

Nutritional knowledge, attitudes and practices among women of reproductive age in the United Arab Emirates: a cross-sectional study

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Abstract

Background

Adequate maternal nutrition is important for maternal and fetal health, yet gaps in nutritional knowledge and dietary practices may persist among women of reproductive age. Evidence from the United Arab Emirates (UAE) remains limited regarding knowledge, attitudes and practices related to pregnancy nutrition.

Aim

To assess nutritional knowledge, attitudes and practices related to pregnancy among women of reproductive age in the UAE and examine their associations with selected sociodemographic and reproductive characteristics.

Methods

A descriptive cross-sectional study was conducted in early 2024 among 395 women aged 18–49 years residing in the UAE. Data were collected using a structured, self-administered online questionnaire comprising 42 items covering sociodemographic characteristics, nutritional knowledge, attitudes and practices. Knowledge and practice scores were classified using a 70% threshold, while attitudes were classified relative to the mean. Data were analysed using SPSS version 29 with descriptive and inferential statistical tests.

Introduction

Nutrition is a cornerstone of human health and development. Adequate intake of essential nutrients supports multiple aspects of growth, including physical and cognitive development, mental health, and reproductive capacity. Human development begins in utero; therefore, maternal nutrition during pregnancy plays a critical role in fetal growth from the earliest stages of life. Insufficient maternal nutrition has been associated with adverse pregnancy outcomes such as low birth weight and preterm delivery, while excessive or imbalanced nutrition may increase the risk of complications including macrosomia and gestational hypertension [1, 2]. Consequently, adequate knowledge of maternal nutrition and an understanding of the consequences of poor nutritional knowledge, attitudes, and practices (KAP) among women of childbearing age are essential for healthcare providers to develop effective antenatal care strategies [2, 3].

Pregnancy is accompanied by significant physiological changes that increase nutritional requirements to support fetal growth and maternal health. To meet these demands, pregnant women require increased energy intake and adequate consumption of macronutrients, including proteins, fats, and carbohydrates.

In addition, several micronutrients—particularly folate, vitamin B12, and iron—are critically important during pregnancy. Folate is essential for DNA synthesis and neural tube development, vitamin B12 supports red blood cell formation and neurological function, and iron is necessary for oxygen transport and the prevention of maternal anemia [1, 4]. Inadequate intake of these micronutrients has been linked to an increased risk of neural tube defects, low birth weight, preterm birth, and maternal anemia [1, 3]. Conversely, excessive intake may also result in adverse outcomes, highlighting the importance of maintaining a balanced and appropriate diet during pregnancy [2, 3].

Emerging evidence suggests that maternal nutrition may influence long-term offspring health through epigenetic modifications, potentially increasing susceptibility to chronic conditions such as type 2 diabetes, hypertension, and obesity later in life [1, 4]. These findings emphasize that proper maternal nutrition not only affects immediate pregnancy outcomes but also contributes to the long-term health of future generations. Therefore, attention to the quality, adequacy, and diversity of maternal dietary practices throughout pregnancy is essential to promote optimal maternal and child health [3, 4].

Despite the well-established importance of proper nutrition during pregnancy, studies worldwide continue to report significant gaps in nutritional knowledge and the presence of misconceptions among pregnant women. Poor awareness of nutritional risks can lead to serious adverse outcomes for both mothers and infants. Key determinants influencing maternal nutritional awareness include educational level, socioeconomic status, cultural practices, and access to healthcare services. Addressing these factors is critical, underscoring the important role of the healthcare system in improving maternal education and awareness [2, 3]. Accordingly, counseling and educational interventions that assess maternal KAP are necessary to inform effective dietary strategies during pregnancy [2, 4].

The United Arab Emirates (UAE) is characterized by a culturally diverse population with varying dietary habits, which may contribute to differences in maternal nutritional knowledge and practices. Although the UAE has a well-developed healthcare system and multiple policies aimed at improving maternal and child health, existing evidence suggests that nutritional practices among women of childbearing age vary widely, and local data on current behaviors remain limited [2, 4]. Understanding women's awareness and nutritional behaviors during pregnancy is therefore crucial to identifying gaps and informing targeted interventions that support healthier future generations.

In light of this context, the present study aims to assess the knowledge, attitudes, and practices related to dietary behaviors among women of childbearing age in the UAE, with particular emphasis on folate, vitamin B12, and iron. By identifying areas of misinformation and insufficient awareness, this research seeks to guide healthcare providers and policymakers in developing targeted educational programs and strategies to improve maternal nutrition. Such interventions have the potential to enhance pregnancy outcomes and promote optimal maternal and child health in the UAE [1–3].

Methodology

Study Design:

This study employed a descriptive cross-sectional design. Data were collected using a self-administered online questionnaire that assessed participants' demographic characteristics and their knowledge, attitudes, and practices related to dietary habits among women of childbearing age. A cross-sectional design was considered appropriate as it enables the collection of data from a large population at a single point in time in a rapid and cost-effective manner. Additionally, this design allows for the examination of multiple variables concurrently and supports the identification of potential needs for public health awareness interventions.

Study Population and Sampling:

The target population comprised women of childbearing age (18–49 years). Data collection was conducted in early 2024 using a structured, self-administered online questionnaire adapted from a previously published questionnaire assessing knowledge, attitudes, and practices towards nutrition and diet among recently delivered Syrian refugee women [5]. The questionnaire used in the present study consisted of 42 items distributed across four sections: demographics (10 items), knowledge (15 items), attitudes (9 items), and practices (8 items). A non-probability convenience sampling method was used to recruit Arabic- and English-speaking women aged 18–49 years residing in the United Arab Emirates (UAE). The minimum required sample size was calculated to be 385 participants. This number was increased to 440 to account for potential non-responses and incomplete questionnaires.

Inclusion and Exclusion Criteria

Eligible participants included women residing in the UAE who were aged 18 years and above and able to read and understand Arabic or English. Women aged 50 years and above were excluded. Participants with no history of pregnancy were excluded from the practices section, as these items specifically addressed behaviors during pregnancy.

Ethical Considerations

Ethical approval

was obtained from the Research Ethics Committee of the University of Sharjah (REC-24-01-26-03-S). Participation was voluntary, and informed consent was obtained electronically from all participants. Data were collected anonymously and treated with strict confidentiality.

Scoring and Categorization

For the knowledge domain, participants were classified into two groups based on their total scores. A score of $\geq 70\%$ correct responses was considered indicative of adequate knowledge, whereas scores $< 70\%$ were classified as inadequate knowledge [6].

Attitudes were categorized based on the mean attitude score. Participants scoring above the mean were considered to have favourable attitudes, while those scoring below the mean were classified as having unfavourable attitudes [6].

For the practices domain, a cutoff score of 70% was applied. Participants scoring $\geq 70\%$ were categorized as having good nutritional practices, while those scoring $< 70\%$ were categorized as having poor nutritional practices during pregnancy [6].

Data Analysis

Data were analyzed using SPSS version 29. Descriptive statistics, including means, frequencies, and percentages, were calculated. Inferential analyses included the Chi-square test, Mann–Whitney U test, Kruskal–Wallis test, and Spearman’s correlation coefficient. Statistical significance was defined as a p -value ≤ 0.05 .

Results

Participants’ Demographics: A total of 395 women residing in various cities across the United Arab Emirates (UAE) participated in the study. Participants ranged in age from 18 to 49 years and were categorized into three age groups: young adults (18–24 years), early adults (25–34 years), and middle-aged adults (35–49 years). Young adults constituted the largest proportion of the sample, accounting for 44% of participants (Table 1).

More than half of the participants ($n = 251$) held a university degree. Marital status was relatively evenly distributed, with 200 participants reporting having been married at some point. In terms of reproductive history, 183 women reported having experienced pregnancy, and 177 indicated that they had children (Table 1).

Participants represented a range of occupational backgrounds. Students comprised the largest group ($n = 152$), followed by employed women ($n = 125$), housewives ($n = 79$), and unemployed participants ($n = 39$). Geographically, most participants resided in Dubai ($n = 146$) and Sharjah ($n = 127$), while others lived in Abu Dhabi ($n = 58$) or the northern emirates (Table 1).

Household income varied considerably among participants, with 138 women reporting a monthly income exceeding 15,000 AED. However, a substantial proportion of respondents ($n = 133$) preferred not to disclose their income (Table 1).

Table 1

– Participants' demographics and characteristics. Values reflect Number (n) of participants in each category. (RAK = Ras Al Khaima).

		n total = 395
Age	Young adults (18–24)	172
	Early adulthood (25–34)	87
	Middle-aged adults (35–49)	136
Having a university degree	Yes	155
	No	43
Marital status	Ever married	200
	Single	195
Pregnancy status	Was/ currently is pregnant	183
	Never	212
Number of child/ren	None	218
	1	26
	2	72
	3	10
	+ 4	69
Occupation	Student	152
	Housewife	79
	Employed	125
	Unemployed	39
City of residency	Abu Dhabi	58
	Dubai	146
	Sharjah	127
	Others (Ajman, RAK, Fujairah, Umm Al Quwain)	63
Family monthly income	Less than 5,000	32
	5,000–9,999	46
	10,000–15,000	46
	More than 15.000	138

Knowledge of Nutritional Needs During Pregnancy

Among all respondents, only 29% met the criteria for being categorized as knowledgeable about prenatal nutrition, while 71% scored below the established threshold. This distribution was statistically significant ($p < 0.001$), indicating a substantial gap in nutritional awareness among women of childbearing age (Fig. 1).

Figure (1) illustrates the distribution of participants according to nutritional knowledge status. A binomial test demonstrated a statistically significant difference between knowledgeable and non-knowledgeable groups ($p < 0.001$).

Age was significantly associated with nutritional knowledge levels. Younger participants aged 18–24 years demonstrated consistently higher knowledge scores compared with older age groups, while middle-aged women (35–49 years) exhibited the lowest levels of knowledge. More than 83% of respondents in the middle-aged group were classified as non-knowledgeable, indicating a decline in nutrition-related knowledge with increasing age ($p < 0.001$) (Fig. 2).

Figure (2) illustrates the distribution of nutritional knowledge levels across different age groups. A chi-square analysis revealed a statistically significant association between age and knowledge level ($p < 0.001$).

Contrary to expectations, previous pregnancy experience was not associated with higher nutritional awareness. Women who had never been pregnant demonstrated significantly higher knowledge scores than those who had experienced pregnancy ($p < 0.001$). Similarly, participants without children showed greater nutritional knowledge compared with those who had multiple children ($p < 0.05$) (Fig. 3). **Fig. (3)** illustrates the association between nutritional knowledge level and the presence of one or more children. A chi-square test revealed a statistically significant difference in knowledge levels between the two groups ($p = 0.001$).

Geographic location was significantly associated with nutritional knowledge. Women residing in Dubai and Abu Dhabi demonstrated higher knowledge scores compared with those living in other emirates ($p < 0.05$) (Fig. 4). Relationship status was also significantly related to knowledge levels, with single participants exhibiting greater nutritional knowledge than married participants ($p = 0.002$). This difference in knowledge scores was highly significant ($p < 0.001$).

Figure (4) presents the distribution of participants with good and poor nutritional practices during pregnancy according to the city of residency. The association between practice quality and city of residency was assessed using a chi-square test, which demonstrated a statistically significant relationship ($p = 0.014$).

Occupational status was significantly associated with nutritional knowledge, with students emerging as the most informed group and demonstrating significantly higher knowledge scores than both housewives and employed women ($p < 0.01$). In contrast, educational level did not show a significant association with knowledge scores, a finding that diverges from trends commonly reported in the literature.

A modest but statistically significant positive correlation was observed between the number of information sources utilized and overall knowledge scores ($p < 0.001$, $r = 0.357$), suggesting that engagement with multiple educational channels may enhance nutritional awareness. Regarding specific micronutrients, awareness of folic acid was high, even among participants classified as non-knowledgeable. However, knowledge of the role of vitamin B12 during pregnancy was limited; more than half of the non-knowledgeable participants incorrectly believed that vitamin B12 was not essential (Fig. 5).

Figure (5) illustrates participants' perceptions of the necessity of the three key supplements examined in this study— (A) iron, (B) folic acid, and (C) vitamin B12—categorized by knowledge status (knowledgeable vs. non-knowledgeable). A statistically significant difference was observed between groups, with a calculated p-value of < 0.001 .

Attitudes

Among the participants, 205 women demonstrated favorable attitudes toward nutrition during pregnancy, while 190 exhibited unfavorable attitudes. This difference was not statistically significant. Knowledge scores were significantly but weakly positively correlated with attitude scores ($p < 0.001$, $r = 0.184$), indicating that higher knowledge was associated with more positive attitudes. Attitude scores also showed a stronger positive correlation with practice scores ($p < 0.001$, $r = 0.339$), suggesting that women with more favorable attitudes were more likely to engage in good nutritional practices. Participants with favorable attitudes were significantly more likely to report good practices, whereas those with unfavorable attitudes were more likely to report poor practices ($p < 0.002$).

Practices

Significant differences were observed between participants exhibiting good and poor nutritional practices ($p < 0.001$). Approximately 73% of participants reported good nutritional practices during pregnancy, representing the majority of the sample, while 27% demonstrated poor practices (Fig. 6).

Figure (6) presents the distribution of participants according to practice levels. A binomial test confirmed a statistically significant difference between individuals exhibiting good and poor practices ($p < 0.001$).

Associations Between Practices and Demographic Factors

Practice scores varied significantly across different cities of residence ($p = 0.018$). Specifically, participants residing in Dubai demonstrated the highest median practice scores, followed by residents of Sharjah. Significant differences were observed between Dubai and Abu Dhabi ($p = 0.009$), as well as between Dubai and residents of other emirates ($p = 0.016$).

A significant association was also found between practice levels and monthly household income ($p = 0.034$). Although higher income was expected to correspond with better practices, this trend was not consistently observed. The highest proportion of women with good practices (approximately 96%) was observed among participants with a family monthly income of 5,000–9,999 AED. Among participants with a monthly income of less than 5,000 AED, 57.1% reported good practices, compared with 75.9% of those with a monthly income above 15,000 AED.

Knowledge level was significantly associated with practice quality ($p = 0.007$). Among knowledgeable participants, 93.9% reported good nutritional practices, whereas 71.2% of non-knowledgeable participants demonstrated good practices. These findings indicate that higher nutritional knowledge is linked to a greater likelihood of engaging in good practices during pregnancy

Discussion

Overall, the study revealed a relatively high level of awareness regarding the need for iron, folic acid, and vitamin B12 supplementation during pregnancy among both knowledgeable and non-knowledgeable participants. However, the degree of recognition varied across the different supplements. Awareness of folic acid was particularly high, consistent with a cross-sectional study in Ghana, where most participants exhibited good awareness of folic acid supplementation despite generally poor nutritional knowledge [7]. In contrast, a study from southern Ethiopia reported low knowledge of folic acid among pregnant women [8].

Compared with iron and folic acid, awareness of the importance of vitamin B12 supplementation was lower, especially among participants classified as non-knowledgeable (Fig. 5C). This aligns with recent findings from Jordan (2024), which reported that nearly half of the study population was unaware of the need for vitamin B12 during pregnancy [9].

Regional studies further support the variability in maternal nutrition knowledge. In Saudi Arabia, Mansour and Hassan [10] reported low overall knowledge about maternal nutrition, with maternal educational status identified as a key influencing factor, consistent with findings in Fig. 1. Similarly, studies in Bahrain indicated that although most women (86%) understood the importance of adequate maternal nutrition, adherence to international dietary recommendations remained suboptimal [11]. Almurshed et al. [12] documented a high prevalence of macronutrient and micronutrient deficiencies among pregnant Saudi women, likely due to limited nutritional knowledge and suboptimal dietary practices. These deficiencies have been linked to adverse maternal and fetal outcomes, including low birth weight and maternal nutrient depletion.

Our findings also revealed notable geographic differences in maternal nutritional practices across the UAE (Fig. 4), challenging the assumption that higher economic prosperity necessarily leads to better adherence to recommended dietary guidelines. Despite Abu Dhabi's strong economic status and advanced healthcare infrastructure, only 59.3% of participants residing there met recommended maternal nutrition practices, highlighting that economic wealth alone is insufficient to ensure optimal maternal nutrition.

Supporting this interpretation, Taha et al. [13] reported that despite high food security in Abu Dhabi, adherence to complementary feeding guidelines remained suboptimal, suggesting that gaps in nutritional knowledge and education, rather than financial constraints, are the primary barriers. Similar trends have been observed internationally. Haque et al. [14] found that approximately three-quarters of mothers in urban Bangladesh exhibited low dietary diversity, even in relatively well-developed areas, underscoring the limited impact of household wealth in the absence of effective dietary counseling and nutrition education. Likewise, Weil et al. [15] demonstrated in Burkina Faso that higher income did not necessarily translate into healthier dietary patterns; instead, increased income was often associated with greater consumption of energy-dense, processed foods. This phenomenon reflects the broader "nutrition transition," in which economic development shifts populations away from traditional, balanced diets toward processed and refined foods.

The high prevalence of good practices observed in this study (Fig. 6) may be partially explained by socioeconomic factors, including access to healthcare services, educational attainment, and proximity to healthcare facilities. Previous research has consistently demonstrated that socioeconomic status strongly influences health-related behaviors. Caron et al. [16] reported that individuals living in communities with higher socioeconomic conditions are more likely to engage in positive health behaviors. Similarly, Pampel et al. [17] found that higher educational attainment and economic resources are associated with healthier lifestyle choices. Additionally, the widespread availability of health information and public health resources may have contributed to the high proportion of good practices observed. Caron et al. [16] also noted that increased access to healthcare services and public health information during the COVID-19 pandemic was associated with improved health-related behaviors. Conversely, individuals with limited resources face greater barriers to maintaining healthy practices.

The age-related trends observed in Fig. 2 are consistent with a study from Saudi Arabia, which reported higher nutritional knowledge among women aged 19–35 years [18]. The significant association between age and knowledge ($p < 0.001$) may reflect differences in recent educational exposure and access to health-related information. Younger women are more likely to have received contemporary pregnancy nutrition education and to be exposed to public health campaigns, including those disseminated through social media and formal curricula. In addition, younger individuals typically demonstrate greater proficiency in using digital technologies to access health information, supporting their higher knowledge levels. This interpretation aligns with research in the UAE highlighting the use of social media by adolescents and young adults to obtain health-related information [19].

The findings shown in Fig. 3 align with results from Saudi Arabia [10], where a negative association was observed between parity and maternal nutrition knowledge. Low educational levels and adherence to cultural beliefs—such as attributing health outcomes to the “evil eye” rather than personal health behaviors—were suggested as contributing factors. In the present study, a statistically significant relationship was found between the number of children and knowledge level ($p = 0.028$). Participants without children had the highest proportion of being knowledgeable (33.3%), whereas those with two children had the lowest proportion (19.4%). Individuals with one or more children consistently exhibited higher rates of being classified as non-knowledgeable compared with participants without children. Changing fertility patterns in the Arabian Gulf, including shifts in age at marriage and family size, provide additional demographic context for these findings [20]. Similar associations have been reported in European populations, including the Czech Republic, where parity was identified as a factor influencing nutritional knowledge and health behaviors during pregnancy [21].

Conclusion

This study revealed notable differences in knowledge, attitudes, and practices related to nutrition during pregnancy among women of childbearing age in the United Arab Emirates. Higher levels of nutritional knowledge were observed among students and younger women, likely reflecting greater exposure to recent educational initiatives and enhanced access to digital and social media platforms. Although the majority of participants demonstrated good nutritional practices, overall knowledge levels remained suboptimal, highlighting a persistent gap in maternal nutritional awareness.

These findings emphasize the need for targeted educational campaigns and public health initiatives to improve maternal nutritional knowledge and promote evidence-based dietary practices during pregnancy. Healthcare professionals play a pivotal role in addressing this gap, given their direct involvement in patient education during both prenatal and postnatal care.

The present study focused on three key micronutrients—iron, folic acid, and vitamin B12—which are essential during pregnancy. However, these do not represent the full spectrum of nutrients critical for maternal and fetal health. Future research should broaden the scope to include additional micronutrients, such as calcium and vitamin D, to provide a more comprehensive assessment of maternal nutritional needs. Furthermore, studies should investigate the role of healthcare providers in maternal nutrition education, including potential gaps in counseling practices and opportunities to enhance provider-led educational interventions.

Abbreviations

KAP: Knowledge, Attitudes, and Practices

UAE: United Arab Emirates

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Research Ethics Committee of the University of Sharjah (REC-24-01-26-03-S). Participation was voluntary, and electronic informed consent was obtained from all participants prior to data collection. All data were collected anonymously and treated with strict confidentiality. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to ethical and confidentiality considerations but are available from the corresponding author upon reasonable request.

Conflict of Interest / Competing Interests

The authors declare that they have no conflicts of interest or competing interests related to this work.

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Author Contributions

.H., O.R., A.A.Z., R.A., A.A., Y.E.A., and M.S. contributed to the study design, data collection, and data entry. F.H., O.R., and A.A.Z. performed the data analysis. F.H. drafted the initial manuscript. O.R., R.A., and Y.E.A. contributed to the interpretation of the results and revision of the manuscript. S.A.-N. supervised the study, contributed to its conceptualization and methodology, critically reviewed and edited the manuscript, and provided overall guidance throughout the research process. All authors read and approved the final manuscript. S.A.-N. is the corresponding author.

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Figures

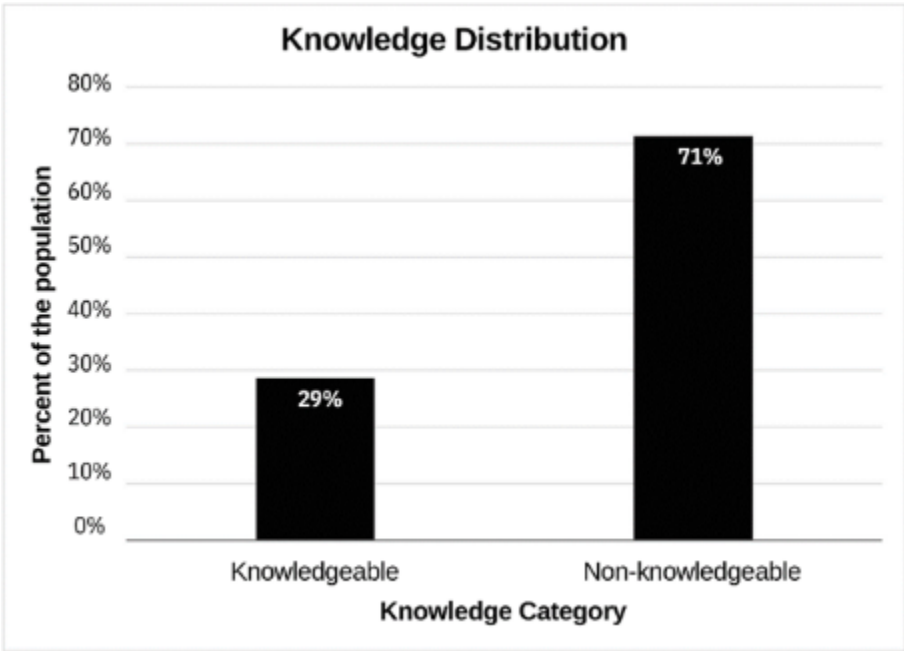


Figure 1

Fig (1) illustrates the distribution of participants according to nutritional knowledge status. A binomial test demonstrated a statistically significant difference between knowledgeable and non-knowledgeable groups ($p < 0.001$).

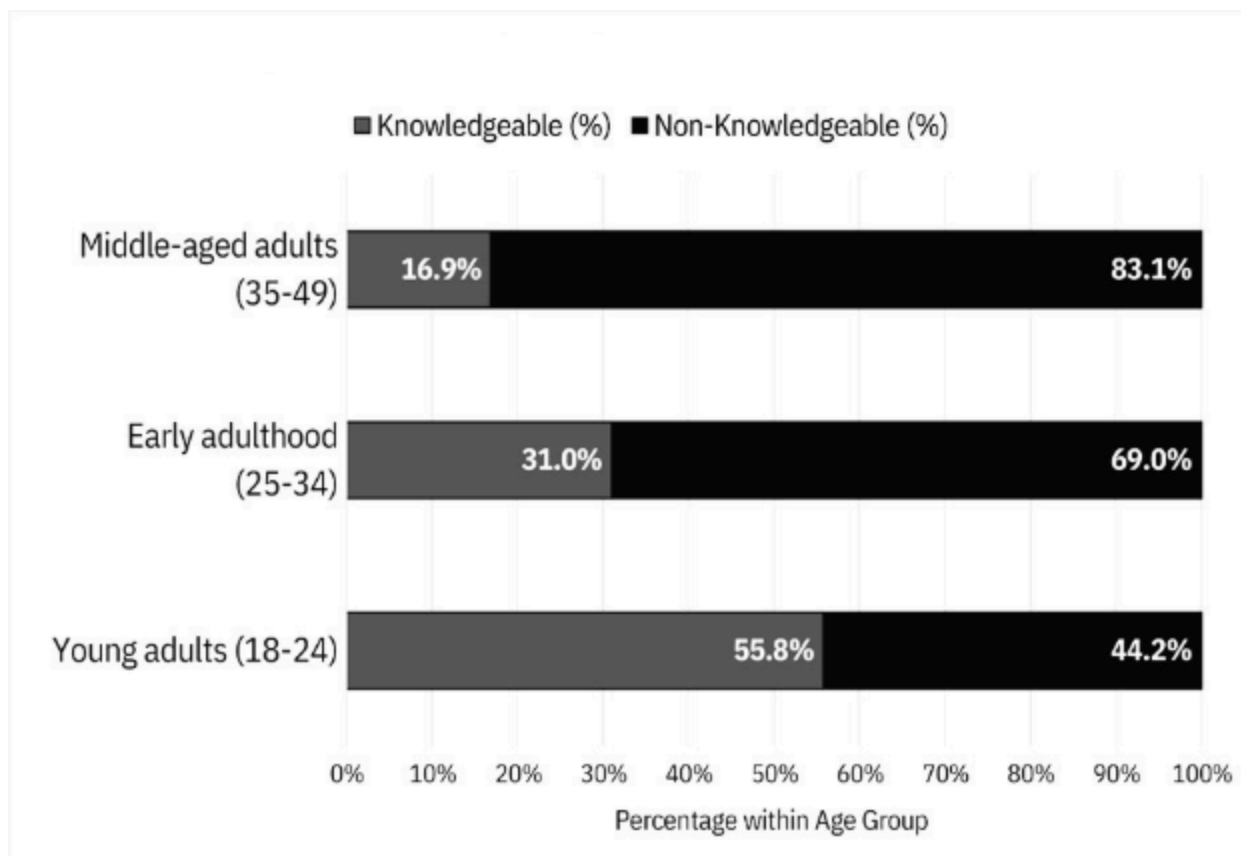


Figure 2

Fig (2) illustrates the distribution of nutritional knowledge levels across different age groups. A chi-square analysis revealed a statistically significant association between age and knowledge level ($p < 0.001$).

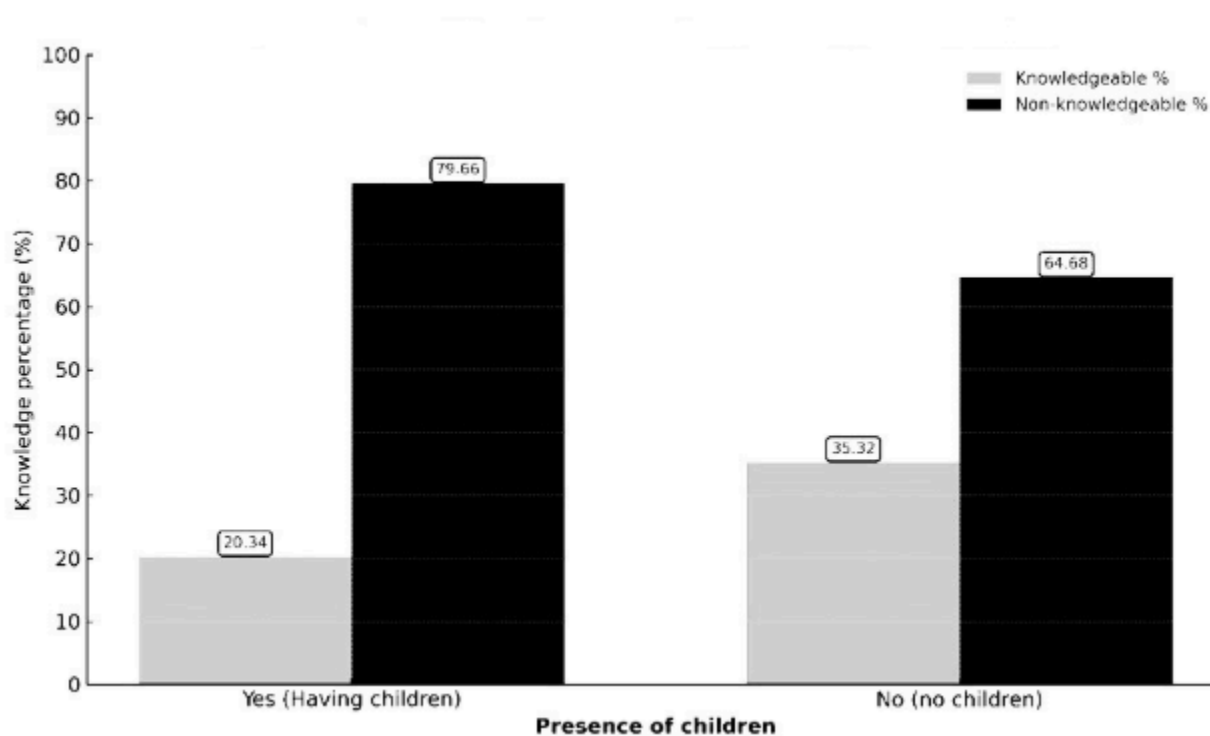


Figure 3

Fig (3) illustrates the association between nutritional knowledge level and the presence of one or more children. A chi-square test revealed a statistically significant difference in knowledge levels between the two groups ($p = 0.001$).

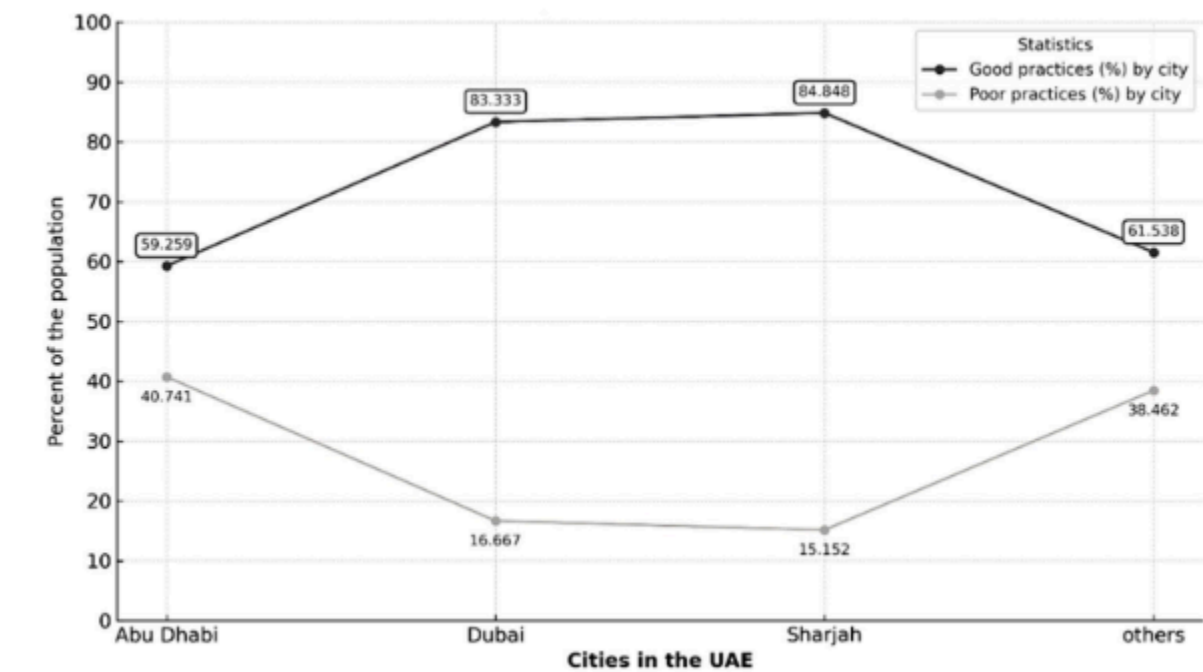


Figure 4

Fig (4) presents the distribution of participants with good and poor nutritional practices during pregnancy according to the city of residency. The association between practice quality and city of residency was assessed using a chi-square test, which demonstrated a statistically significant relationship ($p = 0.014$).

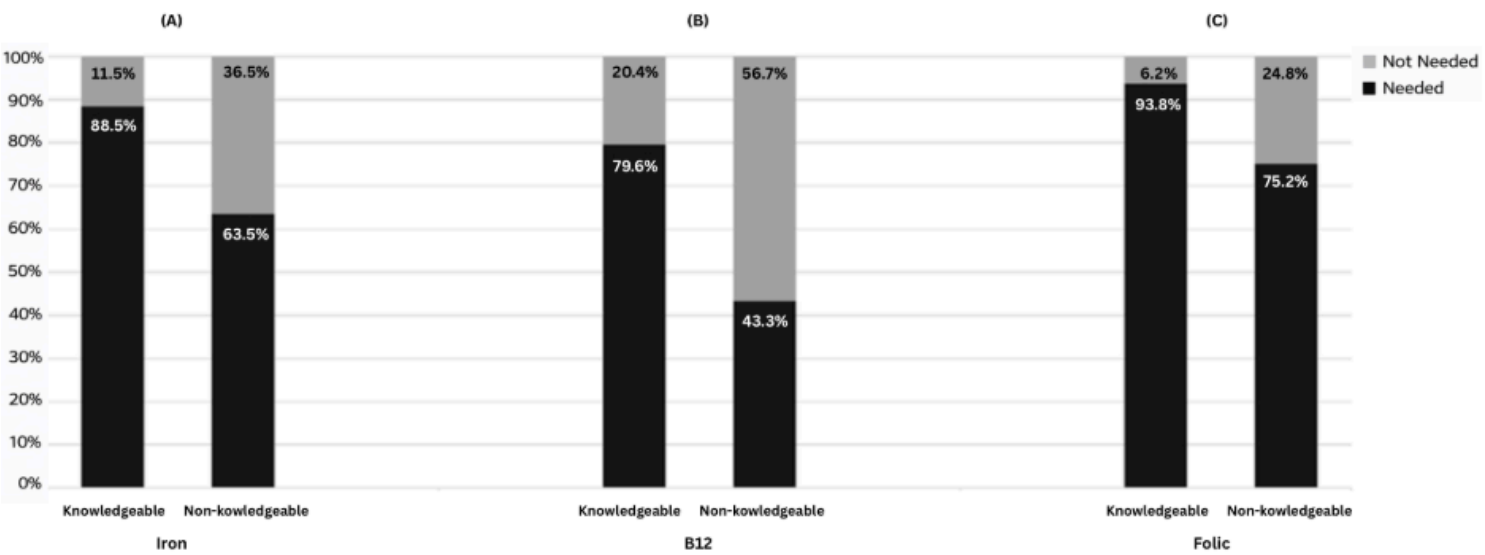


Figure 5

Fig (5) illustrates participants’ perceptions of the necessity of the three key supplements examined in this study— (A) iron, (B) folic acid, and (C) vitamin B12—categorized by knowledge status (knowledgeable vs. non-knowledgeable). A statistically significant difference was observed between groups, with a calculated p-value of <0.001.

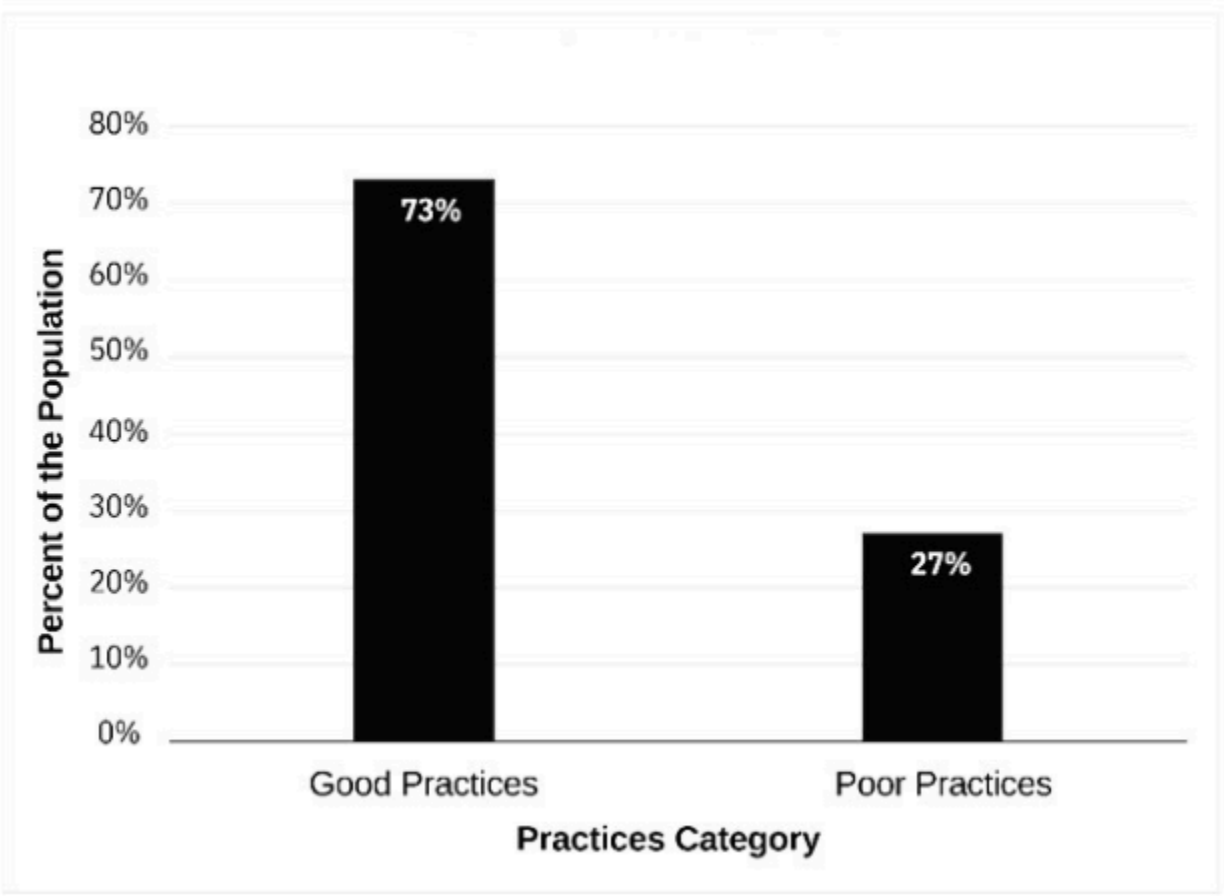


Figure 6

Fig (6) presents the distribution of participants according to practice levels. A binomial test confirmed a statistically significant difference between individuals exhibiting good and poor practices ($p < 0.001$).