9%)	66 (28.6%)	7 (18.4%)	
Marital status				0.11
Married	112 (96.6%)	222 (96.1%)	34 (89.5%)	
Divorced	2 (1.7%)	5 (2.2%)	4 (10.5%)	
Widowed	2 (1.7%)	4 (1.7%)	0 (0.0%)	
Living status				0.5
With extended family	60 (51.7%)	135 (58.4%)	20 (52.6%)	
Alone	56 (48.3%)	96 (41.6%)	18 (47.4%)	
Income status				<0.001
Enough	90 (77.6%)	124 (53.7%)	13 (34.2%)	
Not enough	26 (22.4%)	107 (46.3%)	25 (65.8%)	
Total number of children				0.4
1-4	103			
(88.8%)	193 (83.5%)	30 (78.9%)		
5-8	12 (10.3%)	32 (13.9%)	8 (21.1%)	
≥ 9	1 (0.9%)	6 (2.6%)	0 (0.0%)	
Age of the youngest child				0.10
3-5	47 (40.5%)	106 (45.9%)	11 (28.9%)	
1-3	51 (44.0%)	81 (35.1%)	15 (39.5%)	
≤ 1	18 (15.5%)	44 (19.0%)	12 (31.6%)	
Mother's source of the information				0.034
Personal experience	90 (77.6%)	165 (71.4%)	24 (63.2%)	
Others (family, friends,)	14 (12.1%)	47 (20.3%)	14 (36.8%)	
Social media	7 (6.0%)	9 (3.9%)	0 (0.0%)	
Doctors or health care providers	5 (4.3%)	10 (4.3%)	0 (0.0%)	
1Mean ± SD; n (%)				
2One-way ANOVA; Pearson's Chi-squared test; Fisher's exact test				

Table (5) shows that mothers with higher education levels and employment status reported better practices, with 44.7% of those with university education reporting

satisfactory practices compared to 19.1% of illiterate or barely literate mothers. Father's occupation was also significantly associated with the level of practice, with

employed fathers reporting more satisfactory practices (48.9%). Marital status, living situation, and income status did not show significant associations with the level of practice. However, the source of information for the mother was a key factor, with mothers who relied on personal experience having lower rates of satisfactory

practices (57.4%). The age of the youngest child was also related to the level of practice, with mothers with children aged 1-3 years reporting more satisfactory practices (53.2%). The total number of children did not significantly affect practice levels.

Table 5: Association between level of practice and sociodemographic characteristics of the mothers.

Characteristic	Not Satisfactory, N = 338 ¹	Satisfactory, N = 47 ¹	P-value ²
Age of the mother (years)	31.6 ± 6.7	32.2 ± 4.7	0.5
Mother level of education			0.002
Illiterate/read and write	31 (9.2%)	9 (19.1%)	
Primary school	137 (40.5%)	13 (27.7%)	
Secondary school	79 (23.4%)	4 (8.5%)	
University education / higher	91 (26.9%)	21 (44.7%)	
Occupation of the mother			0.093
Unemployed	273 (80.8%)	33 (70.2%)	
Employed	65 (19.2%)	14 (29.8%)	
Age of the father (years)	36.1 ± 7.3	35.9 ± 5.5	0.9
Father level of education			0.15
Illiterate/read and write	40 (11.8%)	8 (17.0%)	
Primary school	132 (39.1%)	13 (27.7%)	
Secondary school	72 (21.3%)	7 (14.9%)	
University education / higher	94 (27.8%)	19 (40.4%)	
Occupation of the father			0.003
Unemployed	244 (72.2%)	24 (51.1%)	
Employed	94 (27.8%)	23 (48.9%)	
Marital status			0.7
Married	323 (95.6%)	45 (95.7%)	
Divorced	9 (2.7%)	2 (4.3%)	
Widowed	6 (1.8%)	0 (0.0%)	
Living status			0.050
With extended family	195 (57.7%)	20 (42.6%)	
Alone	143 (42.3%)	27 (57.4%)	
Income status			0.5
Enough	197 (58.3%)	30 (63.8%)	
Not enough	141 (41.7%)	17 (36.2%)	
Total number of children			0.7
1-4	285 (84.3%)	41 (87.2%)	
5-8	47 (13.9%)	5 (10.6%)	
≥9	6 (1.8%)	1 (2.1%)	
Age of the youngest child			0.069
≤ 1	66 (19.5%)	8 (17.0%)	
1-3	122 (36.1%)	25 (53.2%)	
3-5	150 (44.4%)	14 (29.8%)	
Mother's source of the information			0.002
Personal experience	252 (74.6%)	27 (57.4%)	
Others (family, friends,)	65 (19.2%)	10 (21.3%)	
Social media	9 (2.7%)	7 (14.9%)	
Doctors or health care providers	12 (3.6%)	3 (6.4%)	
¹ Mean ± SD; n (%)			
² Welch Two Sample t-test; Fisher's exact test; Pearson's Chi-squared test			

DISCUSSION

Maternal knowledge about developmental milestones is crucial as it directly influences a child's growth and development. Mothers who are well-informed about

these milestones are better equipped to create supportive environments that foster their children's cognitive, emotional, and physical development.^[12]

The present study found that more than half the mothers showed poor knowledge regarding the developmental milestones. This finding is consistent with the study done in UAE in 2023 who reported that two-thirds of mothers in the UAE demonstrated low knowledge about child development. While 62% were aware of gross motor skills, only 44% knew the age for fine motor skills like scribbling, and only 8% recognized the age for social skills such as dressing independently.^[13] In Saudi Arabia, another study done in 2020 included 358 mothers and found that 84.6% scored poorly on knowledge of developmental milestones.^[14] Another Saudi Arabia study done in 2022 reported that among 375 parents, only 29 (7.7%) had an excellent knowledge level, whereas 180 (48%) had acceptable level, and 141 (37.6%) had poor knowledge.^[15] In India, a study done in 2024 demonstrated that 42.11% of mothers had a good knowledge of the developmental milestones of their babies. Most of the knowledge (54.38%) was found in the initial milestones section, while the least amount (33.15%) was found in language.^[16] The high percent of poor knowledge might be due to low education levels of the sample as more than 70% of them did not reach university level. Additionally, lack of access to reliable information plays a crucial role; many mothers do not engage with healthcare professionals or educational resources that could provide essential knowledge about child development. Furthermore, cultural beliefs and practices may influence perceptions of child development, leading to misconceptions about when children should achieve specific milestones.

The present study found that only one-third of mothers showed good attitudes. This is worrying as around only one third agreed that developmental delay is indicative of disabilities, this might be related to low education of the mother and father and living in extended family will affect the decision to seek a doctor by grand mother or father. Another reason is the misconception that developmental delays are merely temporary and that children will eventually progress with their development without intervention, leading some to underestimate the significance of these delays. This finding is consistent with a study done in Pakistan in 2024 which found that only 29.2% of parents had an adequate attitude towards their children's developmental milestones, with 64.4% independently researching them. Only 55.9% would seek a developmental delay evaluation if their child had a positive family history of developmental delay, 42.6% of parents believed motor development delays could indicate physical impairment, while 31% agreed that social and linguistic delays could lead to deafness or mute.^[11] Another study done in Saudi in 2024 reported mixed attitudes as 51.5% of parents actively sought developmental milestone information, with 49.2% stating pediatricians provide sufficient information, 57.9% screen for milestones based on family history, with 32.6% identifying motor development delays as physical disabilities.^[17] Another study done in the United states in 2019 reported that only 29.34% of respondents correctly

identified that they should refer a child with developmental delays to a developmental pediatrician.^[18]

Regarding practices, the current study found that only one-tenth reported satisfactory practices. The most significant practice gap was that only a minority considering visiting a developmental pediatrician when their child exhibits developmental delay. This is due to the lack of this specialty in Iraq; therefore, mothers prefer to consult a general pediatrician who might or might not refer them to a Neuropediatrician. In addition, most mothers reported visiting a pediatrician only during the child's sickness. This is inconsistent with the study of Pakistan done in 2024 who reported that 54.6% had satisfactory practices, as 51.5% said they visited pediatricians about 1–2 times a year while 37.4% consult them more than 2 times a year. Only 5.1% parents said they visit as per need. Moreover, 21% reported that they would consult a development pediatrician in case their child showed developmental delay.^[17] The study of Saudi done in 2024 reported that 54.6% had satisfactory practices, as 50.3% preferred consulting a developmental pediatrician. Moreover, 60.9% reported visiting or consulting a pediatrician as per their child's needs, while only 16.7% visited a pediatrician more than twice a year.^[17] A notable finding of this study is that most participants spent time and engaged with their children. This is consistent with an Indian study done in 2014 which revealed that about 91% of parents often arranged physically active games, which will help them get exposed to various surfaces and play materials. 91% of parents often practiced teaching their child good values like sharing toys, food, and respecting elders.^[19]

The current study found that higher maternal education was a predictor of improved knowledge, attitude, and practice. This is consistent with the Iraqi study done in 2017 by Dr. Lujain Al-Khazraji who found that higher maternal educational level was associated with improved knowledge regarding each of motor, cognitive, social, and language milestones.^[20] A study done in Saudi Arabia in 2021 reported that maternal education positively influenced their understanding of child development, as mothers with higher educational level demonstrated significantly better knowledge compared to those with lower education levels.^[21] Another Saudi study done in 2023 indicated that mothers' education was positively correlated with their knowledge of developmental milestones, reinforcing the idea that educational attainment plays a crucial role in this aspect.^[22]

The present study also found that fathers being employed was associated with improved knowledge, attitude and practice. Similarly, higher family financial income was associated with significantly improved knowledge and attitude. Mother's employment was also found to be a predictor of improved attitude. This is consistent with the Saudi study done in 2020 who reported that maternal socio-economic status, including income levels,

significantly affected awareness regarding child development. Mothers from higher-income backgrounds exhibited greater knowledge about developmental milestones and were more likely to access healthcare services and educational resources.^[16]

Another notable finding of this study is that mothers who had older age of youngest child (3-5 years) exhibited significantly lower knowledge. A possible reason is that mothers with older children may rely on their previous experiences, leading to overconfidence in their knowledge. This is inconsistent with the study done in Saudi Arabia in 2020 which reported that mothers with older children were 1.5 times more likely to have an acceptable level of knowledge than mothers with younger children.^[23]

CONCLUSION

High proportion of Iraqi mothers demonstrated poor knowledge regarding developmental milestones. Predictors of good knowledge were higher maternal education, father's employment, sufficient income status, and younger age of youngest child. Around one third had good attitude. Mother's education, maternal and paternal employment, sufficient income status were predictors of good attitude. The majority of women showed unsatisfactory practices. Factors associated with satisfactory practice were higher maternal education and father's employment.

REFERENCES

1. Scharf RJ, Scharf GJ, Stroustrup A. Developmental Milestones. *Pediatr Rev*, 2016; 37(1): 25–37; quiz 38, 47.
2. Khan I, Leventhal BL. *Developmental Delay*. Treasure Island (FL), 2025.
3. Bélanger SA, Caron J. Evaluation of the child with global developmental delay and intellectual disability. *Paediatr Child Health* 2018; 23(6): 403–19.
4. Varghese SS, Joseph M, Gohil R, Thomas S, Jose SM, Lukose P, et al. How aware are mothers about early childhood developmental milestones? A cross-sectional study at a maternity hospital in rural South India. *Indian J Child Health* 2020; 7(11): 441–5.
5. Misirliyan SS, Boehning AP, Shah M. *Development Milestones*. Treasure Island (FL): 2025.
6. Zubler JM, Wiggins LD, Macias MM, Whitaker TM, Shaw JS, Squires JK, et al. Evidence-Informed Milestones for Developmental Surveillance Tools. *Pediatrics* 2022;
7. I Shehri AA, Al Sadoun AA. Saudi mothers' knowledge and awareness of infant developmental milestones. *Curr Pediatr Res* 2020; 24: 163–71.
8. Jahromi LB, Guimond AB, Umaña-Taylor AJ, Updegraff KA, Toomey RB. Family context, Mexican-origin adolescent mothers' parenting knowledge, and children's subsequent developmental outcomes. *Child Dev* 2014; 85(2): 593–609.
9. Olusanya BO, Davis AC, Wertlieb D, Boo NY, Nair MKC, Halpern R, et al. Developmental disabilities among children younger than 5 years in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Glob Heal* 2018; 6(10): e1100–21.
10. Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, et al. Nurturing care: promoting early childhood development. *Lancet* (London, England) 2017; 389(10064): 91–102.
11. Kumar R, Ali M, Pasha MS, Ansari HW, Durrani N. Knowledge, attitude, and practices of parents regarding the red flags of developmental milestones in children aged 0-5 years in Karachi, Pakistan: a cross-sectional study. *BMC Pediatr*, 2024; 24(1): 120.
12. Karuppannan A, Ramamoorthy T, Rammamoorthi A, Ravichandran L. Mother's knowledge on child's developmental milestones and parenting skills in Kanchipuram District, Tamilnadu: a descriptive cross sectional study. *Int J Heal Sci Res [Internet]*, 2020; 10(2): 242–7.
13. Saleh S, AlGhfeli M, Al Mansoori L, Al Kaabi A, Al Kaabi S, Nair SC. Knowledge and Awareness Among Mothers Regarding Early Childhood Development: A Study From the United Arab Emirates. *Cureus* 2023; 15(4): e37027.
14. Darsoni DJG AL, Shehri DNA AL. Milestones: Are mothers aware? *Int J Adv Community Med* 2020; 3(4): 09–14.
15. Habbash AS, Qatomah A, Al-Doban R, Asiri R. Parental knowledge of children's developmental milestones in Aseer, Saudi Arabia. *J Fam Med Prim care* 2022; 11(9): 5093–102.
16. Anushka D, Srinivasan A. Study of Knowledge About the Developmental Milestones of Children in Primiparous Mothers. *J Ecophysiol Occup Heal* 2024; 199–203.
17. Alzahrani SA, Alzahrani AM, Alsalem AA, Almudaymigh NK, Alghamdi MA, Alzahrani RS, et al. Evaluating the Knowledge, Attitudes, and Practices of Saudi Arabian Parents Regarding Red Flags in Developmental Milestones. *Cureus*, 2024; 16(1): e52769.
18. Chödrön G, Pizur-Barnekow K, Viehweg S, Puk-Ament A, Barger B. Childcare providers' attitudes, knowledge, and practice related to developmental monitoring to promote early identification and referral. *Early Child Dev Care* 2021; 191(4): 520–34.
19. Chivate S, Hawaldar S. Knowledge, Attitude, and Practice among Parents toward Early Childhood Development in Belagavi City: A Cross-sectional Study. *Indian J Phys Ther Res*, 2024; 6(1): 89–93.
20. Alkhazrajy LA, Aldeen ERS. Assessment of mothers knowledge regarding the developmental milestone among children under two years in Iraq. *Am J Appl Sci*, 2017; 14(9): 869–77.
21. Alqurashi F, Awary B, Khan B, AlARhain S, Alkhaleel A, Albahrani B, et al. Assessing

- knowledge of Saudi mothers with regard to parenting and child developmental milestones. J Fam Community Med, 2021; 28(3): 202.
22. Al Noaim K, Alalawi L, Al Ghadeer H, Naim A, Aljumah M, Alabdulqader M, et al. Parental knowledge of children's developmental milestones in Al-Ahsa, Saudi Arabia. Med Sci, 2023; 27.
23. Aldayel AS, Aldayel AA, Almutairi AM, Alhussain HA, Alwehaibi SA, Almutairi TA. Parental Knowledge of Children's Developmental Milestones in Riyadh, Saudi Arabia. Int J Pediatr, 2020; 2020: 1–8.