Assessment of Knowledge and Attitude of Maternity Nurses Regarding Cord Blood Collection

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Abstract

Background: Cord blood has many benefits in terms of transplantation due to its cell content; moreover, it has some other advantages. **Aim:** Assess knowledge of maternity nurses regarding cord blood collection and assess the attitude of maternity nurses regarding cord blood collection. **Design:** A descriptive design utilized in completing this study. **Subject**: A convenient sample used composed of 250 nurses who worked at Ain Shams University Maternity Hospital. **Tools:** Interviewing questionnaire sheets to assess demographic characteristics of nurses, related nurse's awareness about cord blood collection and stem cells, and an attitude Likert scale was used to assess nurses' attitudes regarding cord blood collection and stem cells. **Results:** 63.2% of the studied nurses were had incorrect knowledge related to umbilical cord blood collection and 45.6% of the studied nurses have positive attitude with umbilical cord blood collection. **Conclusion**: there have been statistically significant differences between genders, age, qualification, and attending training courses related to stem cells. There are highly statistically significant relations between the attitude of studied nurses regarding umbilical cord blood collection and their age, their qualifications and years of experience, and there was a highly significant correlation between total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection. **Recommendation**: Enhance Educational course and continual training about the use of stem cells must be implemented to the nurses and Investigate the nursing concerns regarding their practice of cord blood collection sample technique.

Keywords: Knowledge, Attitude, Maternity nurse, Umbilical Cord, Cord Blood Collection, Stem Cells.

Introduction

Stem cells are repair units of the body that serve a central function in the maintenance and regeneration of organs and tissues throughout an organism's lifetime. Their main function is to replenish dying cells and regenerate damaged tissues. Based on the extensive stem cell research findings, many scientists have claimed that the cells could potentially generate cures and treatment for various diseases including cancers, cardiovascular disease, and igniting hopes of achieving stem cell-based replacement therapy in a medical setting *(Pandey.et al., 2016)*.

Recent developments in stem cell biology have explained the significant differentiation plasticity of many stem cell types in human tissue. Scientists are excited about the knowledge that could come from studying human stem cells. Most of them believe that these cells offer a precious opportunity to learn more about cytopathology, including how diseases develop and how they might be prevented or treated on the cellular level *(Allum et al., 2017)*.

Embryonic stem cells (ESCs) are undifferentiated cells that are not programmed to be specific to any mature cell types found in the human body.

Therefore, ESCs are fundamental in developing a diverse supply of tissues in the treatment of various diseases such as Parkinson's, Alzheimer's, spinal cord injuries, and cardiovascular disease (*Philip & Devi, 2017*).

Umbilical cord blood stem cells (UCBSCs) are very much preferred because of the high proliferative potential increased ability for self-renewal, decreased ability for antigen presentation, and most importantly, safety and ethical free characteristics. On the other hand, ASCs, which are found in almost all organs of the postnatal human body, provide an option of endogenous cell source for autologous transplantation, reducing the risk of graft rejection and allergenicity problems (*Lusardi & Mitchell, 2017*).

Stem cells from wire blood are a good deal simpler after come due to the fact it cells are effectively obtained from the cord yet the placenta at the day over delivery. Similar according to wire blood, connective adroitness from a share concerning the umbilical cord be able additionally remain collected, preserved, yet saved because of usage in clinical research, donated to a community twine blood bank, yet stored between a personal twine blood bank because after scientific need (*Katja, 2016*)

Nurses are the frontline people who will spend more time with the patients. In addition, nurses are patient's advocates in terms of medical knowledge. Information given from nurses to patients must be balanced and accurate, so that decision can be made considering the facts and unbiased answers (*Venugopal et al., 2016*). Therefore, nurses' knowledge of stem cells and their attitude towards stem cell applications in a medical setting are very important as these could affect the decision on providing appropriate stem cell-based treatments for many diseases including

cancer and cardiovascular diseases (*Patyal et al., 2018*).

Significance of the Study

In spite of many benefits of the stem cells obtained from umbilical cord blood, the umbilical cord was considered medical waste and disposed of following delivery along with the placenta due to the lack of knowledge about its the benefits and uses. In addition, from the researchers' clinical experience, they found that there was poor knowledge and negative attitude regarding cord blood collection among maternity nurses. Hence, it is imperative to raise nurses' knowledge about recent issues of cord blood collection

Aim of the study

The aim of the study is to assess knowledge of maternity nurses regarding cord blood collection and assess attitude of maternity nurses regarding cord blood collection.

Research questions:
1. Do maternity nurses have sufficient knowledge regarding cord blood collection?
2. Do maternity nurses have positive attitude regarding cord blood collection?

Subjects and Methods
I- Research design:

This study is a Descriptive design aimed to assess knowledge of maternity nurses regarding cord blood collection and assess attitude of maternity nurses regarding cord blood collection.

II-Technical design
A- Study setting
Setting:
The study was carried in: the Ain Shams University Maternity Hospital.

B- Sampling

Sample size: The convenient sample used, the sample was 250 nurses who work at Ain Shams University Maternity Hospital, according to the formula Sample size estimated to be sample size calculated using OpenEpi, Version 3, and open source calculator and based on a study carried out by *(Atiya, 2016)*.

C- Study tool:

First tool: was an interviewing questionnaire, it was developed by the researcher based on review of literature and content validated by the supervisor and expert opinion.it constructed to assess nurses regarding cord blood collection and assess attitude of maternity nurses regarding cord blood collection four parts (Appendix I).

Part one: was concerned with to assessment of socio-demographic characteristics of the study nurses include age, qualifications, years of experience and attending previous training.

Part Two: was concerned to assessment of nurses knowledge regarding the source of blood collection whether it from venous, arterial or from both vessels, advantages and the disadvantages of the use of cord blood.

Part three: was constructed to assessment of assess nurse's knowledge regarding the diseases that can be treated with umbilical cord blood transplantation such as malignancies, immunodeficiency disorders, bone marrow failure, haemoglobinopathies and the metabolic disorders.

Part four: was constructed to assessment of nurse's knowledge regarding the recommended procedures during cord banking and the precautions during the collection of blood. These knowledge such as the collection of blood in a special bags that containing anticoagulant agents, the importance of processing and freezing the collected blood immediately, the recommended temperature for storing and following the infection control precautions it also contained data related to the importance of blood banks accreditation and the cord blood standards.

❖ **Scoring system**

A-Scoring system: For each of the knowledge items, a correct response was scored 1, and the incorrect none and zero. For each area of knowledge, was considered satisfactory if the percent score was ≥60%, or more and non- unsatisfactory if less than <60%.

Second tool: An attitude Likert scale This tool was adopted from **Mohammed & EL Sayed, (2015)**: It was used to assess nurses' attitude regarding cord blood collection and stem cells and consisted of items including collecting umbilical cord blood immediately after delivery is necessary, cord blood available for life, umbilical cord blood should only be used for baby and his own family. It contains 11 items and is rated by three point Likert scale; disagree, uncertain, and agree.

A. Pilot study:

Will be conducted for 10% (25) from total nurses to evaluate the clearly of questions and content validity of the tools used according to pilot study results, and the modifications was done according to the available resources.

B. Field work:

The data was collected after obtaining the official approval for data collection within six months from October 2019 to April 2020. The researcher attended the previously mentioned setting three days per week from 9 a.m. to 2 p.m. At the beginning of the interview, the researcher introduced herself to nurses, explained to the nurses the aim of the

study and then the oral consent of the nurses was obtained.

Ethical consideration:

Informed written and oral consent was obtained from each adolescent after explaining the purpose of the study. Data was confidential and using coding system from data and each adolescent had the right to withdraw from the study at any time.

Administrative Design

Approval obtained through on issued letter from the Dean of Faculty of Nursing, Ain Shams University to directors of the previously mentioned settings. The researcher then met the schools directors and explained the purpose and the methods of the data collection.

Results

Table (1): shows that 41.2% of the studied nurses their age ranged between 20<30 years with mean 26.1 ±3.4. Almost half (51.6%) of the studied nurses were technical institute. Regarding years of experience, the above table illustrates that 56.4% of the studied nurses had years of experience between 5 <10 years, and the majority (93.2 %) of the studied nurses not attended training related to umbilical cord blood collection.

Figure (1): shows that almost two-thirds (63.2%) of the studied nurse were had incorrect knowledge related to umbilical cord blood collection, while 36.8%of them had correct knowledge related to umbilical cord blood collection.

Figure (2): displays that, 45.6% of the studied nurses were agreed with umbilical cord blood collection, while

33.6% of them disagreed with umbilical cord blood collection and 20.8% of them were uncertain with umbilical cord blood collection.
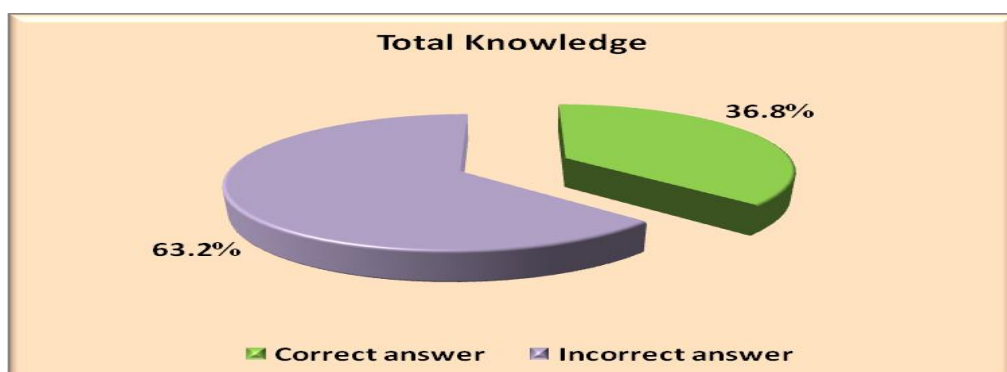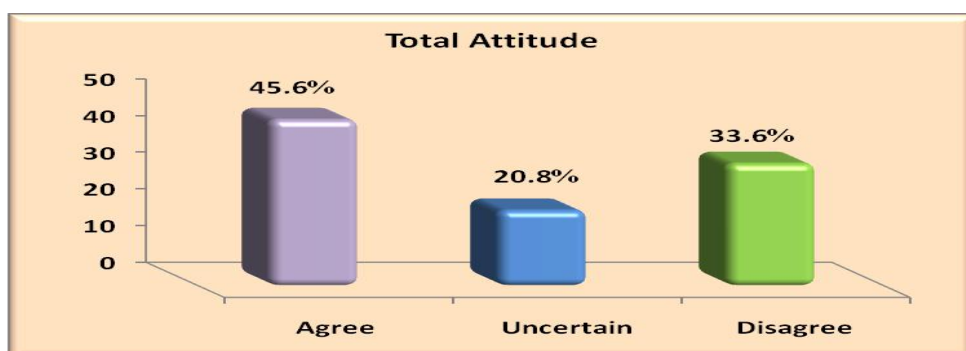
Table (2): illustrates that there were statistically significant relations between the knowledge of studied nurses regarding umbilical cord blood collection and their age (p-value < 0.05). Also, it shows that, were highly statistically significant relations between the knowledge of studied nurses regarding umbilical cord blood collection and their qualification and attending training courses related to stem cells (p-value < 0.0001respectively). Meanwhile, it shows that, was a statistically insignificant relationship between the knowledge of studied nurses regarding umbilical cord blood collection and their years of experience (p-value > 0.05).

Table (3): illustrates that there were highly statistically significant relations between the attitude of studied nurses regarding umbilical cord blood collection and their age, their qualification (p-value <0.0001& <0.005 respectively). Also, it shows that, were statistically significant relations between the attitude of studied nurses regarding umbilical cord blood collection and their years of experience (p-value <0.05). Meanwhile, it shows that, was a statistically insignificant relationship between the attitudes of studied nurses regarding umbilical cord blood collection and attending training courses related to stem cells (p-value > 0.05).

Table (4): demonstrates that there was a highly significant correlation between the total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection (p-value <0.01).

Table (1): Frequency distribution of study nurses according to their general characteristics (n=250).

Item	No	%
Age in years		
20<30	103	41.2
30<40	94	37.6
≥40	53	21.2
Mean ± SD	26.1 ±3.4	
Qualification		
Diploma nurse	71	28.4
Technical nursing institute	129	51.6
Nursing bachelor	50	20.0
Years of experience		
1 < 5	96	38.4
5<10	141	56.4
≥10	13	5.2
Mean ± SD	9.2±3.2	
Attend training courses related to stem cell		
Yes	17	6.8
No	233	93.2

Figure (1): Total knowledge score of studied nurses regarding umbilical cord blood collection (n=250).

Figure (2): Distribution of total attitude score of the studied nurses regarding umbilical cord blood collection (n=250).

Table (2): Relation between general characteristics of studied nurses and their total knowledge score regarding umbilical cord blood collection (n=250).

General characteristics	Total Knowledge				Significant test	
	Correct (n=92)		Incorrect (n=158)		X2	P
	No.	%	No.	%		
Age in years						
20<30	42	45.7	52	32.9		
30<40	33	35.9	50	31.6	8.55	**0.01***
≥40	17	18.4	56	35.5		
Qualification						
Diploma nurse	29	31.5	100	63.3		
Technical nursing institute	32	34.8	39	24.7	27.11	**0.0001****
Nursing bachelor	31	33.7	19	12.0		
Years of experience						
1 < 5	7	7.6	6	3.8		
5<10	31	33.7	65	41.1	2.59	0.27
≥10	54	58.7	87	55.1		
Attending training courses related to stem cell						
Yes	14	15.2	3	1.9	16.27	**0.0001****
No	78	84.8	155	98.1		

**Highly statistical significant at p-value<0.001   * Statistical significant at p-value<0.05

Table (3): Relation between general characteristics of studied nurses and their total attitude score regarding umbilical cord blood collection (n=250).

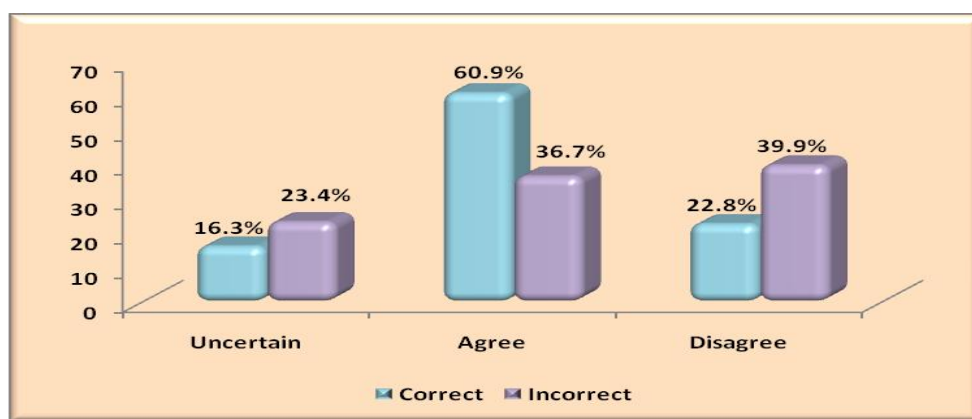| General characteristics	Total Attitude						Significant test	
	Disagree (n=84)		Uncertain (n=52)		Agree (n=114)		X2	P
	No.	%	No.	%	No.	%		
Age in years								
20<30	39	46.4	23	44.2	32	28.1		
30<40	34	40.5	19	36.6	30	26.3	28.0	**0.0001****
≥40	11	13.1	10	19.2	52	45.6		
Qualification								
Diploma nurse	34	40.5	22	42.3	73	64.0		
Technical nursing institute	30	35.7	20	38.5	21	18.5	14.7	**0.005****
Nursing bachelor	20	23.8	10	19.2	20	17.5		
Years of experience								
1 < 5	2	2.4	5	9.6	6	5.3		
5<10	31	36.9	27	51.9	38	33.3	10.3	**0.03***
≥10	51	60.7	20	38.5	70	61.4		
Attend training courses related to stem cell								
Yes	3	3.6	4	7.7	10	8.8	2.1	0.34
No	81	96.4	48	92.3	104	91.2		

**Highly statistical significant at p-value<0.001   * Statistical significant at p-value<0.05

Table (4): Correlation between total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection (n=250).

Total Attitude	Total Knowledge				Significant test	
	Correct (n=92)		Incorrect (n=158)		r	P
	No.	%	No.	%		
Disagree	21	22.8	63	39.9		
Uncertain	15	16.3	37	23.4	13.8	0.001**
Agree	56	60.9	58	36.7		

***Highly statistical significant at p-value<0.001   * Statistical significant at p-value<0.05*

Figure (3): Correlation between total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection (n=250).

Discussion

The umbilical cord is the vital direct interlink between mother and fetus, which is always depicted as the relationship of an emotional bonding of motherhood, which is a beautiful experience for a woman. The umbilical cord is referred to as cord blood; this particular blood contains numerous hematopoietic stem cells that can differentiate into other cells and the ability to self-degenerate **(Patyal et al., 2018)**.

Stem cells have tremendous promise to help us understand and treat a range of diseases, injuries and other health-related conditions. Their potential is evident in the use of blood stem cells to treat diseases of the blood, a therapy that has saved the lives of thousands of children with leukemia and can be seen in the use of stem cells for tissue grafts to treat diseases or injury to the bone, skin and surface of the eye. Important clinical trials involving stem cells are underway for many other conditions and researchers continue to explore new avenues using stem cells in medicine **(Edwin et al., 2016)**.

This study was carried out in order to assess the knowledge of maternity nurses regarding cord blood collection and assess the attitude of maternity nurses regarding cord blood collection.

Concerning the general characteristics of the studied nurses, the current the present study revealed that

almost half of the studied nurses their age ranged between 20<30 years with mean 26.1 ±3.4. Almost half of the studied nurses were technical institute. This result was in agreement with the result of **Manisha et al., (2018)**, who carried out a study to assess the awareness regarding umbilical cord stem cell therapy among health team members in tertiary care hospital, Karad reported that, all samples majority of were from 20-30 years of age. Regarding years of experience, more than half of the studied nurses had years of experience between 5 <10 years.

A similar study was in Egypt by **Mohammed et al., (2015)**, who carried out study knowledge and attitude of maternity nurses regarding cord blood collection and stem cells found that the majority of participants had 1-5 years of experience. This result was in agreement with the result of **Manisha et al., (2018)**, who found that the majority of the studied nurses had from 0-10 years of experience.

Concerning the training related to umbilical cord blood collection, the current study showed that the majority of the studied nurses did not attend training related to umbilical cord blood collection. This study was in the same line with **Manisha et al., (2018)**, who carried out a study of the knowledge regarding umbilical cord stem cell therapy among staff nurses with the view to developing self-instructional module found that most of the staff nurses had no previous information regarding stem cell therapy.

Regarding nurse's total knowledge related to umbilical cord blood collections, the findings of the present study revealed that almost two-thirds of the studied nurses were had incorrect knowledge related to umbilical cord blood collection. A similar result has been observed in another study done in **2018 by Patyal et al.,** to assess the knowledge and attitude of nurses regarding stem cell and umbilical cord blood banking

in selected hospital of Ambala concluded that, most of the nurses had average knowledge regarding stem cells and umbilical cord blood collection.

Regarding the nurse attitude toward umbilical cord blood collection, the findings of the present study revealed that almost half of the studied nurses were agreed with umbilical cord blood collection, while one-third of them disagreed with umbilical cord blood collection and the minority of them was uncertain with umbilical cord blood collection. This result was in agreement with the result of **Patyal et al., (2018)** revealed that the attitude of nurses regarding stem cells and umbilical cord blood banking was moderate.

Concerning the relation between general characteristics of studied nurses and their total knowledge score regarding umbilical cord blood collection the current study revealed that there, there were statistically significant relations between the knowledge of studied nurses regarding umbilical cord blood collection and their age. Moreover, were highly statistically significant relations between the knowledge of studied nurses regarding umbilical cord blood collection and their qualification and attending training courses related to stem cell? These findings are consistent with **Farouk et al., (2015)**, who study the nurses, knowledge about umbilical cord blood banking and its barriers reported that the relationship between knowledge and qualifications of the nurses followed by the age of them; meanwhile, educational level and age of nurses had a highly statistical significant independent effect on nurses' knowledge.

Concerning the relation between general characteristics of studied nurses and their total attitude score regarding umbilical cord blood collection, the current study revealed that there were highly statistically significant relations between the attitude of studied nurses regarding

umbilical cord blood collection and their age, qualification and their years of experience. This result was in agreement with the result of **Mohammed et al., (2015)** reported that there was a statistically significant correlation between PICU nurses' total awareness and attitude with their age whereas; there was no statistically significant correlation between hematology nurses' total awareness and attitude with their socio-demographic characteristics.

Concerning the correlation between total knowledge score of studied nurses & their total attitude regarding umbilical cord blood collection, the present study revealed that there was a highly significant correlation between total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection. This result was in agreement with the result of **Mohammed et al., (2015)** reported that, illustrate that there was no statistically significant correlation between nurses' knowledge, awareness, attitude. This study finding agreement with **Patyal et al., (2018)** revealed that the coefficient of correlation between knowledge and attitude score is a positive correlation between knowledge and attitude score of nurses regarding stem cells and umbilical cord banking.

Conclusion

Based on the study finding it Based on the study finding it concluded that, almost two-thirds of the studied nurses have incorrect knowledge related to umbilical cord blood collection. Moreover, of the studied nurses are agreed with umbilical cord blood collection. The current study revealed that, there are statistically significant relations between the knowledge of studied nurses regarding umbilical cord blood collection and their age, qualification and attending training courses related to stem cell. Meanwhile, there are statistical significant relations between the attitude of studied nurses regarding umbilical cord blood collection

and their age, their qualification and years of experience. Finally, there is a positive correlation between total knowledge score of studied nurses & their total attitude score regarding umbilical cord blood collection.

Recommendations:

The following recommendations were inferred from the study:

- Enhance educational course and continual training about the use of stem cells must be implemented the nurses.
- The undergraduate nursing curriculum must contain the recent technologies to update the knowledge and practice of nursing students regarding cord blood collection sample technique and stem cells.
- Investigate the nursing concerns regarding their practice of cord blood collection sample technique.
- Further research should focus on understanding the attitude and opinions of nurses and how their practices may be influenced by cord blood collection

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