



RESEARCH ARTICLE

EVALUATION OF ORAL HEALTH CARE PROFESSIONALS KNOWLEDGE AND AWARENESS  
REGARDING SCOPE OF STEM CELLS

Siva Pillai A. S., \*Swetha R., Sunayana Manipal, Prabu D., Rajmohan M. and Naveenraj, N. S.

Department of Public Health Dentistry, SRM Dental College and Hospital, Ramapuram, Chennai

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ABSTRACT

Stem cell research is a new field in dental health aspect. Stem cells can be used in various replacement and regeneration procedures. In this regard minimum knowledge of stem cells, scope, applications and research is important. Aim of the present study is to assess the knowledge, awareness and scope of stem cells among Dental Professionals in Chennai city. A closed ended questionnaire consisting of a set of 34 questions regarding difference in application of stem cells in each field; effectiveness; professionals developing interest over stem cells, ethical issues, dentists advocating patients in donating stem cells, preservation of stem cells, attending vocational training courses on stem cells were included in the survey. The questionnaire was pre-tested prior to the survey. A total of 175 participants were participated in the study. 92% of individuals were interested in developing knowledge about stem cells. Only 25.3% of dentists attended vocational training courses regarding stem cells and 86.7% of them support and encourage many stem cell banks in India. 68% of dentist believe that extracting embryonic stem cells is ethical. 16% believe that it is unethical. 16% of participants don't know ethical issues regarding stem cells. 41.3% of participants don't know that stem cells can be used as a supportive therapy for hairloss in cancer patients and 49.3% of individuals don't know that it can be effective in burn victims and psoriasis patients. Study shows that dental professionals have positive attitude towards developing knowledge regarding stem cells. knowledge regarding sources of stem cells, applications of stem cells in therapeutic use need to be improved.

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INTRODUCTION

Stem cells are undifferentiated cells of a multinuclear origin which are capable of giving rise to indefinitely more cells by differentiation. Stem cells comes from variety of sources including blood, bone marrow, Umbilical cord blood and adipose tissue. Stem cells are classified as embryonic stem cells, foetal stem cells and adult stem cells. These are further divided into totipotent, pluripotent, multipotent, oligopotent and unipotent stem cells. Stem cell- based approach is useful for the repair and regeneration of defective tissues. Dental Stem Cells (DSCs) are the adult stem cells that are derived from the tooth structures. Over the past years, these DSCs have captured the attention of researchers, as these are readily accessible and can be obtained and stored for future use throughout the body. Stem cells from extra-oral sites may be used for regenerating dental tissue. Cells from tooth buds have

differentiated into a small tooth structure and transplanted in vivo (Duailibi et al., 2004). Stem cell research helps us understand more about development, aging and disease. These are used to treat or prevent a disease or condition. American academy of Pediatric dentists recognizes the emerging field of regenerative medicine and encourages dentists to follow future evidence based literature in order to educate parents about collection, storage, viability and use of dental stem cells (Pallvi Goomer 2014). Dentists, pediatrician, public health specialists are on the frontline of healthcare issues and inform patients to understand restoring of stem cells. In this scenario, knowledge regarding stem cells scope and applications are important. A study conducted by (Sede et al., 2013) among Nigerian Dentists revealed a high level of awareness, positive attitude and poor knowledge of the use of stem cells in Dentistry. Another survey conducted by (Utneja et al., 2013) concluded that endodontic residents were optimistic about the use of regenerative procedures, however, a need for more research and training was felt. Ethical issues have been determined as one of the obstacles for limiting research on Stem cells. Medical and dental researchers should have a possible

\*Corresponding author: Swetha R.

Department of Public Health Dentistry, SRM Dental College and Hospital, Ramapuram, Chennai

knowledge regarding ethical issues. A study conducted by (Gregory K Pike *et al* 2002) states that by law in several states embryos can only be maintained in deep freeze for 5, 10 or 15 years, after which time they must be thawed and hence allowed to die. If they are going to die anyway, why not use them for research? The study says that extracting embryos for research purpose is ethical rather than allowing it to die. Dentists facilitate in usage of stem cells in regenerative therapies. Hence, dentists must be knowledgeable about the biology, potential applications and banking services of dental stem cells. As there is limited literature, research needs to be conducted among dentists regarding knowledge about stem cells. Stem cell researches are exploring across the world, not many are still aware of its potential applications. This information is just confined only to the scientists who perform studies relating to stem cell therapy and other health professionals including dentists who are dealing with regenerative and endodontic procedures have only minimal knowledge regarding the approaches to stem cell therapies. This study aims at assessing dental professionals knowledge and awareness regarding scope of stem cells and results from the study will help to improve the education and training programs amongst dental professionals in the field of stem cells.

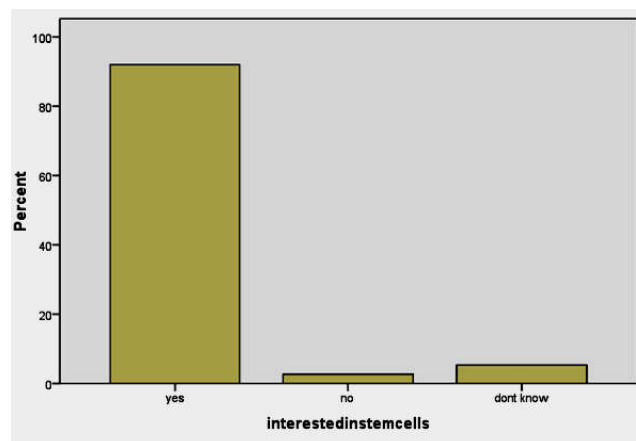
## MATERIALS AND METHODS

A Cross sectional study was conducted among the Dental Professionals of various recognized Dental institutions in Chennai urban Province. Study was conducted over a period of 2 months. Oral health professionals who were practicing general dentistry and dentists specialized in other branches were requested to participate in the survey. Stratified random sampling technique was employed. Chennai urban province was stratified into 4 zones. Dental professionals willing to participate were selected randomly from the list of corresponding institutions for sampling purpose to generalize results. A close ended questionnaire consisting of a set of 34 questions in total regarding application of stem cells in each field; effectiveness; cost of stem cell therapy; ethical issues, interest in developing knowledge about stem cells, difference between autologous and heterologous stemcells were included in the survey. The questionnaire was listed in English language. Professionals who are willing to participate and gave their consent are included in the study. Participants who are not willing to participate were excluded. The questions were given with options – ‘yes’, ‘no’, ‘don’t know’; ‘yes’ gives a coding of 1, ‘no’ gives a coding of 2 and don’t know option codes 3. The questionnaire was pre- tested in 20 individuals prior to the survey to check for feasibility. Questions were altered and reframed following the pretest. A total of 175 participants were selected for the study. These set of questions were distributed among different dental professionals. After the questions were filled, they were collected from dentists and unfilled questionnaire > 75% were excluded from the study. All the questions were described in detail to the participants before start of the study. A prior permission was obtained from the head of the institution before the start of the study. The set of questions were also enclosed (Appendix-I). The values were compiled in the excel sheet and descriptive

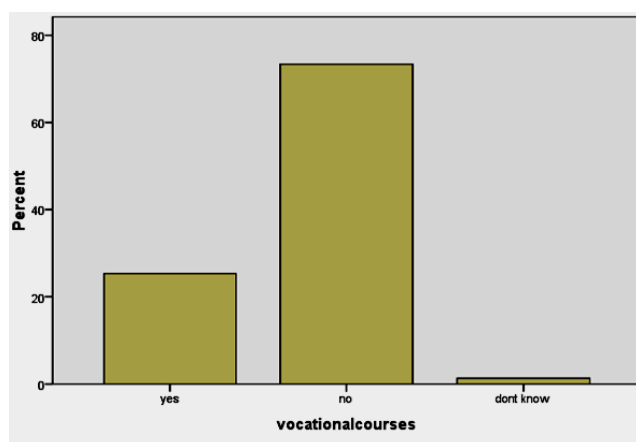
statistics of qualitative data analysis was performed. Statistical version of SPSS software 20 was used.

## RESULTS

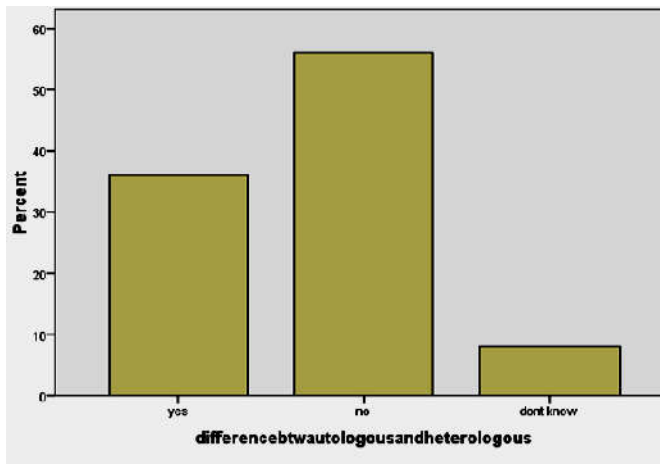
92% of dental professionals were interested in developing knowledge about stem cells (Graph-I). Very few, 25.3% of oral health professionals had attended vocational training courses regarding stem cells and 73.3% of individuals didn’t attend vocational training courses (Graph-II). Only 36% of individuals have known difference between autologous and heterologous stemcells (Graph-III). Ethical issues involved in stem cell research shows that 68% of participants believed that extracting stem cells is ethical. 16% believed that it is unethical and other 16% of participants don’t know about ethical considerations of stem cells (Graph-IV). 80% of individuals advocate their patients to donate stem cells (Graph-V). Higher percentage of individuals i.e 86.7% support and encourage stem cell banks in India (Graph-VI). 41.3% of individuals don’t know that stem cells were used to relieve from side effects such as hairloss in the treating cancer patients. 49.3% of individuals don’t have idea regarding use of stem cells effectiveness in treating burns and psoriasis patients. Only 56% of individuals know that stem cells can be used along with other therapies. 32% of the participants don’t know that stem cell therapy can be used along with other therapies.



Graph-I: Would you be interested in developing knowledge about stem cells

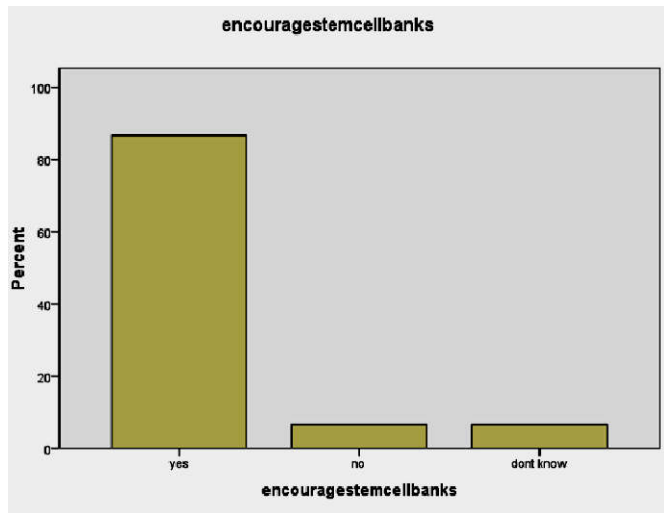


Graph-II: Did you ever attended vocational training courses regarding stemc ell



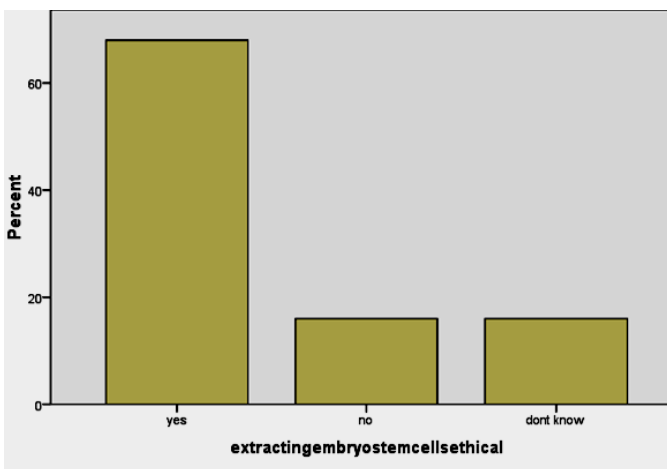
Graph-III: Do you know the difference between autologous and heterologous stem cells

medical field is at a vast range. Stem cell usage in the field of dentistry has its potential in regenerative procedures.

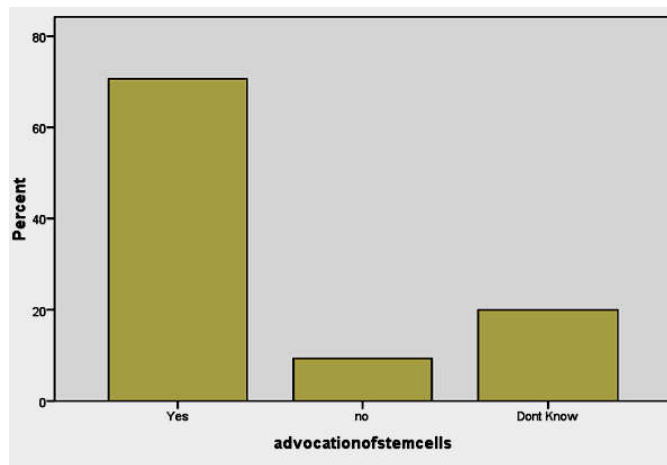


Graph-VI: Do you support or encourage stem cell banks in India

Many invasive treatment procedures can be patently dealt with stem cells. In this regard, dental professionals need to be expertise about the knowledge, applications and scope of stem cell research. Present study was conducted among dental professionals practicing in and around Chennai city. Among these, 92% of dental professionals have shown interest in developing knowledge about stem cells. This percentage is greater than in the study conducted by (Utneja *et al.*, 2003) that 73% of participants expressed enthusiasm to gain knowledge about stem cells. This shows that dental practitioners have positive attitude and enthusiasm to gain knowledge regarding stem cells. In this study, dentists have very less knowledge regarding biological and structural aspects of stem cells. This is clear by assessing the percentage of individuals when asked difference between autologous and heterologous stem cells, only 36% of individuals know the difference. Ethical issues involved in stem cell research need to be emphasized. In this 68% of participants believed that extracting embryonic stem cells is ethical, 16% of participants believe that it is unethical and other 16% of participants don't know. In future, dental professionals entry into stem cell research need to fulfill ethical aspects so, thorough knowledge regarding ethical aspects should be emphasized. In the present study, 86.7% of dental professionals support and encourage stem cell banks in India. These findings are similar to the study conducted by (Mamatha *et al.*, 2015) that 65.1% of dentists support and encourage stem cell banks. Encouraging stem cell banks shows that dentists are very much aware of importance of stem cell preservation in near future. In this study, 41.3% of participants don't know that stem cells can be used as supportive therapy for hairloss in cancer patients. 49.3% of individuals don't know that stem cells can be used as effective therapy in burn victims and psoriasis patients. This states that oral health professionals knowledge towards application aspect of stem cells is poor. Study conducted by (Mathew Asizide, Sede *et al.*, 2013) states that leading source of information regarding stem cells for dental professionals were obtained from vocational training courses which is 43.8%. In this study, only 25.3% of dentists attended vocational and training courses regarding stem cells.



Graph-IV: Do you believe that extracting embryo stem cells is ethical



Graph-V: Would you advocate your patients to donate stem cells

**DISCUSSION**

Stem cell research is upcoming field and new approaches in the applications have been established. Practice of stem cells in



- 21) Stem cell therapy is available for which of these conditions?  
a) Osteoarthritis b) Cancer c) All of these
- 22) How long would it take to see the improvement of stem cell therapy?  
a) Few months b) A year c) More than a year
- 23) Will the patient be asked to return regularly for follow ups?  
a) Yes b) No c) Don't know
- 24) Can this type of treatment cause cancer?  
a) Yes b) No c) Don't know
- 25) Could a stem cell therapy be repeated?  
a) Yes b) No c) Don't know
- 26) Could this therapy be used at the same time with other therapies?  
a) Yes b) No c) Don't know
- 27) Is this stem cell therapy for hair loss effective?  
a) Yes b) No c) Don't know
- 28) Can cancer patients be treated for hair loss with this therapy?  
a) Yes b) No c) Don't know
- 29) Will there be any scarring from this treatment?  
a) Yes b) No c) Don't know
- 30) Is hair transplant or regeneration is most effective?  
a) Transplant b) Regeneration c) Don't know
- 31) Is stem cell therapy effective in burn victims or psoriasis patients?  
a) Yes b) No c) Don't know
- 32) What type of cancer are treated with BMT and PBSCT?  
a) Leukemia b) Lymphomas c) Both
- 33) Is there any everlasting side effects of this therapy?  
a) Yes b) No c) Don't know
- 34) In which of these cases do you think stem therapy will be least effective or with least chances of patient survival?  
a) Leukemia b) Lymphoma c) Neuroblastoma

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