

Impact of an Educational Program on Patients' Awareness and Attitudes Regarding Importance of Stem Cell in Their Treatment "Program for patients about Importance of Stem Cell"

Elhagga Ibr. Eldesouky

Medical Surgical Nursing Department, Faculty of Nursing, Port Said University, Republic Arabia Egypt.

Corresponding Author: Dr. Elhagga Ibr. Eldesouky, Association with Port Said University, Faculty of Nursing, Medical Surgical Nursing,. E-mail: EEAldesoqi2019@gmail.com Active contact number: 00966550367551 LiveDNA: 20.25295

Abstract: Stem cells have an incredible role in medicine especially for treatment of chronic diseases because their characteristics have the ability for regeneration and repairing of the damaged tissues. Some current therapies, like bone marrow transplantation, already create use of stem cells and their potential for regeneration of broken tissues. **Objective:** To evaluate the impact of an educational program On Patient s' Awareness and attitudes regarding importance of stem cell in their treatment. **Material and methods:** 220 patients admitted all general hospitals of Port Said City, Egypt. The data were collected using structured Questionnaire sheet, which was consisted of 35questions related to socio-demographic data and patient s' awareness and attitudes regarding importance of stem cell in their treatment among hospitalized patients. **Results:** All hospitalized patients admitted in different mentioned departments hadn't any awareness about importance of stem cell in treatment of their chronic diseases in pretest .there were statistically significant improvement immediately after program implementation .Moreover; the results revealed statistically significant correlation between awareness of patients and their attitudes in their importance of stem cells in their treatment. **Conclusion:** Therefore, it can be concluded from the results of the current study that educational program for patients had a incredible outstanding positive impact on their awareness and attitudes regarding importance of stem cells in their treatment. **Recommendation:** Improving patients knowledge and their attitudes by encouraging patients to attend health education about new trends about their treatments.

Keywords: Educational program, Patient s' Awareness, Attitudes and Stem Cell.

I. INTRODUCTION

The Stem cells are the body cells (somatic cells) which might divide and become differentiated. When an associate degree human grows, stem cells specialize, and take specific functions. as an example, mature tissues like skin, muscle, blood, bone, liver, nerves, all have different kinds of cells. Because of stem cells don't seem to be nevertheless differentiated, they will modification to become some quite specialized cells. Additionally use stem cells to exchange broken cells and therapy of stem cell is the use of stem cell to treat or prevent a disease or condition [1].

The two broad forms of class stem cells are embryonic stem cells, and adult stem cells, that are found in adult tissues. In a developing embryo, stem cells will differentiate into all of the specialized embryonic tissues. In adult, stem cells act as a repair system for the body, replenishing specialized cells, however additionally maintain the traditional turnover of blood, skin, and viscous tissues. [2,3].

Stem cells can be grown in tissue culture. In culture, they'll be reworked into specialized cells, like those of muscles or nerves. Highly plastic adult stem cells are taken from a range of sources, together with funiculus blood and bone marrow. They are currently employed in medical therapies, and researchers expect that stem cells are going to be employed in several future therapies.[4]

A team of scientists from the University of Wisconsin–Madison considered the first group to isolate human embryonic stem cells and keep them alive in the laboratory. The team knew that they had in fact, isolated stem cells as a result of the cells may remain unspecialized for long periods of time, yet maintained the ability to transform into a variety of specialized cell types, including nerve, gut, muscle, bone, and cartilage cells.[5,6]

Stem cell analysis is being pursued within the hope of achieving major medical breakthroughs. Scientists are an attempt to create therapies that rebuild or replace damaged cells with tissues fully grown from stem cells and provide hope to people suffering from cancer, diabetes, cardiovascular disease, spinal cord injuries, and many other disorders.[5,3]

Over the past twenty years, scientists are bitten by bit deciphering the processes by that general stem cells become the numerous specialized cell sorts within the body. Stem cells will regenerate themselves or turn out specialized cell sorts. This property makes stem cells appealing for scientists seeking to make medical treatments that replace lost or damaged cells .[7,8,9,10,11]

Based on all previous studies showed the importance of stem cells successful in the treatment of chronic diseases. So, this research is done to evaluate the impact of an educational program on patient s' awareness and attitudes regarding the importance of stem cell in their treatment.

Significance of the Study: Patients with chronic diseases were needed to be aware regarding the stem cells importance in medical care and its outstanding roles of stem cells in the treatment of chronic disease especially cancer, diabetes, neurological disorders, renal and cardiovascular disorders. Their increased awareness increased their positive attitudes regarding importance of stem cells in their treatment. According to Statistical Report adult stem cells generate new cardiac tissue, The new concept of 'cancer stem cells' has directed scientific communities towards a different wide recent area of research field and possible potential future treatment modalities for the cancer and chronic disease.

Aim of the study:

The aim of this study was to evaluate the impact of an educational program On Patient s' Awareness and attitudes regarding the importance of stem cell in their treatment.

Research questions:

1. What is patient s' awareness regarding the importance of stem cell in their treatment?
2. What is patient s' attitudes regarding the importance of stem cell in their treatment?
3. What is the level of improvements of patient s' awareness and attitudes regarding the importance of stem cell in their treatment after program?
- 4- Is there statistical significant correlation between patient s' awareness and attitudes regarding the importance of stem cell in their treatment after program?

II. MATERIALS AND METHODS

Research Design:-

The design of this study is quasi –experimental design done to evaluate the impact of an educational program on patient s' awareness and attitudes regarding the importance of stem cell in their treatment

Setting:-

The study was conducted at the General and Alnasr, Alzhor hospitals , and Port Fouad Hospital, at Port Said City, Egypt.

Subjects:-

The population of this study consisted of 220 patients with chronic diseases e.g diabetes , cardiac disease, renal diseases, neurological diseases, and cancer admitted in all different internal departments in four hospitals at Port Said city.

Tools for data collection:-

One tool was used in the study “structured questionnaire sheet”. The questionnaire was used to evaluate impact of an educational program on patient s’ awareness and attitudes regarding importance of stem cell in their treatment. The questionnaire was designed to contain three parts;

Part I ; It included items related to socio-demographic characteristics of the studied patients as age , sex, educational level , occupational level , chronic diseases.

Part II ; It included questions related to patients’ awareness about importance of the stem cell in their treatments .

Part III; It included ten questions related to patients’ attitudes about importance of the stem cell in their treatments (religion, ethical , culture, community, education of medical care provider).

This study was conducted in four phases ;

pretest phase which aimed to evaluate awareness and attitudes of patients regarding importance of the stem cells therapy in their treatment . The researcher interviewed patients on individual bases to fill the questionnaire for about 20 minutes.

Program planning phase ; the training program was developed based on the identified needs and demands of patients gathered in pretest phase , and in the light of the most recent pertinent literature.

Program implementation phase ; the patients were divided in four groups in each hospital . the training program lasted for 16 weeks, four sessions for each group ; each session took about 30 minutes .the researcher developed program booklet which was distributed to all participants . the different teaching methods were used .

Posttest phase; the program outcome was evaluated immediately after finishing program.

The duration of research project was from June 5, 2017 to December 1, 2018. The patients answered a questionnaire containing 20 items related to awareness of patients and 10 questions related to attitudes on a three points Likert scale with (2) right answer, (1) incorrect answer and (0) not sure .

scoring system , the knowledge’ scores were presented as good, moderate and poor as per the score got by the participant i.e. 4-9, 10-14, and 15-20 respectively.. The ten items related to attitudes with two points scale; agree (2), and disagree (1). The level of good awareness of patients regarding importance of stem cells in their treatment were calculated by 60% and more to correct answers of the questionnaire .

The ethical consideration;

Permission to conduct the study was obtained from the responsible authorities after explanation its purpose. The tools were tested for their content validity and clarity by 9 experts in nursing field and doctors specialized in the management of patients with **chronic diseases** and appropriate modification was done accordingly. Data was obtained from each patient prior to their inclusion in the study after explaining its purpose and importance. Confidentiality of the information was assured by the researcher.

The pilot study ;

It was carried out after the development of the tool. It was carried out on ten patients admitted in different departments from each hospitals to test the reliability and applicability of the tools of the study. The necessary modification were done based on the results of the pilot study. Those patients were excluded from the subject of research work to assure the stability of answers and attitudes.

Statistics

After data were collected, they were coded and transformed into specially designed format so as to be suitable for computer feeding. All entered data were verified for any errors. The statistical package for social sciences (SPSS) was utilized for statistical analysis and tabulation. Data were presented using the following statistical measures were used:

Descriptive statistics included: frequency and percentage for qualitative variables, and ranges, means and standard deviations. Quantitative continuous data were compared using student t- test. Pearson correlation analysis was used for assessment of interrelationships among quantitative variables. Statistical significance was considered at P-value < 0.05.

$$t = \frac{(\sum D)/N}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{(N-1)(N)}}$$

III. RESULTS

Table (1) shows sociodemographic data of studied patients. About two third of the patients (60.46%) were female. (45.45 %) of the studied sample's age was ranged between 65 and more years. As regards to their educational level, one third of the studied sample (32.27%) was Secondary school degree. As regard to occupations more than two third (70.46%) of the studied patients were no working. Concerning chronic diseases, (45.45%) of the studied sample had renal failure.

Table (2) shows differences of their patients' awareness regarding importance of stem cell in their treatment throughout the educational program intervention, The results indicated improvements of patients' awareness in all variables regarding posttest than pretest. These improvements were statistically significant where (t=13.05) at P- value < 0.05.

Table (3) shows relationship between pretest and posttest in patients' awareness regarding importance of stem cell in their treatment throughout the educational program intervention. The results indicated statistical significant improvements of patients' awareness after the program intervention in posttest where (t=-11.47) at P- value < 0.05. it Demonstrate all studied patients (100%) got poor awareness regarding stem cell therapy in the preprogram test where Mean± SD (1.90±0.85). While the majority of studied patients (95%) got good awareness regarding importance of stem cell in their treatment and 5% of studied patients got moderate awareness in addition to no poor awareness was reported in posttest where Mean± SD (2.80±0.41). Their levels were higher than the preprogram in pretest.

Table 4 shows relationship between pretest and posttest in patients' attitude response regarding importance of stem cell in their treatment throughout the educational program intervention in relation to their correct responses. 88% studied patients had neutral response and 12% of them had negative response in pretest where Mean± SD (2.40±0.46). While the majority of studied patients (90%) had positive response, 10% of them had neutral response, and no any one (0.0%) had negative response regarding importance of stem cell in their treatment where Mean± SD (2.82±0.35). Their responses in posttest were higher than the preprogram in pretest. The results indicated statistical significant improvements of patients' attitudes after the program intervention in posttest where (t=5.39) at P- value < 0.05.

Table 5: shows Correlation between awareness and attitude of patients regarding importance of stem cells therapy in their treatment. it demonstrated statistically significant positive correlation between patient's awareness and attitudes before program application, where (r=.435) and statistically significant positive correlation between patient's awareness and attitudes after program application, where (r.490).

TABLE (1): SOCIOEMOGRAPHIC DATA OF STUDIED PATIENTS.

Items		N n= (220)	
		Count	Percentage %
Sex	Male	87	39.54%
	Female	133	60.46%
Age	35-<45	25	11.36%
	45-<55	34	15.45%
	55-<65	61	27.72%
	65+	100	45.45%
Educational Level	Non Educated	53	24.09%
	Primary	44	20%
	Intermediate	22	10%
	Secondary(diploma)	71	32.27%
	Bachelor Degree	30	13.63%
Occupational Status	Working	65	29.54%
	Not Working	155	70.46%
Chronic diseases	Heart diseases	39	17.72%
	Diabetes mellitus	58	26.36%
	cancer	13	5.09%
	neurodegenerative diseases	10	4.54%
	Renal failure	100	45.45%

TABLE (2): DIFFERENCES IN PATIENTS' AWARENESS REGARDING THE IMPORTANCE OF STEM CELLS THERAPY IN THEIR TREATMENT THROUGHOUT THE PROGRAM INTERVENTION.

variables	N n= (220) pretest						N- n= (220)-posttest						t	p-value
	agree		disagree		Not sure		agree		disagree		Not sure			
	N	%	N	%	N	%	N	%	N	%	N	%		
The Stem cells have the ability to build every tissue in the human body .	0	0	0	0	220	100	212	96.36	8	3.64	0	0	13.05	.000*
Characteristics of stem cells are unlimited self-renewal and ability to differentiate.	0	0	1	0.45	219	99.55	208	94.54	12	5.46	0	0		
The Stem-cell can used in treatment or prevention of most chronic diseases .	2	0.9	8	3.63	210	95.46	206	93.63	14	6.37	0	0		
Bone marrow transplantation is the most widely used stem-cell therapy.	0	0	0	0	220	100	203	92.27	17	7.73	0	0		
Adult stem cells, or "tissue stem cells," can come from different parts of the adult body.	0	0	0	0	220	100	201	91.36	19	8.64	0	0		
adult stem cells are limited to only becoming more of their specialized tissue.	0	0	4	1.81	216	98.19	198	90	22	10	0	0		
The adult cardiac stem cells can be transplanted to treat renal disease.	1	0.45	9	4.09	210	95.46	1	0.45	219	99.55	0	0		
The embryonic stem cells replicate themselves in an undifferentiated state for very long periods of time before stimulating them to create specialized cells.	0	0	0	0	220	100	195	88.63	25	11.37	0	0		
The embryonic stem cells can be used to treat any chronic diseases.	0	0	6	2.72	214	97.28	195	88.63	25	11.37	0	0		

The umbilical cord blood can be used to obtain stem cells from it .	0	0	80	36.36	140	63.64	193	87.73	27	12.27	0	0
The bone marrow is source of stem cells.	1	0.45	0	0	219	99.55	177	80.45	43	19.55	0	0
The brain stem cells (adult stem cells) make only brain cells.	4	1.81	1	0.45	215	97.73	199	90.45	21	9.55	0	0
The stem cells can be used to treat heart diseases.	0	0	0	0	220	100	200	90.9	20	9.1	0	0
The stem cells can be used to treat diabetes mellitus especially type one .	0	0	0	0	220	100	191	86.81	29	13.19	0	0
The stem cells can be used to treat cancer.	0	0	21	9.55	199	90.46	210	95.45	10	4.55	0	0
The stem cells can be used to treat Parkinson's disease, schizophrenia, Alzheimer's disease, spinal cord injuries , stroke .	0	0	0	0	220	100	185	84.09	35	15.91	0	0
The compatibility ratio between donors and stem cells receivers should be high.	0	0	28	12.72	192	87.28	191	86.81	29	13.19	0	0
The stem cells can be stored for many years in specific refrigerator	0	0	11	5	209	95	210	95.45	10	4.55	0	0
Any one can donate the stem cells .	0	0	0	0	220	100	197	89.54	23	10.46	0	0
There are the conditions to donate the stem cells.	0	0	0	0	220	100	210	95.45	10	4.55	0	0

TABLE (3): RELATIONSHIP BETWEEN PRETEST AND POSTTEST IN PATIENTS AWARENESS REGARDING IMPORTANCE OF STEM CELL IN THEIR TREATMENT THROUGHOUT THE EDUCATIONAL PROGRAM INTERVENTION (CORRECT ANSWERS).

	Pre		Post		t	p
	Number (n= 220)	%	Number (n=220)	%		
Poor (4-9)	220	100	0	0.0	-11.47	.000*
Moderate (10-14)	0	0.0	11	5		
Good (15-20)	0	0.0	209	95		
Mean	1.90		2.80			
SD	.85		.41			

TABLE 4: RELATIONSHIP BETWEEN PRETEST AND POSTTEST IN PATIENTS' ATTITUDE RESPONSE REGARDING IMPORTANCE OF STEM CELL IN THEIR TREATMENT THROUGHOUT THE EDUCATIONAL PROGRAM INTERVENTION (CORRECT RESPONSES).

Items	Pre	Post	t	p
Positive	0%	90%	5.39	.000
Neutral	88%	10%		
Negative	12%	0%		
Mean	2.40	2.82		
SD	.46	.35		

TABLE (5): CORRELATION BETWEEN AWARENESS AND ATTITUDE OF PATIENTS REGARDING IMPORTANCE OF STEM CELLS THERAPY IN THEIR TREATMENT.

Items	Awareness x Attitudes	
	r	P value
Pretest	.435	0.015*
posttest	.490	0.008*

IV. DISCUSSION

The stem cells, notwithstanding their cell sources, have self-renewal capable and provides rise to multiple specialized cell sorts, even to an entire adult cell.[12] This has allowed fast progress in the biology of stem cell. The creation of adult-induced pluripotent stem cells (iPSCs) permits autologous applications for illness treatments to become one among the foremost exciting areas in stem cell therapy.[13] the judgment of the approaches that may have provided promising choices for regenerative medicine, particularly for the treatment of the neurologic disorders. [14].

The results of the present study revealed that about two third of studied patients were female. Most of them were in the age group from 65 years and more than 65 years. the majority of them were not working and the most of them had renal failure. These results were agreed with another result of studies in which the aging of the population and the chronic disease's association with advanced age "multimorbidity," is predicted to become the most problem in elderly populations.(15) Previous studies reported that prevalence rates of multimorbidity ranging from 40% to 80%; the women had multimorbidity rates higher than among men.(16,17) Few studies have evaluated the chronic condition distribution and multimorbidity by socioeconomic status (SES). Recently, physical health deteriorated earlier with age among persons from the bottom activity grade. (18,19,20,21,22)

The results of the present study revealed that the improvements in posttest after program levels were significantly higher than the pretest before program levels. These results might be due to that impact of educational program improved their knowledge about stem cell therapy. These results were congruent with the previous studies in which Their results showed good information after the program .(23,24) In addition to there were many studies that conveyed poor knowledge about stem cells medical care before an educational program, and there was a statistically significant improvement in knowledge in the posttest after the intervention.(25) Similar results, where the structure of the teaching program was succeeded effectively in enhancing the patients' knowledge regarding stem cell medical care [26,27].

Although patients in the preprogram, study reported poor information regarding stem cells therapy, their attitudes were influenced where there was no one got positive attitudes regarding stem cell therapy. But after program within posttest; the majority of them showed a positive attitude regarding stem cells medical care. Although there is a debate about stem cells donation and transplantation among religion, participants are willing to accept new medical innovation that may produce a cure for diseases or provide promises to the human being. This belief would have an effect on participants' positive view of stem cells therapy. This result was in accordance with a study that stated the ten questions to evaluate the attitude level in their study, majority of the participants showed an outstanding attitude .the various educational programs on stem cell should be implemented considering the cultural, religious, social, and behavioral determinants in the population to improve stem cell knowledge and encourage a more positive attitude towards stem cells in medicine. [23,24,27,28]

regarding the application of stem cell in a medical setting. There were similar findings to the current study however with a totally different population. They concluded that all of the pregnant women in their study had positive attitudes toward stem cells donation. On the otherwise, results from the present study were not congruence with the author who reported two-thirds of the studied subjects had a negative attitude toward stem cell therapy before the intervention, immediately and after three months of intervention. This percentage changed to more than two-thirds of the studied subjects who reported a positive attitude toward stem cell therapy and stem cells. On the contrary, participants' attitudes in their study revealed the least significant improvement and found many difficulties in changing attitudes. [23,24,27,28]

The present study found a significant association between awareness in the pre and in the posttest and there was an association between awareness and attitude in the pre and in the posttest. the sample in this study got poor awareness and attitudes in the pretest . while there was an improvement in awareness and increased positive attitudes regarding stem cell therapy (90%) in posttest after a program. There was contradiction the present study where other studies reported weak correlation between knowledge and attitude. [27]

V. CONCLUSION

There was a statistically significant improvement in patients awareness and their attitudes immediately after programming regarding the importance of stem cell in their treatment. Moreover, the result of this study found a statistically significant correlation between patients' awareness and their attitudes where Results of this study revealed that evidence-based intervention was beneficial since patients' awareness was enhanced and their attitude was improved. Considering these

results, stem cells concept and importance of it in the treatment of patients with chronic disease should be incorporated into health education in outpatient clinic and hospitals and in the community to increase awareness of people. So, the authors recommended exploring new issues related to the importance of stem cell therapy in different diseases in future orthopedic with more size of the sample.

VI. RECOMMENDATIONS

This study discovered that there is a statistically significant correlation between patients' awareness and their attitudes.

The study recommended

1. Improving patients knowledge and their attitudes by encouraging patients to attend health education about new trends about their treatments.
2. A well organized and structured continuous learning program should be established at hospitals for patients.
3. Health care providers should take time to explain in depth on stem cell medical care in clinical setting .
4. Studies on similar context but with wider scope and much larger sample size are recommended to confirm finding of this study.
5. The future studies must be the promises of cures for human ailments by stem cells have been much touted but many obstacles must still be overcome.
6. First, more human pluripotent and multipotent cell research is required since the biology of the stem cell differs in men.
7. Second, the common feature of unlimited biological process shared by cancer cells and pluripotent stem cells should be better understood in order to avoid cancer formation.
8. Third, the ability to acquire large numbers of the proper cells at the proper stage of differentiation should be control.
- Fourth, specific protocols should be developed to reinforce the production, survival, and integration of transplanted cells.
9. Finally, clinical trials must be completed to assure the safety and efficacy of stem cell therapy. When it involves stem cells, knowing they exist may be a good distance from using them therapeutically.

ACKNOWLEDGEMENTS

The authors would like to thank the study participants at the General and Alnasr, Alzhor hospitals , and Port Fouad Hospital, at Port Said City, Egypt for their time and effort.

REFERENCES

- [1] King R. Stansfield W. and Mulligan P. (2006): A dictionary of genetics, 7th ed. Oxford. p425.
- [2] Becker, E., McCulloch and Till J. (2014). Pillars Article: Cytological Demonstration of the Clonal Nature of Spleen Colonies Derived from Transplanted Mouse Marrow Cells. *Nature*. 1963. 197:452-454, *J Immunol* June 1, 2014, 192 (11) 4945-7.
- [3] Siminovitch L., McCulloch A., Till J. (1963). "The distribution of colony-forming cells among spleen colonies". *Journal of Cellular and Comparative Physiology* 62: 327–36. doi:10.1002/jcp.1030620313. PMID 14086156.
- [4] Tuch B. (2006). "Stem cells—a clinical update". *Australian Family Physician* 35 (9): 719–21. PMID 16969445.
- [5] Zhang S.,(2004):Nerve cells derived from human embryonic stem cells. *PNAS* 101(34):12543, , National Academy of Sciences, U.S.A. at the University of Wisconsin–Madison.
- [6] Daryono B. , Lia Sari Rahmatin, L. and Aprilia I. (2018) : PAPER MOLECULAR GENETICS “STEM CELL”,Biology Education B Class biology education graduate program yogyakarta state university .
- [7] Al-Karim ,S. and AL-Refaei,Gh. I. (2018): Work shop of Isolation and culture mesenchymal stem cells from placenta and umbilical cord . Embryonic stem cell unit, King Fahad center for medical research.
- [8] David J. Eve, Phillip J. Marty, Robert J. McDermott, Stephen K. Klasko, and Paul R. Sanberg (2008): Stem Cell Research and Health Education, *Am J Health Educ.* 2008 ; 39(3): 167–179. doi:10.1901/jaba.2008.39-167.

- [9] Saleh, A.A., & Ghadeer I. A. (2017). Workshop of Isolation and culture mesenchymal stem cells from placenta and umbilical cord, Embryonic stem cell unit, King Fahad center for medical research
- [10] Hematopoietic Stem Cell Bank Program (2005): <http://www.nap.edu/catalog/11269.html>
- [11] Tuch BE (2006): "Stem cells—a clinical update". *Australian Family Physician* 35 (9): 719–21. PMID 16969445
- [12] Jaenisch R, Young R. (2008) :Stem cells, the molecular circuitry of pluripotency and nuclear reprogramming. *Cell*. 132:567–82. doi: 10.1016/j.cell.2008.01.015. [PMC free article] [PubMed]
- [13] Wei L, Wei Z, Jiang M, Mohamad O, Yu SP.(2017): Stem cell transplantation therapy for multifaceted therapeutic benefits after stroke. *Prog Neurobiol*. 2017 pii: S0301-008230115-0. doi: 10.1016/j.pneurobio.2017.03.003. [PMC free article] [PubMed]
- [14] Zheng Z Wei, Yan-Bing Zhu, James Y Zhang, Myles R McCrary, Song Wang, Yong-Bo Zhang, Shan-Ping Yu, and Ling ,W (2017): Priming of the Cells: Hypoxic Preconditioning for Stem Cell Therapy *Oct 5; 130(19): 2361–2374*. doi: 10.4103/0366-6999.215324
- [15] Centers for Disease Control and Prevention. Public health and aging: trends in aging—United States and worldwide. *JAMA*. 2003;289:1371–1373. [PubMed]
- [16] Crimmins EM. Trends in the health of the elderly. *Annu Rev Public Health*. 2004;25:79–98. [PubMed]
- [17] van Weel C. Chronic diseases in general practice: the longitudinal dimension. *Eur J Gen Pract*. 1996;2: 17–21.
- [18] Fried L., Bandeen-Roche K, Kasper J, Guralnik M. Association of comorbidity with disability in older women: the Women’s Health and Aging Study. *J Clin Epidemiol*. 1999;52:27–37. [PubMed]
- [19] van den Akker M, Buntinx F, Metsemakers JF, Roos S, Knottnerus JA. Multimorbidity in general practice: prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *J Clin Epidemiol*. 1998;51:367–375. [PubMed]
- [20] House JS, Kessler RC, Hergoz AR. Age, socioeconomic status, and health. *Milbank Q*. 1990;68: 383–411. [PubMed]
- [21] Chandola T, Ferrie J, Sacker A, Marmot M. Social inequalities in self reported health in early old age: follow-up of prospective cohort study. *BMJ*. 2007;334: 990–997. [PMC free article] [PubMed]
- [22] Alessandra M., Anita K. and Laura F.(2008): Prevalence of Chronic Diseases and Multimorbidity Among the Elderly Population in Sweden ,*Am J Public Health*. 2008 Jul;98(7):1198-200. doi: 0.2105/AJPH.2007.121137.
- [23] Zühre, K., Gültekin, K., Demirtaş, O., Karadeniz, D. & Çalapkulu, Y. (2015). Effects of Targeted Education for First-Year University Students on Knowledge and Attitudes about Stem Cell Transplantation and Donation. *Official Journal of the Middle East for Organ Transplantation*, 2015; 13(1), 76-81.
- [24] Mohammed, H. and EL Sayed, H. (2015). Knowledge and Attitude of Maternity Nurses Regarding Cord Blood Collection and Stem Cells: An Educational Intervention. *Journal of Nursing Education and Practice*, 5(4), 58-69.
- [25] Kumaraswamy, S. and Muthulakshmi, P. (2010). Umbilical Cord Stem Cell Collection, Preservation, and Utilization. *Nightingale Nursing Times*, 6(1), 7-16.
- [26] Lye, J. , Soon, L., Nizam, W., Ahmad, W. and Tan, S. (2015). Knowledge and Attitude about Stem Cells and Their Application in Medicine among Nursing Students in University Saints Malaysia, *Malays Journal of Medical Science*, 22(4), 23-31.
- [27] Sahin, N. and Dinc, H. (2009). Pregnant Women's Knowledge and Attitudes about Stem Cells and Cord Blood Banking. *International Nursing Review*, 56, 250–6.
- [28] Bombas, T., Costa, R., Palma. F., Vicente, L., Nogueira, A., and Andrade, S. (2012). Knowledge, Attitude and Practice Survey among Portuguese Gynecologists Regarding Combined Hormonal Contraceptives Methods. *European Journal Contraception Report Health Care*. 17(2), 128-34.