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Determination of Mothers level of Knowledge toward Children's Developmental Milestones visiting Dr. Jamal Ahmed Rashid Pediatric Teaching Hospital in Sulaimaniyah City / Iraq

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ABSTRACT

Background: Recognizing child developmental milestones is essential for the early detection of developmental delays and promoting optimal growth in children. While studies in developed countries emphasize the beneficial effects of maternal awareness on child development, such research is scarce in the Arab region. This study aimed to assess the level of knowledge among mothers concerning their children's developmental milestones in Sulaimaniyah city, Iraq, and to investigate the relationship between this understanding and their socio-demographic factors.

Methods: A quantitative and descriptive research approach was employed from December 15th 2022 to March 15th 2023 at Dr. Jamal Ahmed Rashid Pediatric Teaching Hospital in Sulaimaniyah city. A purposive sample of 160 mothers with children under the age of two was selected. Data were gathered through a structured questionnaire including socio-demographic attributes and knowledge on developmental milestones. The reliability of the questionnaire was strong (Cronbach's alpha = 0.831). Descriptive statistics and chi-square tests were conducted for data analysis using SPSS version 24.

Results: The findings indicated that highest number of mothers had fair level of overall understanding regarding child developmental milestones. Statistical examination showed significant differences between maternal age and awareness of motor and language development; between financial condition and knowledge of motor development; and between child's birth order and understanding of motor, cognitive, and language development ($p \leq 0.05$). Significant associations were found between maternal education with language development level showed a significant correlation with knowledge of language development and number of children with language and cognitive development.

Conclusions and recommendations: more than half of mothers have fair level of knowledge in overall areas of developmental millstones. Statistically, there are associations between mother's age and child's birth orders with mother's level of knowledge in term of motor, cognitive, and language domains.

Recommendation: Enhance the mother's level of knowledge and awareness about child developmental milestones through implementing comprehensive educational programs about this important issue is highly recommended.

Keywords: *developmental milestones, mother, knowledge, children under 2 years old*

1. INTRODUCTION

Child development is a crucial indication of a child's comprehensive growth and physical advancement. The early years of life play a vital role in influencing a child's behavior, cognitive skills, and overall well-being. (Manas, 2020). Developmental milestones represent a collection of skills, behaviors, or abilities that are exhibited by certain ages in early childhood and infancy during normal development. They reflect specific behavioral accomplishments or abilities that signify certain stages of development (Lopchan, and Dangol, 2021). Moreover, they refer to the capabilities or tasks that children can perform at specific ages within the physical, cognitive, social, emotional, and language areas (David, et al, 2014). If children fail to reach these milestones, they may be at an increased risk for experiencing developmental issues (Findly, et al, 2014). Understanding child development can be gained by recognizing early childhood milestones, ongoing developmental changes, and becoming familiar with parenting techniques. Research conducted in various developed nations indicated that mothers' awareness of child development had a positive relationship with the enhancement of their ability to foster child growth (Alqurashi, et al, 2021).

Understanding developmental milestones is crucial for evaluating typical growth and recognizing any developmental delays. Healthy growth and development occur only when there is adequate nutrition, protection from frequent infections, and absence of negative genetic and environmental factors (Joshi, et al, 2019).

Family plays an essential role in assessing a child's development within the team. As a child's initial educator, parents significantly contribute to overall growth and education (Soni, and Srinivasan, 2021). The interactions between parents and children, as well as their expectations, are shaped by their perceptions of child development (David, et al, 2014). Parents who possess high efficacy and competence in parenting exhibit a strong understanding of their child's developmental stages. Conversely, parents lacking sufficient knowledge demonstrated insufficient parenting skills despite their belief in their parenting abilities (Alqurashi, et al, 2021). Evaluating a child's development requires collaboration with the family playing a key role. Mothers can recognize the developmental milestones of their infants through careful observation. A mother can share any concerns or issues she has with the infant's physician. Studying parents' understanding of their child's developmental milestones and the influence of that knowledge on their parenting methods is relatively new in the Arab world. Unlike Western studies, there are few reports from the Middle East, and they often lack a necessary scientific agreement on the topic (Alkhazrajy, L.A. and Aldeen, 2017). Studies have demonstrated that mothers who possess greater knowledge of their children's development are more inclined to offer developmental stimulation, resulting in improved developmental outcomes. Additionally, healthcare professionals may depend on parents' understanding of their children's health and development when making decisions, providing counseling, and suggesting referrals. Increased awareness of a child's developmental milestones can facilitate the early identification of developmental delays and health concerns (Karuppannan, et al, 2020). The existing body of research regarding parenting and parental awareness of developmental milestones is extensive; however, it should also emphasize areas such as the impact of parenting knowledge and techniques on a child's cognitive development and emotional growth (Carra, et al, 2013). Variations in parenting styles across cultures, as well as the relationship between parents' socioeconomic backgrounds and their understanding of child-rearing methods (Ertem, et al, 2007).

Importance of the study:

Mothers who understand developmental milestones are more capable of identifying when their child may be falling behind. Recognizing delays early can result in prompt interventions, which can greatly enhance outcomes for children. Moreover, empowers them to participate in age-appropriate activities that encourage growth and learning. In addition, when mothers are aware of the developmental milestones to anticipate, they can implement practices that support healthy physical, cognitive, and emotional growth. This proactive stance can create a nurturing atmosphere for their children's development and gain insights into their child's behavior and signals, resulting in more communication and interaction.

2. MATERIALS AND METHOD

A quantitative design, descriptive study was selected to assess mothers' level of Knowledge concerning Children's Developmental Milestones from December 15th 2022 to March 15th 2023. The study was approved by scientific committee and Nursing College Council/University of Sulaimani, an official letter from college of nursing was submitted to General Directorate of Health in order to inform Dr. Jamal Ahmed Rashid teaching hospital in Sulaimaniyah city for the purpose of data collection. The study was conducted at Dr. Jamal Ahmed Rashid Pediatric Teaching Hospital in Sulaimaniyah city. Purposive sample technique used to select 160 mothers who have been admitted to the hospital according to inclusion criteria as mothers who have children under two years old and agree to participate in the current study. For the purpose of data collection, a designed questionnaire was developed consisting of sample's demographic characteristics consisted of nine variables (age, level of education, occupation, financial status, residency, marital status, number of children, child ranking), and items relevant to mothers' knowledge about child's developmental milestone in four aspects, which are motor (14 items), cognitive (10 items), language (13 items), and social/emotional (7 items). Alpha Cronbach was used to test reliability of the study tool with the value is equal to (0.831) indicating highly reliability. Scale of the knowledge part was know and don't know and scored as (0, and 1) respectively. The levels of knowledge for motor aspect was (poor=0-6, fair=7-10, good=11-14); for cognitive aspect (poor=0-4, fair=5-7, good=8-10); for language (poor= 0-6, fair=7-10, good=11-13); and for social aspect (poor=0-3, fair=4-5, good=6-7). The data was collected through personal interview with each mother separately after obtaining her agreement. Data gathered and inserted into an excel sheet and analyzed using SPSS, version 24. Descriptive statistics (frequency and percentage) was used for the demographic part and inferential statistics (chi square) to find out associations between mothers' demographic data and their levels of knowledge about the four aspects of child's developmental milestone.

3. RESULTS OF THE STUDY

Table (1): distribution of sample according to socio demographic characteristics.

Variables		Frequency	%
Age	19-28	50	31.25
	29-38	84	52.50
	≥ 39	26	16.25
Educational level	Illiterate	12	7.50
	Primary	36	22.50
	Secondary	66	41.25
	University or Institute	46	28.75
Employment status	Employed	18	11.25
	Not employed	142	88.75
Financial status	Sufficient	80	50.00
	Barely sufficient	62	38.75
	Insufficient	18	11.25
Residence	Urban	112	70.00
	Suburban	48	30.00
Marital status	Divorce	0	0.00
	Widow	2	1.25
	Couple	158	98.75
Number of children	1-2	86	53.75
	3-4	60	37.50
	≥5	14	8.75
Birth order	1	36	22.50
	2	51	31.88
	3	46	28.75
	4	13	8.13
	5	14	8.75
Total		**160**	**100.0**

Table (1) displays the socio demographic details of the sample included in this research. More than half of mothers between the ages of 29 and 38 (52.5%) years old. In terms of education, 41.25% had secondary stage attainment followed by higher education graduates 28.75% and 7.5% were illiterate. Majority (88.75%) were unemployed. Half of the mothers have perceived sufficient financial status. 70% living in urban while 30% are suburban residents. The vast majorities (98.75) were married and the rest were divorced. In terms of number of children 53.75% of participants have 1-2 children, 37.5%, have 3-4 children and the rest have five or more children. The distribution of children by birth order revealed that 31.88% were second-born, 28.75% were third-born, and 22.5% were first-born, with lesser percentages falling into the fourth (8.13%) and fifth (8.75%) birth order groups.

Table (2): distribution of sample according to the mother's level of knowledge toward child's developmental Milestones .

Levels	Motor		Cognitive		Language		Social		Over All	
	Fr.	%	Fr.	%	Fr.	%	Fr.	%	Fr.	%
Poor	22	13.75	58	36.25	50	31.25	66	41.25	40	25.0
Fair	84	52.5	84	52.5	74	46.25	36	22.5	96	60.0
Good	54	33.75	18	11.25	36	22.5	58	36.25	24	15.0
Total	160	100	160	100	160	100	160	100	160	100

Table (2) reveals mothers' level of knowledge about child's developmental milestone. 60% of mothers were at fair or moderate level of knowledge in all domains, 25% of mothers at poor level of knowledge, and 15% of mothers were at good level of knowledge.

Table (3): Association between sample Socio demographic characteristics and Mother's Level of Knowledge in term of gross and fine motor domain.

Socio demographic characteristics		**Level of knowledge (Motor)**						**p-value**
		Poor		**Fair**		**Good**		
		Fr.	**%**	**Fr.**	**%**	**Fr.**	**%**	
Age	19-28	4	18.2	30	35.7	16	29.6	**0.006**
	29-38	8	36.4	44	52.4	32	59.3	
	≥ 39	10	45.5	10	11.9	6	11.1	
Educational level	Illiterate	4	18.2	4	4.8	4	7.4	0.227
	Primary	6	27.3	18	21.4	12	22.2	
	Secondary	10	45.5	34	40.5	22	40.7	
	University or Institute	2	9.1	28	33.3	16	29.6	
Financial status	Sufficient	9	40.9	46	54.8	25	46.3	**0.011**
	Barely sufficient	6	27.3	30	35.7	26	48.1	
	Insufficient	7	31.8	8	9.5	3	5.6	
Number of children	1-2	10	45.5	52	61.9	24	44.4	0.117
	3-4	8	36.4	28	33.3	24	44.4	
	≥5	4	18.2	4	4.8	6	11.1	
Birth order	1	2	9.1	28	33.3	6	11.1	**0.014**
	2	8	36.4	25	29.8	18	33.3	
	3	4	18.2	22	26.2	20	37.0	
	4	4	18.2	5	6.0	4	7.4	
	5	4	18.2	4	4.8	6	11.1	
Total		22	100.0	84	100.0	54	100.0	

Table (3) displays statistical significant associations between mothers' age, financial status and child's birth order (P≤0.05) with mothers' knowledge about motor development milestone, while there is no statistical association between mothers' level of education and number of their children (P≥0.05).

Table (4): Association between sample Socio demographic characteristics and Mother's Level of Knowledge in term of cognitive domain.

Socio demographic characteristics		Level of knowledge (cognitive)						p-value
		Poor		Fair		Good		
		Fr.	%	Fr.	%	Fr.	%	
Age	19-28	12	20.6	34	40.5	4	22.2	**0.022**
	29-38	32	55.2	40	47.6	12	66.7	
	≥ 39	14	24.1	10	11.9	2	11.1	
Educational level	Illiterate	4	6.9	6	7.1	2	11.1	0.213
	Primary	18	31.0	16	19.0	2	11.1	
	Secondary	26	44.8	32	38.1	8	44.4	
	University or Institute	10	17.2	30	35.7	6	33.3	
Financial status	Sufficient	33	56.9	36	42.9	11	61.1	0.357
	Barely sufficient	18	31.0	38	45.2	6	33.3	
	Insufficient	7	12.1	10	11.9	1	5.6	
Number of children	1-2	24	41.4	50	59.5	12	66.7	0.08
	3-4	30	51.7	26	31.0	4	22.2	
	≥5	4	6.9	8	9.5	2	11.1	
Birth order	1	10	17.2	22	26.2	4	22.2	**0.008**
	2	15	25.9	28	33.3	8	44.4	
	3	18	31.0	26	31.0	2	11.1	
	4	11	19.0	0	0.0	2	11.1	
	5	4	6.9	8	9.5	2	11.1	
Total		58	100.0	84	100.0	18	100.0	

Table (4) represents the association between the mother's level of knowledge in term of the child's cognitive developmental milestones and some socio demographic characteristics as shows that there is a statistical significant difference between the mother's level of knowledge toward the child's cognitive developmental milestones with mothers age, and child's birth order (P≤0.05), in contrast, no statistical differences observed between mothers knowledge on child's cognitive developmental milestone and their level of education financial status and number of children (P≥0.05).

Table (5): Association between sample Socio demographic characteristics and Mother's Level of Knowledge in term of language domain.

Socio demographic characteristics		level of knowledge(language)						p-value
		Poor		Fair		Good		
		Fr.	%	Fr.	%	Fr.	%	
Age	19-28	10	20.0	30	40.5	10	27.8	**0.025**

	29-38	28	56.0	34	45.9	22	61.1	
	≥ 39	12	24.0	10	13.5	4	11.1	
Educational level	Illiterate	4	8.0	8	10.8	0	0.0	**0.008**
	Primary	18	36.0	8	10.8	10	27.8	
	Secondary	18	36.0	36	48.6	12	33.3	
	University or Institute	10	20.0	22	29.7	14	38.9	
Financial status	Sufficient	23	46.0	42	56.8	15	41.7	0.418
	Barely sufficient	20	40.0	24	32.4	18	50.0	
	Insufficient	7	14.0	8	10.8	3	8.3	
Number of children	1-2	20	40.0	50	67.6	16	44.4	**0.009**
	3-4	22	44.0	22	29.7	16	44.4	
	≥5	8	16.0	2	2.7	4	11.1	
Birth order	1	12	24.0	18	24.3	6	16.7	**0.02**
	2	9	18.0	32	43.2	10	27.8	
	3	14	28.0	18	24.3	14	38.9	
	4	7	14.0	4	5.4	2	5.6	
	5	8	16.0	2	2.7	4	11.1	
Total		50	100.0	74	100.0	36	100.0	

Table (5) displays that there is statistical significant association between the mother's level of knowledge on child's language development with their age, level of education, number of children and child's birth order(P≤0.05), but no significant association with their financial status(P≥0.05).

Table (6): Association between sample Socio demographic characteristics and Mother's Level of Knowledge in term of social domain.

Socio demographic characteristics		**Score of knowledge social and emotional development**						**p-value**
		Poor		**Fair**		**Good**		
		Fr.	**%**	**Fr.**	**%**	**Fr.**	**%**	
Age	19-28	16	24.2	12	33.3	22	37.9	0.101
	29-38	34	51.5	18	50.0	32	55.2	
	≥ 39	16	24.2	6	16.7	4	6.9	
Educational level	Illiterate	2	3.0	4	11.1	6	10.3	0.414
	Primary	18	27.3	8	22.2	10	17.2	
	Secondary	24	36.4	16	44.4	26	44.8	
	University or Institute	22	33.3	8	22.2	16	27.6	
Financial status	Sufficient	29	43.9	19	52.8	32	55.2	0.735
	Barely sufficient	28	42.4	14	38.9	20	34.5	

	Insufficient	9	13.6	3	8.3	6	10.3	
Number of children	1-2	30	45.5	18	50.0	38	65.5	0.118
	3-4	30	45.5	16	44.4	14	24.1	
	≥5	6	9.1	2	5.6	6	10.3	
Birth order	1	12	18.2	10	27.8	14	24.1	0.15
	2	19	28.8	8	22.2	24	41.4	
	3	24	36.4	10	27.8	12	20.7	
	4	5	7.6	6	16.7	2	3.4	
	5	6	9.1	2	5.6	6	10.3	
Total		66	100.0	36	100.0	58	100.0	

Table (6) represents the association between the mother's level of knowledge toward the child's social/emotional developmental milestones and sample socio demographic characteristics, as it shows that there is no statistically significant association between the mother's levels of knowledge toward the child's social/emotional developmental milestones with all sample characteristics that mentioned in the above table (P≥0.05).

4. DISCUSSION

The socio-demographic backgrounds of the mothers in this research are a heterogeneous group with different educational levels, economic status, and family structures offer important insights into the elements that may affect their understanding, beliefs, and behaviors regarding child development. Moreover, those factors significantly influence their ability to access resources and information related to child development.

The results demonstrated widespread presence of "fair" knowledge across all areas suggests that many mothers have a fundamental understanding but lack detailed insights into specific developmental milestones particularly in the areas of cognitive, language, and social/emotional development, comparatively, higher percentage of "good" knowledge in motor development likely stems from the more visible and concrete nature of motor skills. Similarly, a study conducted on 195 mothers in India by Joshi and Mihir Rupani in 2019, showed that mothers had fair knowledge on child's developmental milestones. In addition, results of another study conducted by Alqurashi, et al, in 2021 on 400 Saudi mothers showed fair knowledge regarding childrearing and developmental milestone

The findings clearly demonstrate that maternal knowledge is influenced by age as younger mothers had the lowest rates of good knowledge, whereas knowledge scores improved with age, peaking in the 29-38-year age group. This trend suggests that as mothers grow older, they may acquire more experience, access better information, and become more involved in child development activities. Additionally, mothers aged 39 and above exhibited the lowest good knowledge levels, which could be indicative of challenges such as limited engagement with child development resources or the responsibilities that come with having older children. A study done on 358 mothers in Riyadh, Saudi Arabia by Al Darsoni and Al Shehri in 2020, there was a distinct correlation between educational attainment and levels of knowledge, other factors—like age, income, and number of children—did not affect the scores.

Mothers' knowledge regarding motor, cognitive, and social/emotional development did not show a statistically significant correlation with education, conversely, language development knowledge demonstrates a significant correlation. Importantly, the distribution of knowledge scores across different educational levels varies greatly among the four domains, however the levels of knowledge goes up with higher level of education of all the four aspects, these findings goes with the a study done by Habbash, et al, 2022, which reported that Parents who completed below secondary education demonstrated lower awareness of developmental milestones. This result is inconsistent with a study done on 95 mothers by Anushka and Srinivasan in 2024 in western India, the results display that educational attainment was recognized as a factor influencing awareness, with significant links found at different milestones, with the exception of motor development. In addition, this result went against the findings of a study done by Aldayel et al, 2020 in Saudi Arabia, which showed a strong correlation between understanding of motor development and their level of education. Naturally, parents with higher education levels find it easier to obtain reliable information regarding children's development. Studies indicate that, among all significant socio-demographic factors, a parent's educational attainment has the most substantial impact on a child's development (González, et al, 2020).

The results revealed that limited financial resources are associated with lower knowledge levels on motor development.

However, this correlation is not evident for cognitive, language, or social/emotional development. Interestingly, mothers having “barely sufficient” finances tend to have a higher percentage of “fair” and “good” knowledge in all areas of development, implying that this financial affair might play a mediating role. This finding prompts a deeper exploration of the unique challenges and strategies linked to a “barely sufficient” financial situation, which may motivate mothers to actively pursue and keep child development information. On the other hand, "insufficient" financial resources seem to predominantly affect knowledge of motor development, possibly due to restricted access to resources that are essential for physical growth. The p-values for cognitive knowledge (0.357), language knowledge (0.418), and social/emotional knowledge (0.735) show no significant relationships between financial status and maternal knowledge in these areas. This may indicate that, while financial conditions can impact understanding in areas that require physical resources (like motor development), cognitive, language, and social/emotional knowledge might be more influenced by other elements, such as access to professional guidance. This indicates that financial security may afford mothers greater access to tools such as educational materials, healthcare services, and child development programs, thus improving their comprehension of developmental milestones.

The effect of having multiple children on a mother’s understanding is specific to certain areas, and higher parity may adversely influence knowledge about language and cognitive growth. This could be attributed to the greater demands and distribution of resources that come with larger families, which might restrict access to information on development or decrease the time available for concentrated interactions with each child as similar to motor and social/emotional development. Concerning parity, there was a notable correlation between mothers' understanding of children's developmental milestones in motor, and language aspects and the number of babies delivered in a similar study done by Alkhazrajy and Aldeen,2017, in Iraq which contrasts with the 2015 study that found no significant correlation (Safadi et al., 2016).

There is a significant connection between a child's birth order and the mother's understanding of child developmental milestones, with important findings across motor, cognitive, and language knowledge areas. As the birth order increases, there appears to be a tendency towards higher maternal knowledge in specific domains. This may suggest a lack of experience or available resources during the initial phases of motherhood. In contrast, mothers of second and third-born children display heightened knowledge, particularly in motor skills, as well as cognitive knowledge indicating that the experience from raising older siblings enhances their awareness of developmental milestones. On the other hand, mothers of later-born children (birth orders 4 and 5) show more variation, with some attaining high knowledge levels, especially in language and motor skills. The p-values (0.014, 0.008, and 0.02) demonstrate statistically significant correlations in motor, cognitive, and language knowledge, affirming the hypothesis that maternal experience with subsequent children leads to improved understanding of child development.

5. CONCLUSIONS

Based on findings, most of the mothers had fair level of knowledge; in contrast, least of them had good knowledge. Mother’s age, influence, motor, cognitive, and language domains. Their level of education influence language domain and financial status affect only motor development. Moreover, there is association between number of children and language domain, while child’s ranking in family associated with motor, cognitive, and languages domains .

6. RECOMMENDATIONS

There is a need of raising mother knowledge about child’s developmental milestone through implementing educational sessions to be able to distinguish any delay or deviation from the normal milestone line. In addition, persuading and encouraging them to attend reproductive and child growth monitoring units in the primary healthcare centers according to the proposed schedule to be updated on their developmental milestones’ progression.

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