



## Knowledge and Practice about Placental Stem Cell and its Utilization among Various Health Professionals in Selected Hospitals, Bangalore, Karnataka

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### Abstract

Medical and nursing science technology is advancing in a tremendous phase in the present world. The purpose of the study was to assess the knowledge and practice about placental stem cell and its utilization among various health professionals in selected hospitals, Bangalore. The objectives were to assess the knowledge and practice about placental stem cell and its utilization, determine the relation between the knowledge and practice score and find out the association. The study design was a descriptive survey research design. The sample consists of 300 respondents. The sampling technique adopted was non-probability purposive sampling technique. A structured questionnaire was used to collect the information. The validity and the reliability of the tool was done and checked by the test-retest reliability method using Karl Pearson correlation co efficiency. The tool for the reliability of knowledge was 0.91 and the reliability for practice was 0.90. The duration of the study was from 02-01-2018 to 30-03-2018. The present study showed the outcomes of Chi-square test analysis, among the demographic variables accounted for association, the variables age in years ( $\chi^2=10.795$ ,  $df=3$ ), gender ( $\chi^2=6.894$ ,  $df=1$ ), professional qualification ( $\chi^2=7.763$ ,  $df=3$ ), previous knowledge regarding placental stem cell collection ( $\chi^2=10.795$ ,  $df=3$ ), and source of information ( $\chi^2=10.795$ ,  $df=3$ ) were significantly associated with knowledge ( $p<0.05$ ). The demographic variable work experience only was not significantly associated at ( $p >0.05$ ). The outcomes of the Chi-square test analysis in this study, which was carried out to determine the association between practice about placental stem cell and its utilization among health professionals and the selected demographic variables. The variables age in years ( $\chi^2=17.850$ ,  $df=3$ ), professional qualification ( $\chi^2=15.252$ ,  $df=3$ ), previous knowledge regarding placental stem cell collection ( $\chi^2=3.870$ ,  $df=3$ ), and source of information ( $\chi^2=9.170$ ,  $df=3$ ) were found to be statistically significant associated with practice ( $p<0.05$ ). The demographic variable like gender and work experience were not statistically significant associated at ( $p>0.05$ ). So the result showed that the health professionals have inadequate knowledge on placental stem cell collection and its utilization. There is a necessity to improve the knowledge so as to improve skill in collecting placental stem cell. Thereby enhance the professional practice in performing placental stem cell collection. By doing this, will help patients in proper utilization of maternal health services.

**Keywords:** Knowledge; Practice; Placental Stem Cell; Utilization; Health Professionals

### Introduction

Stem cells are unspecialized and grow as specialized cells. The zygote can give rise to a whole organism, known as totipotent SCs. Stem cell which is type in inner cell mass where it can produce to many different type of cells and are consequently known as pluripotent, can do gene transfer thereafter. This also reduces the risk of immune rejection. PSCs can further specialized and give rise to cells with more specific functions, known as MSCs. These cells have the potential to become any cells in a specific organ i.e. multipotent.

Adult stem cells may have some plasticity and may have the potential to be used in other organs of the body. In the United Kingdom, cell cleavage up to 14 days after the fertilization can be used for research. This usually undertaken at 5-6 days, as research occurs on the cells at this stage the embryo does not exist as a 3-d entity and its properties are changed in essence it is to longer an embryo. Stem cell is found in the UC, which can be gathered, have originated in the fetal liver, most stem cell found in the cord are progenitor cells and differentiated further usually into hematopoietic stem

cells. These cells may cause transplant issues if used in other people unless there is a close genetic match, such as sibling. The cell could then be used to treat acute lymphoblastic leukemia. The human tissue authority, the Royal college of OBG have produced useful guidance papers to help inform midwifery practice around the tissue of stem cell harvesting and routine commercial UCB collection conducted in the United Kingdom. The recent advancement in stem cell therapy can advance the medical field through by means of applying latent as this has a power for new cell formation, creation and segregation to various lineages by one's own body. Stem cell are classified as SSCs and ESCs.

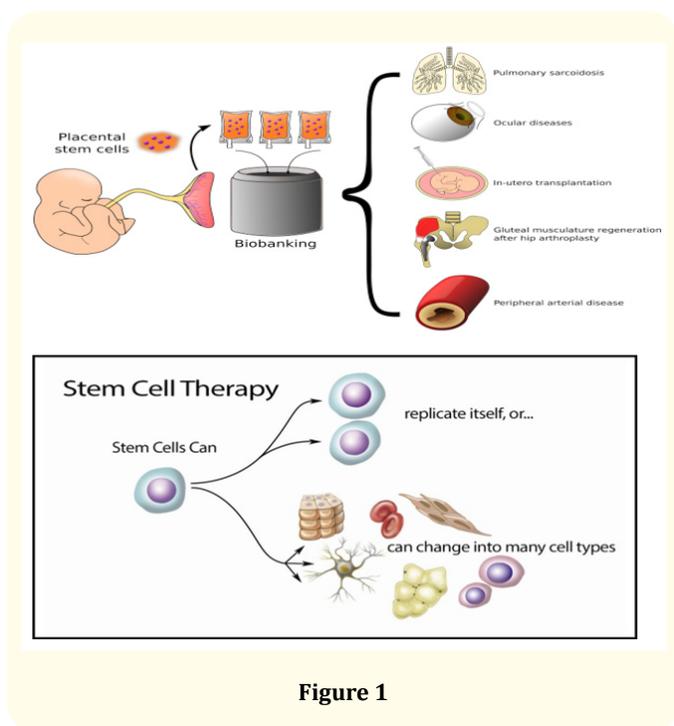


Figure 1

### Research objectives

1. To assess the knowledge about placental stem cell and its utilization among various health professional.
2. To assess the practice about placental stem cell and its utilization among various health professional.
3. To determine the relation between the knowledge and practice score regarding placental stem cell and its utilization.
4. To find the association between knowledge and practice and demographic variables.
5. To prepare a self-instructional module on effective methods in collecting the placental stem cell.

### Research hypotheses

- There will be significant correlation between knowledge and practice about placental stem cell and its utilization among health professionals.
- There will be association between knowledge and practice with demographic variables.

### Research methodology

The research design is quantitative, descriptive survey design. The sampling technique adopted was non-probability purposive sampling technique. The sample consists of 300 respondents. The setting selected was 4 hospital and population was staff nurses and lab assistants working in the selected hospitals. A structured questionnaire was used to collect the information. Tool 1: Structured questionnaire to identify selected extraneous variables like demographic variables. It included age, gender, qualification, work experience, previous knowledge, source of information of health professionals. Tool 2: structured questionnaire to assess knowledge about placental stem cell and its utilization among health professionals. The tool was a questionnaire with a question and four options where the respondents have to tick the most appropriate answer for the question. The correct answers were score a one mark and the wrong were score as zero. It consisted of anatomy and physiology of the placenta and umbilical cord, functions, characteristics, information about stem cell. The total items were 17. Scoring is correct tick will be 1 mark whereas wrong or no answer as 0. Tool 3: Structured questionnaire to assess practice about placental stem cell and its utilization among health professionals. The tool was a questionnaire with a question and four options where the respondent has to tick the most appropriate answer for the question. The correct answer was score a one mark and the wrong were score as zero. The items includes about the information of stem cell, its application, nurses responsibility. The total items was 25. Each item scored was one mark for the correct answer and zero for the incorrect answer. The data was analyzed by Frequency and percentage distribution will be applied to calculate the variables of health professionals. The Karl Pearson correlation was applied to determine the relation connecting the knowledge and practice about the placenta stem cell and its utilization among health professionals. Association between level of knowledge and practice about placental stem cell and its utilization and selected demographic variables was test by Chi-square. Unpaired t test/ANOVA F test was used for Comparing of mean scores of knowledge and practice on PSC and utilization of the health professionals over their demographic variables.

## Results

Section 1: Description of health professionals.

- The frequency and percentile

Section 2: Assessment knowledge and practice scores level about placental stem cell and its utilization among the health professionals.

- Percentile allocation of Health Professionals
- Frequency and percentage distribution of Health Professionals for practice regarding stem cell and its utilization.
- Mean, Standard deviation and Mean Percentage for level of knowledge and practice about placental stem cell and its utilization among health professionals.

Section 3: Relationship between knowledge and practice regarding stem cell and its utilization among health professionals.

- Correlation between knowledge and practice regarding stem cell and its utilization among health professionals.
- Linear regression analysis of practice on knowledge regarding stem cell and its utilization among health professionals.

Section 4: Association of knowledge and practice regarding placental stem cell and its utilization among health professionals with their selected demographic variables.

- Association between knowledge regarding stem cell and its utilization among health professionals with their selected demographic variables.
- Association between practice about placental stem cell and its utilization among health professionals with their selected demographic variables.

Section 5: Comparison of Mean and SD of knowledge and practice regarding stem cell and utilization among health professionals over their selected demographic variables.

- Mean and SD knowledge regarding stem cell and utilization among health professionals over their selected demographic variables.
- Mean and SD of practice about stem cell and utilization among health professionals with their selected demographic variables.

Section 1: Finding of demographic variables among health professionals.

- In the present study (57.7%) were 21-25 years, (17.7%) were 26-30 years, (17.3%) were 31-35 years and minimum (7.3%) were 36 years and above.
- In the present study, majority of respondents (83%) were females and minority (17%) were males.
- With respect to professional qualification, majority of respondents (53%) were GNM, 22% were PB. BSc Nursing, (14.3%) were B.Sc and 10.7% were lab assistant.
- In regards to work experience, 1-5 years (62%) working practice, 6-10 years (29%), (9%) were 11-15 years.
- Most of the respondents (71%) had no previous knowledge and minority (29%) had about placental stem cell and its utilization.
- With respect to source of information, majority of respondents, (47.1%) got knowledge from media, 24(27.6%) got knowledge from continuing nursing education, 17(19.5%) got knowledge from friends and 5(5.7%) from family.

Section 2: Assessment of level of knowledge and practice about placental stem cell and its utilization among various health professionals

- The present study found that, more than half, (58.7%) had inadequate knowledge about placental stem cell and its utilization, the rest (41.3%) had got a moderate level of knowledge and no one had adequate knowledge.

Section 3: Relationship between knowledge and practice regarding placental stem cell and utilization.

- The present study found a linear correlation regarding placental stem cell and its utilization between knowledge and practice,  $r=0.620$  among health professionals and  $S$  at ( $P < 0.001$ ). This implied an increase in knowledge bears the further increase in practice. The similar findings were revealed again. That is the skill of the health professional is directly depend on the knowledge what they gain during their experience. The value which was obtained through the R square also clearly shown as the practice can be improved only when the idea increased.

Section 4: Association of knowledge and practice regarding placental stem cell and its utilization among health professionals and variables.

- It showed outcomes of Chi-square test analysis, which was carried out to determine the association between knowledge regarding placental stem cell and utilization among health professionals and the selected demographic variables. Accounted for association, age in years ( $\chi^2 = 10.795$ , df 3), gender ( $\chi^2 = 6.894$ , df 1), professional qualification ( $\chi^2 = 7.763$ , df 3), previous knowledge regarding placental stem cell collection ( $\chi^2 = 10.795$ , df 3), and source of information ( $\chi^2 = 10.795$ , df 3) were significantly associated with knowledge ( $p < 0.05$ ). The demographic variable work experience only was not significantly associated ( $p > 0.05$ ). The association between practice about placental stem cell and utilization among health professionals and the selected variables. Accounted for association, age in years ( $\chi^2 = 17.850$ , df 3), professional education status ( $\chi^2 = 15.252$ , df 3), previous knowledge regarding placental stem cell collection ( $\chi^2 = 3.870$ , df 3), and source of information ( $\chi^2 = 9.170$ , df 3) were statistically significant connected with practice ( $p < 0.05$ ). The demographic variable of gender and work experience only was not significantly associated. The present study shown that the knowledge regarding placental stem cell and utilization among health professionals was significantly associated with age, gender, professional qualification, previous knowledge regarding placental stem cell collection at ( $p < 0.05$ ) source of information also. Similarly, the practice regarding placental stem cell and utilization among health professionals was significantly associated with age, professional qualification, and previous knowledge regarding placental stem cell collection and at 0.005 with the way the information are received. The H0 regarding knowledge and practice was rejected and H1 was accepted. So it is indicated that it was significantly associated with their demographic variables.

Section 5: Mean and SD of knowledge and practice regarding stem cell and utilization among health professionals over their selected demographic variables.

- The finding depicted the comparison of mean and SD of knowledge and practice over the demographic variables. Age in year was Fratio=18.454, gender ( $t = 1.066$ ), professional qualification (Fratio=11.324), work experience (Fratio=6.789), previous knowledge ( $t = 2.684$ ), source of information (Fratio=1.325). In this only gender and source of information was not found to be significant other were significant. In the aspect of practice scores, Age in year was

Fratio=8.254, gender ( $t = 0.968$ ), professional qualification (Fratio=14.048), work experience (Fratio=13.489), previous knowledge ( $t = 2.984$ ), source of information (Fratio=12.467). So, all the demographic variables were statistically significant except the gender.

Section 1: Description of demographic variables of health professionals

S. no	Demographic Variables	f	%
1.	Age ( years)		
	21 -25 years	173	57.7
	26-30 years	53	17.7
	31-35 years	52	17.3
	36 year and above	22	7.3
2	Gender		
	Male	51	17.0
	Female	249	83.0
3	Professional qualification		
	GNM	159	53.0
	Basic B.Sc (N)	43	14.3
	PB B.Sc (N)	66	22.0
	Lab assistant	32	10.7
4	Experience in working (in years)		
	1-5	186	62.0
	6- 10	87	29.0
	11- 15	27	9.0
5	Previous knowledge about placental stem cell collection		
	Yes	87	29.0
	No	213	71.0
6	If yes, source of information(n=87)		
	Family	5	5.7
	Friends	17	19.5
	Media	41	47.1
	Continuing nursing education	24	27.6

**Table 1:** Frequency distribution of health professionals with demographic variables.

The table indicated the distribution of respondents by age where, majority 173 (57.7%) were 21-25 years, 53(17.7%) were 26-30 years, 52(17.3%) were 31-35 years and minimum 22(7.3) were 36 years and above, for gender majority of respondents 249(83%) were females and minority 51(17%) were males, professional qualification, majority i.e. 159 (53%) were GNM, 66 (22%) were PB.BSc Nursing, 43(14.3%) were B. Sc Nursing and 32

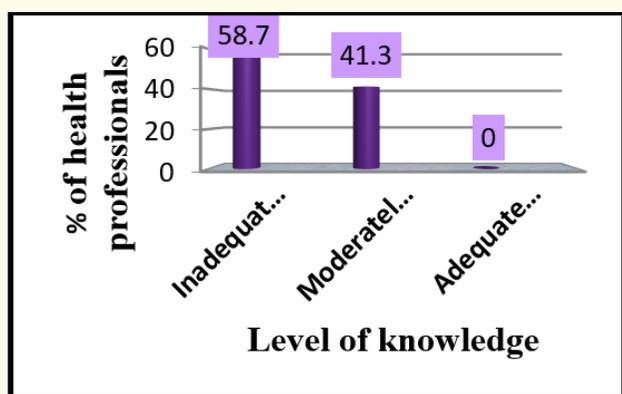
(10.7%) were lab assistant, work experience where, 186(62%) had 1-5 years of work experience, 87(29%) had 6-10 years and 27(9%) 11-15 years, previous knowledge about placental stem cell collection where, 213(71%) had no previous knowledge about placental stem cell collection and minority 87(29%) had previous knowledge, Source of knowledge where, 41 (47.1%) got knowledge from media, 24(27.6%) got knowledge from continuing nursing education, 17(19.5%) got knowledge from friends and 5(5.7%) from family.

Section 2: Assessment of level of knowledge and practice about placental stem cell and its utilization among the health professionals.

S. no	Level of knowledge	Health professionals	
		F	%
1	Inadequate (<50%)	176	58.7
2	Moderately adequate (50-75%)	124	41.3
3	Adequate (>75%)	-	-
4	Over all	300	100

**Table 2:** Health professionals with knowledge regarding placental stem cell and its utilization through Frequency and percentage distribution.

The above table revealed that more than half 176(58.7%) of them had inadequate knowledge about placental stem cell and its utilization, the rest 124(41.3%) were average and none were having the knowledge.

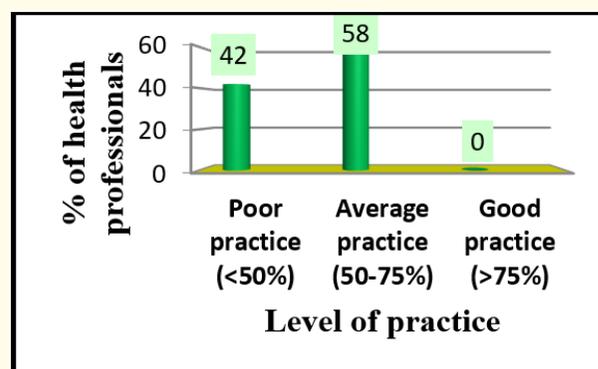


**Figure 2**

S. no	Practice level	Health professionals	
		f	%
1	Poor practice (<50%)	126	42.0
2	Average practice (50-75%)	174	58.0
3	Good practice (>75%)	-	-
4	Over all	300	100

**Table 3:** Distribution of health professionals with practice regarding stem cell and its utilization by frequency and percentage.

The above table depicted that, more than half 174(58.0%) of health professionals had average level of practice about placental stem cell and its utilization, the rest 126(42.0%) of them had poor practice and none of them had good practice.



**Figure 3**

Sl. no	Knowledge area	Max score	Mean	SD
1	Anatomy and physiology	10	4.60	1.22
2	General information on stem cells	7	3.02	1.01
3	Total	17	7.62	2.23

**Table 4:** Area wise mean and SD of the knowledge scores.

It shows the area wise comparison of mean and standard deviation of the knowledge scores of the area wise items, the mean scores in the area of anatomy and physiology was 4.60 with SD-1.22, general information on stem cells mean score was 3.02 with SD of 1.01. The total mean score was 7.62 and SD as 2.23.

Sl. no	Practice area	Max score	Mean	SD
1	General information on stem cells	7	3.01	1.01
2	collection, storing and transplanta-tion	15	8.07	2.43
3	Health professional responsibility	03	1.01	0.30
4	Total	25	12.09	3.74

**Table 5:** Area wise mean and SD of the practice scores

Reveal mean and SD of practices area wise scores, general information on stem cells has a mean value of 3.01,SD as 1.01,collection,storing and transplanta-tion has 8.07 as mean and 2.43 as SD, health professional responsibility area mean was 1.01,SD - 0.30. So the total mean value was 12.09 with SD as 3.74.

Sn	Variables	Max score	Test scores			
			Range	Mean	SD	Mean %
1	Knowledge	17	1-12	7.62	2.23	44.8%
2	Practice	25	2-18	12.09	3.74	48.4%

**Table 6:** Mean standard deviation and mean percentage of knowledge and practice scores about placental stem cell and its utilization among health professionals.

The table showed that for the over all aspects of knowledge and practice regarding placental stem cell and its utilization among health professionals. The knowledge about placental stem cell and its utilization scores were ranging within 1.12 out of the maximum score of 17 with mean 7.62 and standard deviation 2.23. The mean percentage was 44.8%.The practice scores were ranging within 2-18 out of the maximum score of 25 with mean 12.09 and SD of 3.74. The mean percentage was 48.4%. It evidenced that the health professionals were having a moderate knowledge and average practice regarding placental stem cell and its utilization.

Section 3: Relationship between knowledge and practice regarding stem cell and its utilization among health professionals.

Variables	Practice	
	R	p
Knowledge	.620*	P < 0.001

**Table 7:** Correlation between knowledge and practice regarding placental stem cell and its utilization among health professionals.

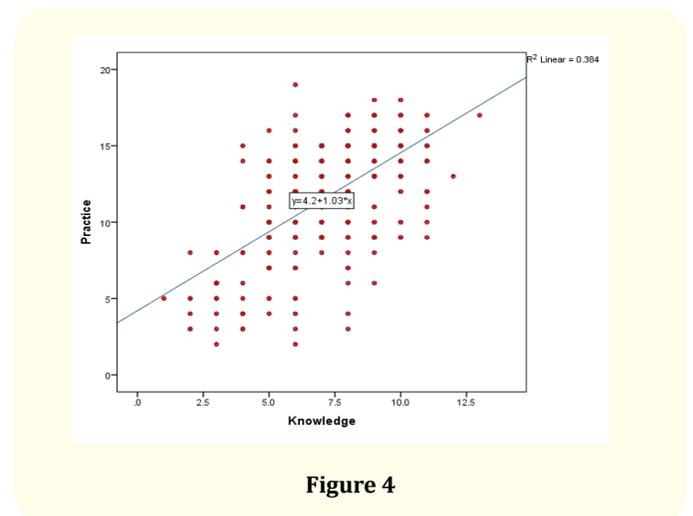
The table showed the knowledge and practice about placental stem cell and its utilization. It was found to be highly significant (P < 0.001). The regression analysis presented in table was also found to be significant. It may be concluded that there was relationship of knowledge and practice on placental stem cell and its utilization among health professionals. Hence, research hypothesis was accepted and null rejected.

Model	Un standardized coefficients		Standard-ized coefficients	t-value	P-value
	Beta	Std. error	Beta		
Knowledge (constant)	4.200	0.603		6.968*	p< 0.001
	1.035	0.076	0.620	13.643*	p< 0.001

Note: Dependent Variable: practice.  
Note: \*S at p <0.001.

**Table 8:** Regression analysis of practice for health professionals on knowledge.

The table presented the outcomes of relationship between knowledge and practice. The table evidenced a linear correlation between knowledge and practice regarding placental stem cell and its utilization was r=0.620 among health professionals and also at (p<0.001), significant highly. This implied an increase in knowledge bears the further increase in practice.



**Figure 4**

Section 4: Association of knowledge and practice regarding placental stem cell and its utilization among health professionals with their selected demographic variables.

S. n	Demographic variables	Sample (n=300)		Level of knowledge				χ <sup>2</sup> value	p-value
				Inadequate (n=176)		Moderate (n=124)			
		F	%	F	%	F	%		
1	Age in years							10.795, df=3, S	p<0.05
	21 -25 years	173	57.7	93	52.3	80	64.5		
	26-30 years	53	17.7	29	16.3	24	19.4		
	31-35 years	52	17.3	41	23.3	11	8.9		
	36 year and above	22	7.3	13	7.4	9	7.3		
2	Gender							6.894, df=1, S	p<0.05
	Male	51	20	22	12.5	28	22.6		
	Female	249	83	154	17.5	96	77.4		
3	Professional qualification							7.763, df=3, S	p<0.05
	GNM	159	53.0	85	48.3	74	89.7		
	B.Sc Nursing	43	14.3	33	18.8	10	8.1		
	PB.B.Sc Nursing	66	22.0	40	22.7	26	21.3		
	Lab assistant	32	10.7	18	10.2	14	11.3		
4	Work experience							0.972, df=1, NS	p>0.05
	1-5 years	186	62	106	60.2	80	64.5		
	6-10 years	87	29.0	52	29.5	35	28.2		
	11-15 years	27	9.0	18	10.2	9	7.3		
5	Previous knowledge about placental stem cell collection							6.739, df=1, S	p<0.05
	Yes	87	29.0	41	23.3	46	37.1		
	No	213	71.0	135	76.7	78	62.9		
6	If yes, source of information (n=87)							7.975, df=3, S	p<0.05
	Family	5	5.7	2	4.9	3	6.5		
	Friends	17	19.5	10	24.4	7	15.2		
	Media	41	47.1	23	56.1	18	39.1		
	Continuing education	24	27.6	6	14.6	18	39.1		

**Table 9:** Association between knowledge regarding placental stem cell and its utilization among health professionals with age in years.

It showed the outcomes of Chi-square test analysis, which was carried out to determine the association between knowledge regarding PSC and health professionals and demographic variables, age in years ( $\chi^2=10.795$ ,  $df=3$ ), gender ( $\chi^2=6.894$ ,  $df=1$ ), ( $\chi^2=7.763$ ,  $df=3$ ), work experience ( $\chi^2=0.972$ ,  $df=1$ ) was not significantly associated, previous knowledge regarding placental stem cell collection ( $\chi^2=6.739$ ,  $df=1$ ) its statistically significant associated with knowledge, source of information ( $\chi^2=7.975$ ,  $df=3$ ) was associated at ( $P < 0.05$ ).

It depicted the outcomes of Chi-square test analysis, which was carried out to determine the association between practice about placental stem cell and its utilization among health professionals and the selected demographic variables. The variables age in years ( $\chi^2=17.850$ ,  $df=3$ ), was significantly associated, gender ( $\chi^2=1.149$ ,  $df=1$ ), was found to be not significantly associated, professional qualification ( $\chi^2=15.252$ ,  $df=3$ ), was significantly associated, ( $\chi^2=0.797$ ,  $df=1$ ) was found to be NS associated, previous knowledge regarding placental stem cell collection ( $\chi^2=3.870$ ,  $df=3$ ) was significantly associated with practice ( $P < 0.05$ ).

S.N	Demographic variables	Sample (n=300)		Level of practice				χ <sup>2</sup> value	p-value
				Poor (n=126)		Average (n=174)			
		F	%	F	%	F	%		
1.	Age in years							17.850, df=3, S	p<0.05
	21 -25 years	173	57.7	63	50.9	110	63.2		
	26-30 years	53	17.7	22	17.3	31	17.835		
	31-35 years	52	17.3	35	27.8	17	9.8		
	36 year and above	22	7.3	6	4.3	16	9.2		
2	Gender							1.149, df-1, NS	p>0.05
	Male	51	20.0	19	15.1	31	17.8		
	Female	249	83.0	107	84.9	143	82.2		
3	Professional qualification							15.252, df=3, S	p<0.05
	GNM	159	53.0	53	42.1	106	60.8		
	B.Sc nursing	43	14.3	27	21.4	16	9.2		
	PB B.Sc nursing	66	22.0	34	27.0	32	18.4		
	Lab assistant	32	10.7	12	9.5	20	18.4		
4	Work experience							0.797, df=1, NS	p>0.05
	1-5 years	186	62.0	75	59.5	111	63.8		
	6-10 years	87	29.0	40	31.7	47	27.0		
	11-15 years	27	9.0	11	8.7	16	9.2		
5	Previous knowledge about placental stem cell collection							3.870, df=1, S	p<0.05
	Yes	87	29.0	29	23.0	58	33.3		
	No	213	71.0	97	77.0	116	66.7		
6	If yes, source of information(n=87)							9.170, df=3, S	p<0.05
	Family	5	5.7	0	0	5	8.6		
	Friends	17	19.5	10	34.5	7	12.1		
	Media	41	47.1	14	48.3	27	46.6		
	Continuing education	24	27.6	5	17.2	19	32.8		

**Table 10:** Association between practice regarding placental stem cell and its utilization among health professionals with age.

Section 5: Comparison of mean scores of knowledge and practice on placental stem cell and utilization over their demographic variables.

Table depicted the compared of two variables with the socio demographic, F test showed for the age was 18.454 and significant at the level of 0.001. For gender t value was 1.066 and found to be not significant, Professional qualification, ANOVA test depict as 11.324 and was significant, work experience, f value was 6.789 and Previous knowledge, t value was 2.684 and also S.

Source of knowledge, F value was 1.325 and not significant.

Table revealed about the practice score with the socio demographic variables. F test showed for the age was 8.254, which was significant at the level of 0.001. t - Value was 0.968 in gender and found to be not significant. NOVA test depict as 14.048 and was significant in regards to Professional qualification of the sample. In the work experience, f - value was 13.489. t - value was 2.984 and also S in aspect of previous knowledge. Source of knowledge, F value was 12.467 and significant

S.N	Demographic variables	Knowledge		Unpaired t-test/ F-test value (ANOVA)	p-value
		Mean	SD		
1.	Age (years)			$F_{ratio} = 18.454, S$	$p < 0.001$
	21 -25 years	8.14	1.74		
	26-30 years	7.83	2.24		
	31-35 years	5.73	2.68		
	36 year and above	7.45	2.30		
2.	Gender			$t = 1.066, NS$	$p > 0.05$
	Male	7.92	2.53		
	Female	7.55	2.17		
3.	Professional qualification			$F_{ratio} = 11.324, S$	$p < 0.001$
	GNM	8.22	1.72		
	B.SC(N)	6.26	2.72		
	PB.BSC (N)	7.03	2.58		
	Lab assistant	7.69	1.97		
4.	Work experience			$F_{ratio} = 6.789, S$	$p < 0.001$
	1-5 years	7.97	1.83		
	6-10 years	7.18	2.65		
	11-15 years	6.63	2.81		
5.	Previous knowledge about placental stem cell collection			$t = 2.684, S$	$p < 0.05$
	Yes	8.15	2.22		
	No	7.40	2.21		
6.	If yes, source of information(n=87)			$F_{ratio} = 1.325, NS$	$p > 0.05$
	Family	8.80	1.30		
	Friends	7.47	2.60		
	Media	8.08	2.25		
	Continuing nursing education	8.75	1.96		

**Table 11:** Mean and SD of knowledge regarding placental stem cell and utilization among the health professionals over their demographic variables.

### Discussion

It was found that, more than half, (58.7%) had inadequate knowledge about placental stem cell and its utilization, the rest (41.3%) had moderate knowledge and adequate knowledge was found none. The above finding was supported by many studies. Similarly, a study conducted by Hippokratia, (2014) showed that 15.6% of the participants had knowledge on the placental stem cell collection methods and the usage. Most of the respondents i.e (89%) that there is a need of a education training program to be arranged, 93.5% of the respondents say that they have not received any kind of training program from past 5 years or got little on the aspects of CB collection, and the procedures of the placental stem

cell. The present study found that, more than half (58.0%) of health professionals had average level of practice about placental stem cell and its utilization, the rest (42.0%) of them had poor practice and none of them had good practice. Similarly, a study conducted by Hatzistilli H (2014) on health professionals knowledge and attitude towards UCB donation in Greece. The findings showed that health professionals had only 15.6% information regarding CB collection techniques and its uses. It was found that there was linear relationship and it was found to be  $r = 0.620$  among health professionals and also  $S$  at ( $P < 0.001$ ). This implied an increase in knowledge bears the further increase in practice. The regression model was obtained as ( $Practice = 4.20 + 1.035 \times knowledge$ ) which indicated that there

S.No	Demographic variables	Practice		Unpaired t-test/ F-test value (ANOVA)	p-value
		Mean	SD		
1.	Age ( years)			F <sub>ratio</sub> =8.254, S	p<0.001
	21 -25 years	12.77	2.823		
	26-30 years	12.30	4.218		
	31-35 years	9.08	4.686		
	36 year and above	13.32	2.982		
2.	Gender			t=0.968, NS	p>0.05
	Male	12.26	3.702		
	Female	12.04	3.761		
3.	Professional qualification			F <sub>ratio</sub> =14.048, S	p<0.001
	GNM	13.07	2.691		
	B.SC (N)	9.81	4.558		
	PB.B.SC (N)	10.97	4.523		
	Lab assistant	12.56	3.491		
4.	Work experience			F <sub>ratio</sub> =13.489, S	p<0.001
	1-5 years	8.44	3.236		
	6-10 years	11.39	4.429		
	11-15 years	12.89	4.379		
5.	Previous knowledge about placental stem cell collection			t=2.984, S	p<0.05
	Yes	12.60	3.777		
	No	11.88	3.718		
6.	If yes, source of information(n=87)			F <sub>ratio</sub> =12.467, S	p<0.05
	Family	14.40	1.51		
	Friends	10.76	4.38		
	Media	12.83	3.50		
	Continuing nursing education	13.13	3.63		

**Table 12:** Mean and SD of practice regarding placental stem cell and utilization among the health professionals over their demographic variables.

is a relationship between the two variables. 38.4% changes in skill were obtained through the R-square value which was 0.384, indicated that the upgrading on expertise directly relates on the level of knowledge but some extraneous variables can also be factors.

Section 4: Association of knowledge and practice regarding placental stem cell and its utilization among health professionals.

It reported outcomes of Chi-square test analysis, which was carried out to determine the association between knowledge regarding placental stem cell and utilization among health professionals and selected demographic variables. Accounted for association, age in years ( $\chi^2=10.795$ , df 3), gender ( $\chi^2=6.894$ , df 1), professional qualification ( $\chi^2 =7.763$ , df 3), previous knowledge regarding pla-

cental stem cell collection ( $\chi^2 =10.795$ , df 3), and source of information ( $\chi^2 =10.795$ , df 3) were associated with knowledge (p <0.05) significantly. The demographic variable work experience only was not significantly associated (p >0.05). Similarly, Lye Jee Leng, *et al.* (2016) study on association between nurses knowledge and attitude on SC claim in medicine, tertiary teaching hospital. It was found statistically significant difference in total knowledge scores and nurses clinical working experiences (p=0.003). The majority of nurses showed a positive on SCs usage in medicine. Implementation of an in-service educational programme should be promoted to enhance the impact of knowledge and attitudes on stem cell application to fit contemporary health care needs [1-34].

## Conclusion

- The idea of having training before they perform the placental stem cell collection will be helpful to perform the procedure accurately as the knowledge were lacking among the health professionals
- There is a necessity of some protocol to be followed to have the procedure of placental stem cell collection
- Health professionals should improve in their practice while performing the placental stem cell collection.
- Lack of personnel in the hospitals leads to the inappropriateness in doing the procedure.

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