SUMMARY AND CONCLUSION
CHAPTER -6

6.1 SUMMARY AND CONCLUSION

The human female reproductive system have the following parts: (D.C Dutta, 2004)

- The upper part of the structure covers with hair is the Mons pubis.
- Below a layer covering the inner part with soft skin is labia majora. The ligaments ends at the margin of it.
- Underneath a thin skin folded form a layer called as minora with lots of glands, nerves and blood vessels.
- A very sensitive part of the vulva is the clitoris which is just 2.5 cm above the part with elevation.
- A layer of fourchette form by the 4 parts of opening i.e. urethral, vagina, hymen and ducts, and is called as vestibule.
- The blood supply for this areas are mainly by internal and external pudental artery and femoral.
- The nerve supply are the inguinal nerve and some part from genito femoral.
- The inside organs of the reproductive system are vagina which are the upper portion and more smaller at the entry.
- It has 2 walls as anterior and posterior.
- Other is the uterus. It is normally ante flexion and ante version. Length of 8cm, thick 1.25 cm, breath of 5cm and 50-80 gm in weight. 3 parts are consisted in uterus. They are body, isthmus and cervix.
- The upper part is fundus and connected by tubes at both the sides. The connecting route is the isthmus, 0.5 cm from the body to cervix.
- There are 2 parts in it, internal and external os. The outer connecting is the cervix, 2.5 cm more in cylindrical shape. Connected from isthmus and will be end as internal vagina. The normal uterine space long for 6.5-7 cm.
- The front of the uterus has the urinary bladder, back have the pouch of Douglas with coil of intestines and both the sides had ligaments. The 3 distinct parts forms the organs i.e. perimetrium, myometrium and endometrium.
- Both the side is connected with a tube called fallopian, approximately 10 cm in length supported by ligaments. The distal part has a finger like structure called fimbria to grasp the rupture ovum. It is divided into four parts. They are interstitial,
1.25cm, 1mm diameter, isthmus, 2.5 cm and 2.5 mm, ampulla, 5 cm and 6mm, infundibulum. 1.25 cm long and 6 mm.

- The main structure are serous, muscular and mucus membrane.
- Action of the tube is mature ovum to float, move it and helps to secrete a hormone and for living.
- Another organ is ovary, there are two pairs. One on the left and another on the right side of the uterus. It is of 3 cm long, 2 mm wide and 1cm thick.

Placenta is an organ responsible for the survival from embryo of the fetal. After conception of 3 weeks, the layers of trophoblast cells continue to invade the decidua through villi and it develops. From there, it grow into two layers i.e. outer syncytium and inner cytotrophoblast. Cotyledons of 15-20 is formed from anchoring septa as a third part. The function are endocrine gland with production of hormone mainly HCG. HPL is mother one which help for growth hormone like substance that stimulates maternal metabolism so that it can supplies nutrient for the fetal growth.

To summarize about the placental function, it take care the fetus growth and development. During the time when placenta form, it start to exist. The connecting stalk becomes compressed from both sides of the embryo forming narrow portion called cord. It is of 2 arteries which have blood from embryo to chorionic villi. One vein return the blood to the embryo. Normally it is 30-60 cm ling and 2 cm in diameter. The wartson jelly's covers the cord and prevent compression of vessels to ensure good nourishment of embryo fetus. The blood vessels are arranged out from the center to all the parts of placenta. (Bobak.I.M,1995)
The stem cell theory states that only certain relatively undifferentiated cells or stem cells of a particular tissue type are able to divide and reproduce the entire tissue. Examples include rapidly proliferating tissues such as bone marrow, the lining of the gastrointestinal tract, and the basal cell layer of the skin. In other words, most cells making up a particular tissue have matured or have become highly differentiated after cloned division from the reproducing cell or a specific stem cell. (Malhotra N, 2019, P-666)

The stem cell theory have explained about the growth of neoplastic cell. Many tumors are originated from a single SCs which is a result of a clonality of many tumors. So they consisted of minimum quality of SCs, as a reason of cells being not able to proceed through metastasis occurs. Based on the prediction of the theory, any therapeutic action can be planned on this cells population to avoid recurrences. Numerous stimuli may triggered the resting cells population into a new cell cycle. So there need a equilibilium on the part of meiosis and mitosis process to happen. The need for the control of the growth is important. The problem is large amount of cells are not able to re growth due to non responding period. There is a misunderstood on the part of the control in some case but otherwise others are unknown. (Malhotra N, 2019).
According to Malhotra N (2014) Some important Events are:

1960- Adult neurogenesis, brain SC process as presented Joseph Altman
1963- The presence of mouse bone marrow new cells, McCulloch & Till

After 5 years - Treat 2 children by transplant of bone marrow.

1978- Human cord blood found a haemopoietic stem cells
1981- Inner cell mass derived from mouse ES cells

In Ninety- Start SC from neurons culture

1995- Dickey amendment was signed by US president Bill Clinton objected some form of support on this study.
1997- SCs cancer was seen 1st time.

2 years later - James Thomson and co-workers identified the HSCs firstly.

2000s- Adult stem cells plasticity
2003- New source ASCs, children tooth.

In 1 year - Suk & Hwang W claims HESCs out of unfertilized ovum.
2005- SCs from CB was found out. It was proof that this cells will be better as compared with ASCs.

5 years after that - Federal funding for embryonic stem by passed by US president George W Bush

May 2006 - Senator Rick Santorum also enacted a bill on PSCs treatment.

July same year - Reformed the act as change in the presidency, George W.B.

August - Induction of pluripotent SCs, Kazutoshi T and Shinya Y try on rat Embryo.

November - US framed a new act to use the SCs.

January 2007- Research grant on Scs

June 2007- 3 different category in rat, the trial was done. So it can be used to human cells.

UCB which is received immediately from the child's cord as it born. This cell are rich in HSCs and are called as neonatal SCs. Considerable immature that the cells from bone marrow or the adult. UCB was also thrown with the placenta but now it is collected and stored the blood in the bank and other private companies for the transplantation. CB does not need a direct matched with the person who is going to receive because of the good quality of GVHD so its consider as the most advantage of all the stem cells. (Malhotra N, 2014).
According to Malhotra N (2014), some of the benefits are:

- Cord blood transplant gives better result in engraftment.
- Mismatches of tissue tolerant is high.
- It is easy to collect and can be utilised for many conditions.
- Less severe rate of GVHD
- It does not easily get any viruses
- It can be used for the child himself
- Speed up to check HLA match
- Large in term of donor pool
- It is readily available
- Lots of immune benefits with acceptance
- Most safe transplant than any other
- Its only one time cost
- Remission rate is less.

CONSTITUTION OF STEM CELL

Only disadvantage is as the limited number of cells, there can be a chance of graft fail if done in adult. Research on stem cells follow certain policy.
Internationally it is allowed in many countries same time it is not accepted in some part of the world. So there is a different rules in all the places and it followed very unique ways. Back to the Indian system of management, the government try to form a group of committee who are expertise in the field of medical and from the area of biotechnology somewhere in the year 2005. It was formed to regulate the function of work to be carried out in SCs and to frame a guidelines for the SC research and therapy. Now that is being followed throughout the country. (Malhotra N, 2014)
Marrow
  HLA larger constraint
  • GVHD treat problem
  • CMV more prone

Umbilical CB
  * potentially GVHD less problem
  * CMV less complicated
  * Rapid accessibility

UCB USEFULNESS (Malhotra N, 2014)
<table>
<thead>
<tr>
<th>Marrow</th>
<th>UCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>experience</td>
<td>* lack of experience</td>
</tr>
<tr>
<td>High rate of engraftment</td>
<td>* lower rate of engraftment</td>
</tr>
<tr>
<td>Donor recall possible</td>
<td>* remind for donor nor required</td>
</tr>
<tr>
<td>low hazard of gene problems</td>
<td>* Treat is high.</td>
</tr>
</tbody>
</table>

Disadvantages of using UCB  (Malhotra N, 2014)
Testing for Drug \(\leftrightarrow\) PSCs being cultivated \(\rightarrow\) Research on the growth and formation of genetic material expansion \& effect of lethal

\[\downarrow\]

Treatment for human

1. Cardiac
2. Neurons
3. Malignancy
4. Many ailments

**STEM CELL RESEARCH PROMISE. (Malhotra N, 2014)**

**BANKING PUBLIC AND PRIVATE**

<table>
<thead>
<tr>
<th>CB banking</th>
<th>Family CB</th>
<th>Public donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person's consent</td>
<td>It's patients right, he own it</td>
<td>No role</td>
</tr>
<tr>
<td>Financial cost</td>
<td>Approx 60,000 at the time of storing</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Place of collecting</td>
<td>Choice by the clients</td>
<td>Only at particular place</td>
</tr>
<tr>
<td>Ownership</td>
<td>Patients is the owner</td>
<td>It's open to the needed by the demand. Many times the collected SCs are usually for the usage of studies purpose or hardly available for the public domain.</td>
</tr>
<tr>
<td>Accessibility to use</td>
<td>Only match is required but can be easily use anytime while needed</td>
<td>Not generally applied. It take a long duration to find the SCs and ultimately not correct to transplant</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Any complication</td>
<td>Very less chance of GVHD as it is either going to use from self or from the own family members</td>
<td>Differ</td>
</tr>
<tr>
<td>Chance of using for the family</td>
<td>100%</td>
<td>Differ</td>
</tr>
<tr>
<td>Further application</td>
<td>Multiple</td>
<td>Not definite</td>
</tr>
</tbody>
</table>

The above principles bring out a person's right and it help from many unethical problem. Same time following the philosophy protect the individual from many situations.

**Some moral concepts:**

Many theories are made but specially the functional and deontology are considered the main highlight. It is one of the kind where the unavoidable situation is keeping in control. For every act, there is an equal consequences to be faced. Other concepts means about the responsibility. A person should draw a line of duty for his work. While in the job, what kind of person he has to be with the clients. It has an indirect impact on choice making. While the duty is carried out professionally, then the impact of verdict in any circumstances will be proper. Both the theories has a huge difference to follow. Task needs to be carried out with dedication. *(Diane MF, Margaret AC, 2003)*

An important aspects of the profession is taking a on paper approval before doing any procedures. In seventy, there was no term as such. But before any procedures, taking assent protect the person from all unwanted issues. By doing that it take care both the parties. The clients understood the whole procedures and its outcome and the nurse is also in safer side.
Many times it was difficult to follow, the reasons were:

- Less concern on the point of patient.
- Not able to follow the instructions
- After knowing the outcome, clients rejected to go for the treatment
- Not able to retain information
- less point in period

In the health care, one must make sure that whatever the procedures, the clients are well informed and they approved for that particular care. A kind of trust relationship will be built between the health care providers and the receivers in the medical set up delivery system. Other important concepts is caring. Considering the right of the patients and the midwifes, sometimes a best care will be able to provide. The client can rely on us only when the care providers considered the client's needs, decision and their beliefs. Next is the clients authority and support. They views the midwifes as a source of information while they come to hospitals. All the action carried out are scientifically proof and they knows that the things related to patients care. The doubts are clear with a solution for every crisis to the consumers. (Diane MF, Margaret AC, 2003).

5 core ethical issues found out by many studies are:

1. **Concerned**: Making a responsible to every individual while handling a patient care or advising to take up any action plan
2. **Approval**: One of the most important things in the hospitals while taking up any procedures for the clients.
3. **Maintaining confident**: Any individual accepted for the participation in any activity of work should not be disclosed to second persons. By this way, there will be a great regards for the profession while undertaking any actions.
4. **Standard**: One should follow strictly certain protocol while carried out the work. They are flamed by the government or by an individual which are expected to be maintained at any cost.
5. **Group**: Assembly of people control the action taken by a person. This people checked whether the particular things can be done to a human being. Both the parties are aware of the effects going in the studies. *(Diane MF, Margaret AC, 2003)*

**Recent problems in health care**: *(Diane MF, Margaret AC, 2003)*

Nothing can be hide in the health services this days. The consumer act was passed where the right of the patients are mentioned clearly. The health care needs to answer any issues arise by the clients. So as a midwives having a flame pattern of work may help to solve many problems to overcome it. One must be thorough of clients right, taking care of child and old age group where they are considered as vulnerable in the medical context. Midwives should always make the couples to be part of the decision making. The expectant should offer a chance of their choice for any activities which they needs to carry out. Nurses play a key role in providing accurate information and prepare the couples to go through the process of pregnancy.

**Design to update Syllabus for health professional**: *(Diane MF, Margaret AC, 2003)*

<table>
<thead>
<tr>
<th>Responsible agents</th>
<th>End product</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Council terms and condition</td>
<td>• Recent updates</td>
</tr>
<tr>
<td>• Expectation of women</td>
<td>• Revision of syllabus</td>
</tr>
<tr>
<td>• Ethical dilemma</td>
<td>• skill and practice need to be updated</td>
</tr>
<tr>
<td>• Advance technology</td>
<td></td>
</tr>
<tr>
<td>• Studies findings</td>
<td></td>
</tr>
<tr>
<td>• Leading to changes in clients care</td>
<td></td>
</tr>
<tr>
<td>• Maternity services</td>
<td></td>
</tr>
<tr>
<td>• Innovation in midwives the outlook of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Midwives</td>
</tr>
<tr>
<td></td>
<td>• practice as EBP</td>
</tr>
<tr>
<td></td>
<td>• Formulates protocol</td>
</tr>
<tr>
<td></td>
<td>• Encourage women for their involvement</td>
</tr>
<tr>
<td></td>
<td>• Skilfully practice the health care</td>
</tr>
<tr>
<td></td>
<td>• Bring down MMR &amp;IMR</td>
</tr>
</tbody>
</table>
Safe motherhood: (Diane MF, Margaret AC, 2003)

Started CSSM : Nineteen eighty seven
MMR report brought out : Nineteen eighty nine
Methods to screen the progress of labor and risk management: Nineteen eighty seven
Training and educating midwives in CSSM : Nineteen ninety
WHO baby friendly initiative : Nineteen ninety four
Brought out many modular on CSSM : Nineteen ninety six
Pregnancy to be safe for all mothers : Two thousand.

High risk control model: (Diane MF, Margaret AC, 2003)

Avoided for another Screening
new problems
Assessment of risk cases
start preventing
the complication
Evaluation of the end result
Follow up
Role for effective supervision: (Diane MF, Margaret AC, 2003)

- Statutory bodies clearance
- Authorize to practice
- EBP
- Record and report
- Understanding with groups
- follow principles
- maintain standards
- meeting the client's needs
- clear with ethical dilemma
- update skill
- training & education
- Team work
- obtain consent
- follow guidelines
- face challenges

Job description of the health professionals: (Diane MF, Margaret AC, 2003)

- Proper system of recording and reporting
- Able to carry out job as nurse manager and educator
- Clear with the problem of misconduct
- Updates the affiliation and accreditation process
- Proper guidelines followed while in services
- Able to handle clinical incidents
- Professionalism and follow a code of conducts
- In crisis situation able to support each others
- Encourage mothers for initiating the recent updates and other peer group also.
- Able to be a good analyst
- Should be a role mould
- Be a leader in the aspects of care
- Be an innovator
- Guidance to the couples
- Practice with EBP.
AIM:

1. To assess the knowledge about placental SC & its utilization with various health professional.
2. To assess the practice about placental stem cell and its utilization among various health professional.
3. To determine the relationship between the knowledge and practice score on placental stem cell and its utilization among various health professionals.
4. To find the knowledge and practice association regarding placental stem cell and its utilization among various health professionals and socio demographic.
5. To prepare a SIM on placental stem cell.

A survey of the related research and non-inquire about writing helped the specialist to detail an applied system and to embrace an appropriate procedure for the investigation. Writing assessed was identified with finish data on book picture of PSCs, UCB, the information among different gatherings about counteractive action of SCS, the studies on effectiveness of various educational programme on PSCs. The theoretical system embraced for the examination was situated in King's goal attainment show. The writing inspected additionally empowered the examiner to build up the devices for information gathering. It likewise helped her to choose an arrangement for information investigation and translation of information.

The study was carried out with an assumption that the educational programme are necessary for enhancing knowledge and practice among health professionals, they are an important measure to develop skill of doing this procedures.

A descriptive research approach was adopted for the study with quantitative design. The study was led in the five hospitals of Bangalore District, Karnataka state. Simple Random sampling was used to obtain an adequate size of the sample subjects. The samples comprised of total 300 staff nurses and lab assistants working in this hospitals.

To obtain the necessary data for the study, the tools were developed. A prearranged meeting timetable use to find out background information and knowledge regarding placental stem cells and its utilization.
The substance legitimacy of the information accumulation device was set up by 10 specialists. The unwavering quality for the organized meeting plan was computed by part half strategy and the estimation was finished with Pearson and Prophecy equation. Consequently, the instruments were observed to be solid.

A pilot study was led to check the practicality of the examination. The gathered information was composed, broke down and translated as far as targets and theories of the investigation. Both illustrative and inferential insights were utilized for the information investigation.

**MAIN FINDINGS ARE SUMMARIZED AS**
The results are organized as.

Section 1: Finding of health professionals demographic variables.
Section 2: Assessment knowledge and practice level about placental stem cell and its utilization among various health professionals
3: Relationship between knowledge and practice
4: Association of knowledge and practice regarding PSC among health professionals and demographic variables.
Section- 5: Comparison of mean scores of knowledge and practice regarding PSC and utilization over their demographic variables.

**Section 1: Demographic variables of health professionals.**
This selected variables of the study were age, gender, professional qualification, work experience, previous knowledge about placental stem cell collection, source of information.

**Major findings of the study:**
- With respect to age, majority 173 (57.7%) belonged to 21-25 years of age, 53(17.7%) were 26-30 years,52(17.3%) were 31-35 years and minimum 22(7.3) were 36 years and above.
- In regards to gender, majority of respondents 249(83%) were females and minority 51(17 %) were males.
- With respect to professional qualification, majority of respondents 159(53%) were GNM, 66(22%) were Post Basic B Sc nursing, 43(14.3%) were B.Sc and 32(10.7%)were lab assistant.
With respect to work experience, most of them 186(62%) had 1-5 years of working, 87(29%) had 6-10 years and 27(9%) had 11-15 years.

With respect to previous knowledge on placental stem cell and its utilisation, majority of respondents 213(71%) had no previous knowledge about placental stem cell and its utilization and minority 87(29%) had previous knowledge.

With respect to source of information, majority of respondents, 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 various health professionals

176 (58.7%) had inadequate knowledge and remaining 124(41.3%) had moderate and none had adequate knowledge, which is more than half of the respondents.

174 (58.0%) of health professionals had average level of practice about placental stem cell and its utilization and 126 (42.0%) of them had poor practice and none of them had good practice. The result is almost like maximum had no skill in performing the procedure of stem cell collection.

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

The obtained value was r=0.620 among health professionals and also found significant at (P< 0.001). The calculation was made through a statistical analysis called as linear regression. This has shown a good knowledge will have a better skill in every aspects.

Again to know the relationship between the knowledge and practice on placental stem cell and its utilization, the R- square was carried out. So the finding reported that there is a significantly regressed on knowledge and was shown by the regression. 38.4% increase in practice was by the influence of increase in knowledge, but remaining influence was due to other external factors.

Hypothesis testing-1

H₀₁: There is no significant relationship between knowledge and practice about placental stem cell and its utilization among health professionals.

Vs

H₁: There is significant relationship knowledge and practice about placental stem cell and its utilization among health professionals.
The relationship between the knowledge and practice about placental stem cell and its utilization was shown in the above table. It was found to be highly significant. The regression analysis presented in table 3.2 was also Significant. It clearly indicated that there exist a relationship between the variables.

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

It showed outcomes Chi-square test analysis, which was carried out to determine the association between knowledge regarding PSC and health professionals and 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 ($p>0.05$).

So it is indicated that the outcomes of Chi-square test analysis, which was carried out to determine the association between practice about PSC and health professionals and demographic variables. Accounted for association, 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 associated with practice. The demographic variable of gender and experience were not significantly associated.

From the table 4.1, some of the selected demographic variables like age, gender, professional qualification, previous knowledge and source of information at 0.05 level ($p<0.05$) shown a significant relationship with the knowledge.

Similarly, also some demographic variables such as age, professional qualification, previous knowledge regarding placental stem cell collection and source of information at 0.05 level also shown a significant correlation with the practice.

This implied a knowledge and practice regarding placental stem cell and its utilization among the health professionals was significantly associated with their demographic variables.

The researcher felt the need of some kind of training programme to be provided to the health personnel who are expose to the collection and the banking procedures. In this way, the knowledge will be enhance and that will improve the skill of the health workers. It is very important to build up the confidence of the public
toward the medical services. It was concluded through the above finding that the level of knowledge about the placental stem cell collection and its utilization is very poor.

Section- 5: Comparison of mean scores of knowledge and practice over their demographic variables.

ANOVA t test for comparing the mean and SD of the variables with their socio information. The only which is not significant is source of information remaining others like age , professional education, experience in work are significant. Through unpaired test, knowledge over gender was not significant others were i.e. previous information. Therefore, the analysis done for knowledge over variables concluded as all respondents as per difference in their background, it differs in their level of performance

For comparing mean scores of practice on the variables of the sample was also carried out by ANOVA. Most of the characteristics like age, professional qualification, work experience, source of information showed significant. Through unpaired t test, only gender not significant but information previously was significant. Hence, it proof the varied in their skill based on the exposure, prior working area and set up, so practice is completely differ about PSCs collection and utilization among health professionals.

Area wise comparison of mean and standard deviation of the knowledge value concerning the information on placental stem cell

1. Area wise knowledge value in the region of anatomy and physiology
   Mean score was 4.60 with SD 1.22

2. Area: knowledge on general information about stem cells
   Mean score was 3.02, 1.01 as SD

Practice area wise mean and SD value.

1. Area: practice on general information about PSCs
   Mean score - 3.01,SD-1.01
   The total mean value for the knowledge was 7.62 and SD as 2.23

2. Area: Collection, storing and transplantation
   Mean score -8.07,SD-2.43

3. Area: Practice on health professionals responsibility
Mean score - 1.01, SD-0.30
Practice area wise total mean was 12.09 and 3.74 was SD.

**Item wise response on knowledge scores.**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Items</th>
<th>No. of correct answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The meaning of placenta is</td>
<td>244</td>
<td>81.3</td>
</tr>
<tr>
<td>2.</td>
<td>The main function of placenta is</td>
<td>156</td>
<td>52.3</td>
</tr>
<tr>
<td>3.</td>
<td>Placenta is originated from the</td>
<td>52</td>
<td>17.3</td>
</tr>
<tr>
<td>4.</td>
<td>The normal weight of the placenta at term is</td>
<td>142</td>
<td>47</td>
</tr>
<tr>
<td>5.</td>
<td>The umbilical cord is the life line between the</td>
<td>66</td>
<td>22</td>
</tr>
<tr>
<td>6.</td>
<td>The length of umbilical cord is about</td>
<td>172</td>
<td>57</td>
</tr>
<tr>
<td>7.</td>
<td>The entire cord is cushioned by a soft substance called</td>
<td>255</td>
<td>85</td>
</tr>
<tr>
<td>8.</td>
<td>Wharton’s jelly helps the umbilical cord in</td>
<td>162</td>
<td>54</td>
</tr>
<tr>
<td>9.</td>
<td>Umbilical cord has</td>
<td>95</td>
<td>32</td>
</tr>
<tr>
<td>10.</td>
<td>The fetal arteries in the umbilical cord carries</td>
<td>47</td>
<td>16.3</td>
</tr>
<tr>
<td>11.</td>
<td>Stem cells are referred as</td>
<td>204</td>
<td>68</td>
</tr>
<tr>
<td>12.</td>
<td>SC is the main cells as</td>
<td>208</td>
<td>69.3</td>
</tr>
<tr>
<td>13.</td>
<td>SC can be specialized cells in various forms</td>
<td>69</td>
<td>23</td>
</tr>
<tr>
<td>14.</td>
<td>Stem cells are used to treat</td>
<td>113</td>
<td>38</td>
</tr>
<tr>
<td>15.</td>
<td>Stem cells are commonly found in</td>
<td>28</td>
<td>9.3</td>
</tr>
<tr>
<td>16.</td>
<td>Stem cells are primarily used in</td>
<td>216</td>
<td>72</td>
</tr>
<tr>
<td>17.</td>
<td>The stem cells which can differentiate to form only one kind of</td>
<td>65</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>differentiated cell types are</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Item wise response on practice scores.**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Items</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The blood vessel for collecting stem cell is</td>
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<td>22</td>
<td>The required amount of blood needed for transplantation surgery is</td>
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<td>23</td>
<td>Red blood cell depletion refers to</td>
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<td>24</td>
<td>The nurse should ensure that collection of maternal blood is for</td>
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<tr>
<td>25</td>
<td>The consent should be obtained from</td>
<td>158</td>
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**Structured Questionnaire on knowledge**

**Item no 1**
The no of answer of the respondent responded correctly saying placenta is organ for fetal survival is 244 (81.3%).

**Item no 2**
The total respondents who knew that respiration, nutrition, storage, excretion are the function of the placenta is 156 (52.3%).

**Item no 3**
The right answer for placenta origin is from embryo and the total answer was 52 (17.3%)

**Item no 4**
142 (42%) had responded rightly the normal weight of the placenta at birth which is one sixth of the baby weight.

**Item no 5**
There was 66 (12%) giving good response one UC as a lifeline of the child and the cord with placenta.

**Item no 6**
172 (57%) said that normal length of umbilical cord is about 50cm.

**Item no 7**
The respondents had answered about 255 (85%) that the soft substance which covers the entire cord is Wharton’s jelly.
Item no 8
166 (55%) responded the correct response of Wharton’s jelly which helps the umbilical cord in oxygenated blood

Item no 9
There was lots of confusion among the study group about the number of artery and vein in the cord. So only 95 (32%) said correctly that Umbilical cord has 1 artery and 2 veins
The book information is lacking in all the participants.

Item no 10
47 (16.3%) knows about the exact function of the artery and the vein. The question on fetal arteries which carries Oxygenated blood from placenta to fetus in the UC answered rightly by few of them.

Item no 11
The knowledge on stem cells was lacking among the participants. 204 (68%) have properly responded that this cells are referred as able to regenerate into other cells.

Item no 12
208 (69.3%) were able to answered about the SC and its benefits. SC has an ability to regenerate fresh cells and is the main building block of any body parts.

Item no 13
Only 69 (23%) could hardly know about the topic. The question on stem cells was rarely be able to understand to the group. That cell can differentiate into any type of specialized cells are totipotent cells.

Item no 14
113 (38%) can answered to the treatment part of this cells. Many do not know about the usefulness and they were not correctly responded that it can be used for malignant and non-malignant diseases.

Item no 15
Many of the participants were not able to answer correctly on where the stem cells are present. The answer responded were it is present is in umbilical cord and placental blood and was only 28 (9.3%) .
Item no 16
216 (72%) of the subjects can be able to answer the SCs in Transplant medicine

Item no 17
The respondents of 65 (22%) know about the SCs main function as it can differentiate to form only one kind of differentiated cell types are unipotent cells.

Structured Questionnaire on practice.

Item no.1
The respondent who properly responded were 58 (19%) that blood is collected from the vein for the SC storage.

Item no.2.
Among the 300 respondents only few knows that UCB is also known as placental blood i.e 133 (44%).

Item no.3
Only 105(35%) answered correctly the SCs should be fully developed and that is the reason it is unique compared to all the cells which are available.

Item no.4
227 (76%) of the respondents had given the right answer on that there needs a perfect match in bone marrow transplantation. The concern over the treatment is that both the party should be fully equal.

Item no.5
The meaning of allogenic transplant was not known by maximum of the group so only a 120(40%) not even the half population had known about graft versus host disease is actually.

Item no.6
132 (44%) had an idea about allogeneic transplant which is known as for patient receive cells from their own body.

Item no.7
The respondents had correctly answered about 232 (77%) that the advantage of placental stem cell. The main function are treat hematopoietic and genetic disorders
Item no.8
Among 300 respondents, only about 166 (55%) had given the correct answer on cryopreservation which is the only procedure done for the placental stem cell collection.

Item no.9
The participants had known about the banking of the PSCs where the collected SCs are being stored, processed and utilize for about 233(78%).

Item no.10
This question was a common one so got good response, answered exactly by 256(85.3%) i.e on 1st successful usage of SCs. It concluded that they are aware of the SCs application and this indicates a very clear information among public about SCs. Only the health personnel should pay more important to update the knowledge.

Item no.11
187(62%) reply to the charges collected by private placental stem cell banks are for Collection, processing and storage.

Item no.12
The number of correct answer on this item is 66(22%) were they knows about first public placental stem cell repository in Indi as Reliance life sciences.

Item no.13
It was hard for the group to answer on the longevity and duration about the SCs usage about 98(33%) had known about placental SCs may viable as much as more than 10 years after being store.

Item no.14
113 (38%) responded that life cell India is the first private organization who started doing the business of keeping the SCs banking.

Item no.15
Every year in the month of July. The whole world observed as the cord blood awareness. But rarely being follow in many place. The group were just guess ,it may be 195 (65%) had done appropriately.

Item no.16
214 (71%) of the group had an information on the individual’s right for access to placental stem cells after storing. The full rights are preserved in private bank.
Item no.17
The temperature for freezing the SCs is \(-196^\circ\) C. It is very important to follow strict steps in preserving it. So half of the group 198 (66%) had given that answer that the collected blood unit after slow cooling is frozen in this degree.

Item no.18
The main thing which is following is to make the cells to be alive until its being utilize for any reason. So the process of slow freezing is followed for that purpose and 210 (70%) had correctly answered.

Item no.19
From 300 sample, 14 (5%) heard about the agent used for keeping is liquid nitrogen and that is the only ways for storing.

Item no.20
As soon as delivery and cutting of the cord completed, within the timing of 10 minutes the procedures of placental stem cell collection should be done. If not accurate quantity and SCs can be properly taken. 210 (70%) responded that time and duration is of utmost thing to take care.

Item no.21
Dimethyl sulfoxide is the only agent used for the SCs storage. One of the cryopreservative used for protecting the cells for the damage. Only 8 (3%) of them given the answer rightly.

Item no.22
The total amount needed for any transplantation is 85ml of CB. The respondents had answered only 40 (13%) about this requirement of blood needed for any type of treatment regime.

Item no.23
From 300 of respondents, 178(58%) responded that red blood cell depletion process happens where the RBC which are in excess are being remove from the blood.

Item no.24
Many of our health care providers forget to collect some amount of maternal blood for storing with the cord blood. The necessity is to match the cord blood. So few 79 (26%) had responded that the nurse should make sure to collect maternal blood.
Item no.25
It is one of the main protocol for health personnel to not to take consent from both the parent for doing any procedures. Many respondents thought that only the mother can give the consent. So half of them had answered 158 (53%).

CONCLUSION

It can be concluded as brought out from the research that:

- 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.

6.2 RECOMMENDATIONS

The following points are being put forth by researchers and which will used for future study as accurately found from the results.

- Compare knowledge between staff nurses of government and private hospitals.
- An interventional study among staff nurses on placental stem cell can be conducted.
- Effectiveness of training program on placental stem cell.
- A comparative study among staff nurses and lab assistant regarding placental stem cell collection.
- A study can be conducted on the placental and cord blood banking procedure among health professionals.
- Evaluative study to assess performance of the procedures on placental stem cell collection among health professionals.
- Placental stem cell donation among expectant couples in a community setting.
- Effectiveness of training programme on placental stem cell collection may be tested with the Health Professionals.
A cohort may be conducted between knowledge before & after the training program.
On the basis of present findings it is recommended that a large sample should be studied in order to provide better picture on this aspects.
It can also be conducted at different hospitals setting.
The instrument used for assessing knowledge and practice towards stem cell, cord blood banking and its utilization can further be developed and field tested for standardizing.
The study can be conducted as in-service education to enhance staff nurses skill on stem cell, CBB and its utilization.
AN mothers knowledge on PSCs.

6.3 FUTURE SCOPE/IMPLICATIONS

The main aim was about placental stem cell and its utilization among health professionals. The results shown that there was inadequate knowledge and average practice regarding placental stem cell and its utilization among health professionals. And there is a need of training program to be provided for the health professionals to be skill in performing the procedure.

The findings can be used in the many areas where the nurses role are involved.
Nursing practice

Nurses are the very important personals of team of health, who participate a major part in promotion and maintenance of health. Nursing is a practicing profession; therefore the investigator generally integrates findings in to practice.
The findings implies the need for clinical health professionals to keep abreast with the knowledge by undergoing continuing education, in-service education and training to upgrade knowledge and be well versed with advancements in diagnosis and use of self monitoring instruments and managing skills.
The clinical health professionals can take part in an major role in educating the prospective parents about placental stem cell.
The study finding signifies the need of proper knowledge and practice in collecting the placental stem cell by health professionals.
➢ They should equip themselves with proper advanced knowledge based on education and evidence based practice in clinical areas.

➢ Nurses should provide accurate and clear information regarding importance of placental stem cell during the antenatal period.

➢ It is important to recognize that education and counselling should be provided early in the antenatal period so that the couples will be mentally prepared for the donation of the placental stem cell.

➢ Many ways of treatment that can be done through the placental stem cell can be informed to the couples.

➢ Health professionals should be familiar with the cord blood banking available nearby both in the private and public sector, the procedures of registration and their cost and benefits.

➢ Nurses can encourage antenatal mother to have a cord blood banking

➢ Health professional can organize more of training program to educate about the antenatal mothers and also to bring awareness about the placental stem cell donation

**Nursing education**

This study emphasis on the enhancement of facts and perform of nursing personnel concerning SCs in order to achieve more of expertise in performing and dealings.

➢ The study has proved that improving the understanding & practice PSCs will bring about better skill in collecting stem cell.

➢ Health professionals must be update their skill by the new technology, new approach and technique.

➢ Nursing curriculum should be updated and knowledge regarding placental stem cell should be incorporated at different levels using different methods of teaching to impart knowledge to the future nursing students.

➢ As a nurse educator, there are abundant opportunities for the health professionals to educate the other health care workers and the general public regarding placental stem cell.

➢ Good communication and interpersonal skills must be emphasized among health professionals to facilitate better understanding of the importance of placental stem cell among the couples.
Adequate training should be provided to the health professional regarding the effective methods of placental stem cell collection

In service education programme can be planned by the hospital management for the students and staffs regarding the importance of placental and cord blood banking

Students must be familiarize about the placental stem cell by inculcating in their curriculum

Placental stem cell and its concepts should be brought into the curriculum and students should be taught in depth information on such current topic.

Nursing administration

In the era of advanced technology, nursing administration demands for quality and competent care, improved awareness on dignity of life; brings challenge to nurse administrators to demonstrate their efficiency in providing best services to all nursing personnel.

The nurse administrator should take an initiative in creating health policy making and developing protocols related to awareness regarding placental stem cell.

Nurse administrators should review the institutional guidelines, policies and practices regarding placental stem cell collection.

Administration in both private and government sectors should take initiative action to update the knowledge of health personnel regarding placental stem cell by in-service education.

The nurse administrator need to plan, organize and conduct training program among health professionals to identify their level of knowledge and skill in performing the placental stem cell collection and thereby enhance the services to the society.

Nurse administrator should initiate a counselling department in the hospital and should assign a staff to conduct counselling among the couples in providing the information regarding the importance of placental stem cell and the facilitate the services available for this particular procedure.

Nurse administrator should use a multidisciplinary team approach in supporting the couples to help them aware about the placental stem cell collection.

Nurse administrator should monitor the health professionals while performing the procedures of placental stem cell collection so as to make the procedure is done effectively and will serve the purpose in a good way.
Nursing research

Nursing research is a vast area which is in the initial stage of development. The nursing profession is developing with scientific principle and hence there is high need of such research interventions that aid and enhance the body of nursing professional knowledge.

- There can have an emphasis on research as well as clinical studies which is needed to help the couples to be aware of the placental stem cell collection and banking.
- So it is importance to construct the sense of awareness in nursing. The findings gives a route for teaching faculty and nurses for carrying out many research in the upcoming years.
- Nurses got to interact in multidisciplinary studies in an endeavor to assist to boost the data and through creating use of it, issues visage by health professionals will be solved.
- Research facilitates to extend a organized dilemma fixing technique to enhance, expand techniques to sell appropriate maternal and toddler fitness.
- These studies capitulate productive result in upbringing many issues out of doing procedures and but can cope up while standards are maintained for all the nursing care.
- So process of doing nursing procedures through EBP is becoming more actual out of the research findings.
- Such kind of work make it possible to solve many issues and can come out with new ways of doing things.
- In depth studies of health professionals regarding placental stem cell can be conducted among medical personnel.
- They can be conducted with regard to bring awareness among prospective parents about this medical breakthrough.
- There is a great need for research in the areas of placental and cord blood stem cell among the health professionals.
- The present study would surely give a new researcher to have more and more evidence to undergo further.
- Out of this study, a better scientific and systematic approach can be made and extend the work on such area of finding.
- The result obtained can be used to establish other interventional programs.
6.4 LIMITATIONS OF RESEARCH WORK

- Generalization of the study is limited due to lack of random sampling.
- A structured items limited the quantity to find out.
- The study has been conducted in a selected hospitals setting and hence generalization of findings needs to be done with caution.
- The study is limited to only the lab assistant and staff nurses, hence the outcome of the knowledge and practice of collection of placental stem cell was not good.
- In this study, the self instructional module is given after the test so the investigator is not sure that the respondents will follow what is given in the module or will continue doing as per the policies of the hospitals.
- The knowledge and practice of the respondents are assessed only based on the items developed by the investigator and no previous experience or years of practice is considered in the outcome.
- The study is limited to only one group one time test so the knowledge can be affected by many aggravating factors which was not considered in the findings.