

The Relationship between Nurses-Midwives' Knowledge about Vitamin D Deficiency and its Impact upon Feto-Maternal Health Outcome among Pregnant Women and their Demographic Characteristics in Obstetrics and Gynecology Teaching Hospital in Holy Karbala City

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Abstract

Background: The nurses-midwives have vital role to provide health education for pregnant women about vitamin D deficiency during pregnancy and its impact upon feto-maternal health outcomes in order to reduce feto-maternal morbidity.

Objective:

To find out the relationship between nurses-midwives' knowledge about vitamin D deficiency and the impact of vitamin D deficiency upon health of feto- maternal outcomes and their demographical characteristics (age , marital status, level of education, years of experience and participation in training courses).

Methodology of the study: A descriptive cross-sectional study was conducted in Holy Karbala city. The sample of the study was a non-probability (Purposive sample) consisted of one hundred and thirty (130) nurses' mid-wives which were selected from obstetrics and gynecology teaching hospital.

The results: Significant different between nurses-midwives' knowledge about impact of vitamin D deficiency upon maternal health with demographical characteristics educational level at ($p < 0.05$, $p = 0.048$). And significant difference between nurses-midwives' knowledge about causes and risk factors with demographical characteristics regarding training courses related to Vitamin D at ($p < 0.05$, $p = 0.048$). Their significant difference between nurses-midwives' knowledge about prevention of vitamin D deficiency with demographical characteristics regarding training courses related to obstetrics and

gynecology and vitamin D at ($p < 0.05$, $p = 0.048$ & 0.020). And significant different between overall nurses-midwives' knowledge about vitamin D deficiency with demographical characteristics regarding educational level at ($p < 0.05$, $p = 0.001$).

Conclusion: There are significant different between nurses-midwives' knowledge about prevention of vitamin D deficiency with demographical characteristics regarding training course related training courses related to obstetrics and gynecology and vitamin D, and their knowledge about vitamin D toxicity with demographical characteristics regarding age and educational level.

Recommendation: There should be more diversity in the educational level in the obstetrics and gynecological hospitals and Develop plans for training courses about vitamin D and impacts of its deficiency upon feto-maternal health outcomes among nurses- midwives to improve knowledge to provide optimal health care.

Keywords: Vitamin D Deficiency, Feto-Maternal Health, Pregnant Women, Obstetrics, Gynecology, Nursing.

Introduction

Vitamin D refers to a group of fat-soluble steroid hormones that are required for the intestinal absorption of calcium, magnesium, and phosphates, and without which blood levels of these substances will drop. The presence of vitamin D receptors in numerous tissues suggests that they play a broad function in physiology, and hence, possibly, in disease. This will aid the body in maintaining a healthy bone structure. Low calcium levels, possibly due to a lack of vitamin D, cause weakness. The bowing-out of the leg bones, which are unable to bear the weight of the body, is the most common symptom. This is known as osteomalacia in adults and rickets in children (Blann, 2015). It's currently considered to play a role in cell differentiation, proliferation, and immunity. It plays a role in the prevention and treatment of cancer, osteoporosis, rheumatoid arthritis, multiple sclerosis, hypertension, cardiovascular disease, obesity, psoriasis, and psychiatric illnesses (Khadilkar, 2013).

Pregnancy is a key time in a woman's life when she is responsible for both her own health and that of her developing fetus, a process that continues during nursing. The importance of vitamin D level during this time has not been completely acknowledged until recently. Data on the importance of vitamin D in health has emerged, challenging previous dogma and suggesting that vitamin D – through its effect on immune function and surveillance – has a role in the health of both the mother and her

fetus beyond calcium and bone metabolism. This process continues after birth, with the breastfeeding mother continuing to be the primary provider of vitamin D for her baby. Thus, maternal deficiency predicts fetal and child deficiency during pregnancy and breastfeeding (Wagner et al., 2012).

The mobilization of maternal calcium reserves is necessary for fetal skeletal growth during pregnancy. This results in a number of physiological adaptations, including enhanced maternal bone mobilization and intestinal calcium absorption, which are at least partially mediated by 1,25-dihydroxyvitamin D. In the first trimester, total 1,25-dihydroxyvitamin D levels rise, whereas free 1,25-dihydroxyvitamin D levels rise in the third trimester, before reverting to normal throughout the puerperium and lactation. Although the placenta, decidua, and fetal kidneys all express 1 α -hydroxylase, it appears that renal synthesis, which is promoted by prolactin and placental lactogen, plays the most important function. It's worth noting that vitamin D is virtually fully absorbed as a form bound to serum protein, and that vitamin D-binding protein levels rise during pregnancy. Despite this, levels of free 1,25-dihydroxyvitamin D are higher during pregnancy. As a result, maintaining optimal mineral metabolism throughout pregnancy without exposing maternal or fetal bone mass may be difficult for women with vitamin D deficiency (Weinert & Silviero,2014) .

Vitamin D deficiency can be caused by a variety of factors, including factors that limit skin exposure to UVB light (e.g., high latitude residents, dark skin pigmentation), lower Vitamin D dietary intake (e.g., low dietary intake of vegetarian diets or fish and egg yolks), or changes in Vitamin D intake or metabolism (e.g., malabsorption, poor liver or renal function, and obesity) (Tzu-Hui Lo et al., 2019). Vitamin D, a lipophilic hormone, comes in two forms: natural ergocalciferol (vitamin D₂), mainly derived from plant sources via yeast-generated ergosterol radiation through radiation (vitamin D₃), mainly produced in the skin through conversion by ultraviolet B (UVB) radiation. Other sources come from animal products such as fatty fish, mushrooms, egg yolks, liver, and dairy product are also good source. UVB sunlight aids in the conversion of 7-dehydrocholesterol in the skin to pre-vitamin D, which is subsequently isomerized by body heat into vitamin D₃ (cholecalciferol) and delivered to the liver by the blood, where it is transformed to 25-hydroxyvitamin D. (25-OH Vit D) (Judistiani et al., 2019). In the UK, dietary sources of vitamin D are limited and account for only 10–20% of the total body store; natural sources include oily fish, egg yolk, and red meat, while fortified foods include infant and toddler formula milks, some breakfast cereals, and margarines. The majority of vitamin D comes through skin synthesis after exposure to sunshine, yet the necessary wavelength of UV radiation is only available in the United Kingdom (UK) between April and mid-October (Hynes et al., 2017).

Preeclampsia (PE), gestational diabetic mellitus (GDM), insulin resistance, caesarean delivery, hypocalcemia, subclinical myopathy, newborn tetany, hyperbilirubinemia, congenital rickets and infantile rickets, and other fetomaternal effects have all been linked to hypovitaminosis D in pregnancy (Yadav et al., 2018).

Methodology

A descriptive cross-sectional study was conducted in Holy Karbala city. The sample of the study was a non-probability (Purposive sample) consisted of one hundred and thirty (130) nurses' mid-wives which were selected from obstetrics and gynecology teaching hospital. Data was collected through the use of questionnaire instrument which is composed from (57) items and consisted of two parts: first part which consisted from the socio-demographic Characteristics of the nurses –midwives, second part which consisted from nurses – midwives' knowledge about vitamin deficiency and its impact upon feto-maternal health outcomes among pregnant women which composed from (57) items.

The validity of the questionnaire was accomplished throughout a panel (15) of experts. A pilot study was conducted to determining the reliability of the study instrument, a pilot study was carried out on (10) nurses who were randomly selected. The nurses in the pilot study had the same criteria of the original study sample. The sample of the pilot study excluded from the original study sample.

Results and Discussion

Part one: discussion of the socio-demographic characteristics of the study sample(Table:1)

1. Age

Findings of present study revealed that the highest percentage of nurses-midwives represented (30%) their age range between (20-24) and (25 – 29) years old respectively. These findings go along with Hasan, Ali and Hussein (2020) which revealed that the highest percentage (25%) of the nurses-midwives' were (20-24) years old. Furthermore, disagree with results obtained in Ma'ala and Khudhair (2012) which showed that most of study participants (30%) were of age (30-39 years).

2. Educational level

The highest percentage of nurses- midwives represented (49.2%) were graduated from midwifery secondary school. This supported in a quasi -experimental "pre-test- post-test" design study done by Ali and Bahaaldeen (2019) point out that the majority of the sample are secondary midwife graduate

level, and they are account for 56 (57.7%), of the total sample. But, disagree with results obtained in Seger, Abbas and Hamad (2019) which showed that the highest percentage (n= 13, 26.0%; n= 12, 24.0%) of the participants were graduated from nursing secondary school and (n= 10, 20.0%; n= 8, 16.0%) were midwifery secondary school graduate. With Respect to all educational levels of the participants there should be a diversification in the educational level of the nurses- midwives to provide optimum care to women.

3. Social status

The highest percentage of nurses- midwives represented (73.8%) were married. This goes in the same line with Ma'ala and Khudhair (2012) which revealed that (65%) of nurses are married. Moreover, agree with Thamer and Abbas (2014) mentioned that most of study sample (65.7%) were married. Founded this high percentage of study sample are married is considered typical because of it is a traditional attitude in Iraq to marry at early years of age.

4. Experience in the nursing field

The highest percentage of nurses- midwives represent (48.5%) were (Five years or Less) years in the nursing field. This supported by results obtained in Hasan, Ali and Hussein (2020) which showed that highest percentage (86.4%) of the sample having less than (5) years of experience in nursing. As well comes in the same line with Muzeya (2015) which demonstrated that most of the participants (40%; 37.8%) had below two years of experience to 5 years respectively. Finding high percentages of study sample who having five or less than five years of experience in nursing field gives an indication that nurses- midwives are newly working as a beginner in their nursing profession in this hospital setting, additionally may be there is continuous staff movement whether inside or outside the hospital.

5. Experience in the obstetrics and gynaecology

The highest percentage of nurses- midwives represent (51.5%) their experience were within (five years or less). This supported by Ahjil and Maala (2012) which point out that most of participants have (1-5) years of experience in obstetrics and gynaecology. Additionally, agree with Oleiwi and Abbas (2018) which revealed that the highest percentage (49.3%; 40.0%) respectively of the study sample have (1-5) years' experience in the obstetric wards. With respect to those few years of experience in the

obstetrics and gynaecology wards, more years of experience may contribute to provide high quality care and better women education which improve and enhance their outcomes.

6. Training courses (general and specific)

Regarding training courses related to obstetrics and gynaecology, the results showed that the highest percentage of nurses- midwives represent (107%) were participated in this training. Additionally, about training courses related to vitamin D; the results revealed that low percentage of nurses- midwives represent (12%) were participated in this training. A study done by Rasheid and Ali (2010) disagree with this results which mentioned that (30.7 %) of nurses- midwives do not attend any training courses related to midwifery during their experiences. According to specified training courses, a quasi-experimental study by Mohamed, Desoky and Metwally (2019) supported these results which showed that the majority (86.7%) of nurses hadn't attended any training courses. Accordingly there is no doubt that the training courses have a great impact on improving nurses- midwives knowledge. Lack of training courses regarding vitamin D3 gives a strong suggestion of their lack of knowledge of the same topic.

Part two: discussion of the relationship between Nurses-Midwives' Knowledge regarding vitamin D deficiency with their demographical characteristics (Table:2,3,4)

The study findings revealed that there are significant association between nurses-midwives' knowledge about vitamin D deficiency with demographical characteristics regarding educational level at ($p < 0.05$). Furthermore, significant difference between nurses-midwives' knowledge with demographical characteristics regarding training courses related to vitamin D at ($p < 0.05$) as offered in table (4-8) and (4-9). Moreover, significant difference between nurses-midwives' knowledge related to prevention of vitamin D deficiency with demographical characteristics regarding age. Besides the results showed no significant relationship of other demographic characteristics with domains regarding vitamin D deficiency.

These findings come to an agreement with results obtained by Faris (2014) in a descriptive study carried out in in Kerbela, Iraq; which showed that there is a significant association between nurses' knowledge and their educational level, experience and general training courses. Another study done by Ahjil and Maala (2012) agree with the results of the current study in that there is significant association between educational level and their knowledge scores, however disagree with the study in

that there is no significant association between participants age and their knowledge scores. Additionally agree with Niazi (2020) which concluded that there is significant relationship between nurses- midwives educational level and training courses (at p-value ≤ 0.05).

Conclusions and recommendations

The highest percentage of nurses-midwives were age between (20-24) and (25-29) year. Most of nurses-midwives were married. High percent were midwifery secondary school level of education in nursing. Most of nurses-midwives experience in the nursing field and in the obstetrics and gynecology (5 years and and less). High percentage of nurses-midwives were participated in training courses related to obstetrics and gynecology and low percentage were participated in training courses related to vitamin D. There are significant different between nurses-midwives’ knowledge about impact of vitamin D deficiency upon maternal health with demographical characteristics regarding educational level and their knowledge about causes and risk factors of vitamin D deficiency with demographical characteristics regarding training course related to vitamin D.

There are significant different between nurses-midwives’ knowledge about prevention of vitamin D deficiency with demographical characteristics regarding training course related training courses related to obstetrics and gynecology and vitamin D, and their knowledge about vitamin D toxicity with demographical characteristics regarding age and educational level. There should be more diversity in the educational level in the obstetrics and gynecological hospitals.

Table (1): Socio demographic Characteristics for Study Sample

Socio demographic Variable	Study sample (N=130)		
	F.	%	Cumulative Percent
Age			
20 -24	39	30.0	30.0
25 – 29	39	30.0	60.0
30 -34	21	16.2	76.2
35 -39	13	10.0	86.2
40 – 44	9	6.9	93.1
45 – 49	6	4.6	97.7
50 years and more	3	2.3	100.0

Educational level				
Nursing secondary school		27	20.8	20.8
Midwifery secondary school		64	49.2	70.0
Higher Institute of Health Professions		19	14.6	84.6
Institute of Medical Technology		3	2.3	86.9
Collage of Nursing		17	13.1	100.0
Social status				
Married		96	73.8	73.8
Single		27	20.8	94.6
Divorced		4	3.1	97.7
Separate		3	2.3	100.0
Experience years in the nursing field				
Five years and Less		63	48.5	48.5
6 -10		44	33.8	82.3
11 -15		14	10.8	93.1
16 – 20		3	2.3	95.4
21 – 25		3	2.3	97.7
26years and More		3	2.3	100.0
Experience years in the Obstetrics and gynecology				
5 years or Less		67	51.5	51.5
6 -10		39	30.0	81.5
11 -15		17	13.1	94.6
16 – 20		1	.8	95.4
21 – 25		4	3.1	98.5
26 years and more		2	1.5	100.0
Training courses by the study sample				
Training courses related to Obstetrics and gynecology.	No	23	17.7	17.7
	Yes	107	82.3	100.0
Training courses related to Vitamin D .	No	118	90.8	90.8
	Yes	12	9.2	100.0

F: Frequency, %: Percentage, N: Sample size

Table (2): Association between Nurses-Midwives' Knowledge Related to Vitamin D deficiency and Their Socio-demographic Variables.

Demographical Characteristics	Vitamin D Deficiency				Causes and Risk Factors				Impact of Vitamin D deficiency upon Maternal Health			
	Chi-square test				Chi-square test				Chi-square test			
	X ²	df	P-value	Sig.	X ²	df	P-value	Sig.	X ²	Df	P-value	Sig.
Age/Years	3.986	6	0.679	NS	1.698	3	0.637	NS	7.522	6	0.275	NS
Social status	0.209	3	0.976	NS	1.698	3	0.637	NS	3.575	3	0.311	NS
Educational Level	6.277	4	0.179	NS	5.089	4	0.278	NS	11.518	4	0.021	S
Experience years in the nursing field	1.848	5	0.870	NS	6.460	5	0.264	NS	6.882	5	0.230	NS
Experience years in the obstetrics and gynecology	1.147	5	0.950	NS	7.214	5	0.205	NS	6.198	5	0.287	NS
Training courses by the study sample												
Training courses related to Obstetrics and gynecology	0.067	1	0.796	NS	0.795	1	0.373	N.S	0.015	1	0.904	N.S
Training courses related to Vitamin D	0.367	1	.545	NS	3.924	1	0.048	S	0.047	1	.829	NS

X²: Chi-square, DF: Degree of freedom, p-value: Probability Value.

Table (3): Association between Nurses-Midwives' Knowledge related to Nutritional of Vitamin D and their demographical characteristics

	Nurses-Midwives' Knowledge related to Source of Vitamin D and Nutritional Riche it
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Demographical Characteristics	Chi-square test			
	X ²	Df	P-value	Sig.
Age/Years	2.312	6	0.889	NS
Social status	2.211	3	0.530	NS
Educational Level	2.370	4	0.668	NS
Experience years in the nursing field	3.843	5	0.572	NS
Experience years in the obstetrics and gynecology	5.336	5	0.376	NS
Training courses by the study sample				
Training courses related to Obstetrics and gynecology	0.105	1	0.746	NS
Training courses related to Vitamin D	0.048	1	0.827	NS

X²: Chi-square, DF: Degree of freedom, p-value: Probability Value, p-value: Non Significant (more than 0.05), Significant: (less than 0.05), Sig: Significant, S: Significant, NS: Non-Significant.

Table (4): Association between Overall Nurses-Midwives' Knowledge about Vitamin D Deficiency and their demographical characteristics.

Demographical Characteristics	Nurses-Midwives' Knowledge related to Vitamin D deficiency.			
	Chi-square test			
	X ²	Df	P-value	Sig.
Age/Years	4.832	6	0.566	NS
Social status	1.359	3	0.715	NS
Educational Level	17.778	4	0.001	S
Experience years in the nursing field	3.306	5	0.653	NS
Experience years in the obstetrics and gynecology	5.049	5	0.410	NS
Training courses by the study sample				
Training courses related to Obstetrics and gynecology	.342	1	.559	NS
Training courses related to Vitamin D	3.169	1	.075	NS

X²: Chi-square, DF: Degree of freedom, p-value: Probability Value, p-value: Non Significant (more than 0.05), Significant: (less than 0.05), Sig: Significant, S: Significant, NS: Non-Significant.

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