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Nursing Students' Knowledge, Beliefs and Self Efficacy about Osteoporosis by Using Two Methods of Learning

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Abstract: *Student's self efficacy refers to student's judgments of performance capabilities in a given domain of activity such as classroom learning of cognitive skills.*
Aim*: To evaluate nursing students' knowledge, beliefs and self efficacy about osteoporosis by using two methods of learning.*
Design*: A quasi experimental design was used.*
Setting: *Faculty of Nursing –Ain Shams University.*
Sample*: A purposive sample of 60 students in the first academic year from both sexes was divided randomly into 2 equal groups. The 1st group applied lecture as a traditional method, while the 2nd group applied self directed learning.*
Tools for data collection: *Self administered questionnaires: Student's characteristics, Nursing student's knowledge about predisposing factors of osteoporosis, nursing student's health beliefs towards osteoporosis; Osteoporosis self-efficacy; and Osteoporosis Chances: Nursing student's knowledge about level of patient's chance of getting osteoporosis.*
Results: *There were statistically significant differences between both groups as regards students' level of knowledge about predisposing factors pre/post and after 3wks. There was percentage change about their health beliefs as pre/post. Self-efficacy scores in both groups as pre/post application were statistically significantly differences. Percentage change was observed in both groups pre/post application as regards level of student's knowledge about patient's chance of getting osteoporosis. Correction among student's knowledge, beliefs and self efficacy in both groups was found.*
Conclusion: *Nursing students' knowledge was improved significantly with positive changes as regards health beliefs and self efficacy. There were positive correlations among three variables of the study: students' knowledge, health beliefs and their self efficacy.*
Recommendation: *Appling different methods of learning for first academic year of nursing students to reach the best of learning process.*
Key words: *Health beliefs - Knowledge - Learning methods - Osteoporosis - Self efficacy.*

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What is already known about the topic?

- According to data survey from the Egyptian National Nutrition Institute to determine bone mass density among the elderly in 2001 and, among adolescents and adults in 2004 revealed that, osteoporosis is a major health problem in Egypt.
- About half of male adolescents and more than one-quarter of females in the same age group were relatively osteopenic (Cairo University Hospitals, 2012).

What is this paper add?

- Increasing awareness, knowledge, and promoting healthy behaviors about osteoporosis and maintaining strong bone throughout the life-span help nurses to provide health teaching for their patients.
- Applying different methods of learning in the first academic year is needed to reach the best of learning process.

I. Introduction:

Generally, learning styles are overall patterns that provide direction to learning and teaching. Learning style can also be described as a set of factors, behaviors, and attitudes that facilitate learning for an individual in a given situation. Styles influence how students learn, how teachers teach, and how the two interact. These learning styles are characteristic cognitive, affective, and physiological behaviors that serve as pretty good indicators of how learners perceive, interact with, and respond to the learning environment (Sywelem et al., 2012).

The incidence of osteoporosis occurrence, in Egypt, according to data survey from the Egyptian National Nutrition Institute, it was reported that nearly 70 to 80 percent of adult bone mass density is attained by the age of 18 years. In the 40 to 50 years age group, 42 percent of females and 43percent of males had low bone mass density, while a third of the elderly population of both sexes (65 to over 80 years of age) were osteoporotic. The unexpectedly high prevalence of low bone mass density among Egyptians, especially adult men could be explained by increased smoking, reduced physical activity and increased consumption of soft drinks, in addition to low calcium intake, low omega 3 fats in diets and increasing animal protein intake (Cairo University Hospitals, 2012).

Osteoporosis is a significant global public health issue, expected to affect more people worldwide than ever by 2050, and by the end of 2010, approximately 12 million people over the age of 50 years will have osteoporosis with another 40 million being osteopenic. These numbers are expected to increase to 14 million cases of osteoporosis and over 47 million cases of low bone mass in 2020. This increase may cause the number of hip fractures to triple by 2040 (Allison et al., 2011).

Osteoporosis is defined by the World Health Organization as a bone mineral density of 2.5 standard deviations or more below the mean peak bone mass young, as measured by dual-energy X-ray absorptiometry. It included the presence of a fragility fracture. Osteoporosis is called silent killer and most common in women after menopause is referred to as primary type 1 or postmenopausal osteoporosis. Primary type 2 osteoporosis or senile osteoporosis occurs after age 75 and is seen in both females and males at a ratio of 2:1. Secondary osteoporosis may arise at any age and affect men and women equally. The risk of osteoporosis fractures can be reduced with lifestyle changes and in those with previous osteoporosis related fractures' medications, the lifestyle change includes diet, exercise, preventing falls, and the utility of calcium and vitamin D is questionable in most (World Health Organization, 2014).

Nursing assessment of a patient's absolute risk of osteoporosis-related fractures, based on his or her clinical risk factors and bone mineral density, should guide management and the presence of a fragility fracture increases the risk of further fractures and should be considered in the assessment as well lifestyle modification and pharmacologic therapy should be determined on an individual basis to enhance adherence to the treatment plan(Rice et al.,2014).

Learning self efficacy enhances motivated learning or motivated to acquire knowledge and skills. Students who have a low sense of efficacy for acquiring cognitive skills may attempt to avoid tasks. The students who have a high sense of efficacy for learning should expand greater effort and persist longer than those who doubt their capabilities (Claire& Elizabeth, 2009). Self directed learning such as small group discussion, an alternative method of teaching may improve students' critical thinking and have several opportunities to think, analyze and evaluate the obtained new knowledge. In the current nursing education, the lecturing is used as the main method of teaching, especially understanding education (Wanida et al., 2009; & Lucy, 2013).

Aim of the study:

To evaluate nursing students' knowledge, beliefs and self efficacy about osteoporosis by using two methods of learning through the following:

1- Assessing nursing students' knowledge, health beliefs and their self efficacy before application of learning methods.

2- Designing and implementing the learning methods according to the first academic students' level.

3- Evaluating the effect of learning methods on nursing students' knowledge, health beliefs and self efficacy about osteoporosis.

Hypotheses:
1-The level of nursing students' knowledge as regards osteoporosis will improve significantly after application of learning methods.
2- Positive changes will improve significantly nursing students' health beliefs and their self efficacy towards osteoporosis after application of learning methods.
3- There will be a positive relation among three variables of the study :students' knowledge, health beliefs and their self efficacy.

II. Subjects and Methods:

A quasi experimental design was used to conduct this study. The study was carried out in the Faculty of Nursing, –Ain Shams University (first academic year). A purposive sample was used in the current study and was choice from undergraduate nursing students in the first academic year in both sexes (60) as well were divided randomly into 2 equal groups. Both groups were exposed to two different learning methods in the classrooms (Traditional lecture & Self directed learning), according to inclusive criteria: All participants are newly registered in the first academic year, and they haven't attended any courses about osteoporosis.

Tools for data collection:
A self administered questionnaire was used to collect data, it contained 5 parts:
Part1- Student's Characteristics: It was used to collect data of the studied nursing students about; their age, and gender.

Part2- Osteoporosis Questionnaire: It was used to assess the level of the nursing student's knowledge about predisposing factors of osteoporosis pre/post application of the learning methods and after 3weeks. It was developed by Ailinger et al. (1998), and was modified by the researchers to suite the study's aim. This tool consisted of 20items .The student responds true, or false, or don't know, under subscales as regards nutrition, drug intake, weight, daily living habits, age, and exercise. Scoring system: A right answers scored 1, while the wrong answer or don't know scared zero. Total possible scores range from 0-20.The level of satisfaction was considered ≥75%, while unsatisfactory was <75%. Reliability coefficients (Cronbach's alpha) ranged from 0.75 to 0.82.

Part3- Osteoporosis Health Beliefs: It was used to measure the nursing student's health beliefs towards osteoporosis disease pre/post teaching counseling and at the end of follow-up period. This tool was adopted from Ailinger and Emerson (1998) and was modified by the researchers to suite the study's aim. This tool included 5 subscales: Susceptibility to osteoporosis, seriousness of developing osteoporosis, benefits of calcium intake, benefits of exercise, and health motivation for preventing the development of osteoporosis. Each subscale included 8 items. The response for each item ranges from 1 (disagree) to 3 (agree).The total possible score ranges from 40 to 120, and a higher total mean score indicates higher agreement of their health belief. Reliability coefficients (Cronbach's alpha) ranged from 0.87 to 0.95.

Part4-Osteoporosis Self-Efficacy: It was used to assess the level of nursing student's confidence in performing risk reduction behaviors focusing on exercise (10items) and calcium rich diet intake(11 items) pre/post application of learning methods. This tool was adopted by Horan and Gendler (1991) and modified by the researchers to suite the study's aim and included 21-items. The possible score for each item ranges from 1 (not at all confident) to 10 (very confident) .A higher total mean score indicates higher self-efficacy .The total possible score ranges from 21 to 210. Reliability coefficients (Cronbach's alpha) ranged from 0.75 to 0.81.

Part5- Osteoporosis Chances: It was used to assess the nursing student's knowledge about level of patient's chance of getting osteoporosis according to three chances: more likely to get osteoporosis (ML) ,less likely to get osteoporosis(LL) ,and it has nothing to do with getting osteoporosis(N), The response for each item ranges from 3 (ML) to 1 (N). This tool was adopted from Pande et al. (2000) and modified by the researchers according to the study's aim. This scale consisted of 8 items involved, eating habits (dairy milk& dark green leafy vegetables), being menopausal, and bone shape, past history of disease, ovaries surgery, cortisone treatment and exercise regularity. The total possible score ranges from 40 to 120 and a higher total mean score indicates higher more likely to get osteoporosis. Reliability coefficients (Cronbach's alpha) ranged from 0.71 to 0.80.

Face and content validity:
It was ascertained by a group of experts from Medical– Surgical Nursing. Their opinions were elicited regarding to the tools format layout, consistency, scoring system. Contents of the tools were tested regarding to the knowledge accuracy, relevance and competence.

Ethical consideration:
Students' participation was anonymous and voluntary. The Dean of the Faculty gave permission for the data collection. Before questionnaires distribution, the purpose of the study was explained. Students were informed that all information will be kept confidential, and that they have the right for withdrawal at any time without giving any reason. Students were informed that the questionnaires have no effect on their academic year.

Pilot study:
A pilot study was conducted including 6 students (10%) from the study sample .No modifications were made and all students were included in the main study sample.

Field work:
The study was carried out in the first semester of the academic year 2013-2014. The approval was taken by official letter issued from Dean of the Faculty of Nursing, Ain Shams University and Head of Nursing Department before study application. Tools were reviewed for validity by five experts from the Medical Surgical Nursing specialty.

Learning methods construction was divided into three phases:
Preparatory phase: Pre-intervention.
The researchers developed the current study tools after reviewing of related literature and others' researches. Participants were divided randomly into two equal groups: The **first group**: Lecture's group (LG) as a traditional method, consisted of 30students; the teacher is –centered of teaching. Meanwhile the second group: Self directed learning's group i.e. group discussion (GD) was divided into 4 subgroups and the student is –centered of teaching under complete supervision by the researchers. As well the researchers explained to all participants the objective of this and deadline.

Planning and intervention phase:
The pre test was done for all participants according to study tools in order to assess their level towards knowledge, health beliefs and self efficacy as regards osteoporosis disease.

The first group: The lecture's group (LG) having the course study in the classroom, and each one was handled a copy of the lecture before starting the teaching. The time of learning was 8 hours 2hrs for each session as follows: The first session involved definition and predisposing factors; the second session, involved incidence of osteoporosis and complications; the third session, involved health beliefs towards osteoporosis and health teaching; while the last session involved revision and summary.

Method of teaching: This group used lecture and discussion as a traditional method and was not allowed to use other sources of learning to avoid contamination of results.

The second group: group discussion (GD) were having the course study units as self directed learning in the classroom, through the researchers, who divided them into 4 subgroups, each one was responsible for preparing the course study units as The first unit, included definition, predisposing factors of osteoporosis; and the second unit was about incidence of osteoporosis and complications; and the third unit was about health beliefs towards osteoporosis; the last unit was related to health teaching and a summary of the course content. Each subgroup was discussing the items under teachers' supervision.

Methods of teaching: Self directed learning method (group discussion).
Media used: Power point—floppy chart.

Intervention steps:
1- The researchers divided each subgroup to7-8 students randomly.
2- The researchers distributed the outlines of the course by units for each group.
3- The researchers guided all subgroups on how to use, textbook's library, and to connect with internet.
4- The researchers give each subgroup 2chances for those having the pass score of each exam.

5- The researchers gave allowed students to ask them at any time about misunderstanding or unclear points during the preparatory phase.
6- Peer evaluation occurred in the second trail among subgroups after one day of the first trial.

Evaluation phase:
The first group: Evaluation of lecture's group was divided into formative and summative. The formative evaluation is done pre/post each session to assess students' level of knowledge. The summative evaluation was done immediately after completing the lecture sessions as a post test to evaluate the three levels of study variables (Knowledge, health beliefs& self efficacy). The follow-up test was done after 3wks of learning style application by the researchers just to evaluate the level of their knowledge. The scoring system determined of the level of three variables in this group.

The second group: For evaluation of the group discussion was divided into formative and summative. The formative evaluation was done by students' themselves after each sub group discussion as a first trial and guided by model answer. The second trial test was done if the student failed to pass in this unit through peer evaluation by the use of a model answer. The student was transferred to another unit if succeeded. When the student couldn't pass in the second trial she/he was excluded from the study.

The summative evaluation was done immediately after completing the course units' content as a post test to evaluate the three levels of study variables (knowledge, health beliefs& self efficacy).The follow-up test was done after 3wks of learning style application by the researchers just to evaluate their knowledge level.

Statistical analysis
Data were analyzed using statistical package for social science (SPSS), version 16 for data collected. Percentage, t-test, chi- square and r-test were used to analyze the collected data. Significance was set at $P \leq .05$ for all tests.

III. Results:

Table (1): reveals that, there are no statistically significant differences between the lecture's group and group discussion as regards their age, all of them are between 17 and 18 years, and registered in the first academic year. As regards gender, more than three quarters of them (83.3%) were females.

Table (2): indicates that there were no statistically significant differences between both groups as regards students' level of knowledge about predisposing factors of osteoporosis pre-application of learning methods about nutrition, drug intake, weight, daily living habits, age and exercise. Meanwhile, in the post application and after 3wks of learning styles there were statistically significant differences between both groups in all items (X2 14.5,6.8,9.4,&36.3 at $p<0.05$ respectively) except for age and exercise there were no differences (X2=1.5&0.4 at $p>0.05$).

Students' health beliefs towards osteoporosis disease in both groups (LG & GD) pre/post application of the learning methods are presented in table (3). There were changes in percentages about their behaviors from disagree to agree pre/post application in lecture's group as regards susceptibility to disease occurrence, seriousness of disease development, benefits of Ca+ intake, benefits of exercise, and health motivation (from 20% to50%, from20% to60%, from40% to 60%, from 0%to60&from 20% to 90% respectively). As well There were changes in percentages about their behaviors from disagree to agree pre/post application in the group discussion for the same items (from30% to90%, from0% to 95%, from15% to95%, from0% to 90% & from 0% to100% respectively).

As regards self-efficacy scores in both groups, pre/post application of learning methods, they are presented in table (4). There were no statistically significant differences pre-application of learning styles as regards their confidence in performing risk reduction behaviors at benefits of Ca+ intake and exercise (t=0.03&0.12 at $p>0.05$ respectively). Meanwhile there were statistically significant differences post-application of learning style (t=10.67&9.04 at $p<0.05$ respectively).

Table (5) shows percentage changes in both groups pre/post application of learning methods, as regards level of student's knowledge about patient's chance of getting osteoporosis. There were change in percentages about their knowledge from nothing to do in getting osteoporosis to more likely to get osteoporosis pre/post application in the lecture's group as,eating dairy milk, dark green leafy vegetables, being menopausal age, bone shape ,past history ,ovaries surgery, cortisone intake, and exercise regularity (from 70% to50%, from90% to50%, from80% to 60%, from 90%to50&from 65% to 60% from 95%to 65% ,from95% to55%from%75%

to65% respectively).As well there were change in percentages pre/post application in group discussion for the same items (from 30% to70%,from85% to95%, from90% to95%, from85% to 95%, from 55%to80&from 70% to 80% from 85%to 95% and ,from65% to95% , respectively).

Table (6) displays the correlations in relation student's knowledge, health beliefs and self efficacy in both groups. Finding reveals that, there were correlations among the three variables (r=0.47 &0.74, respectively).

Table (1): Characteristics of nursing students under study (n=60)

Variables	Lecture's Group (n=30)		Discussion Group (n=30)	
	no	%	no	%
Age (years) 17-18	30	100	30	100
Gender Female Male	20 10	66.7 33.3	25 5	83.3 16.7

Table (2): Level of students' knowledge in both groups as regards predisposing factors of osteoporosis pre/post application and after 3wks of learning methods (n=60)

Variables	**(Pre Application)**		**(Post Application**		**After 3 weeks**	
	LG (n=30)	**GD(n=30)**	**LG(n=30)**	**GD(n=30)**	**LG(n=30)**	**GD (n=30)**
-Nutrition Satisfactory Unsatisfactory	5 25	2 28	10 20	28 2	14 16	29 1
	X=1.46 *		X=9.49		X=14.47	
-Drug intake Satisfactory Unsatisfactory	1 29	1 29	14 16	25 2	18 12	22 8
	X=0.00*		X=8.46		X=6.79	
-Weight Satisfactory Unsatisfactory	3 27	0 30	12 18	21 9	16 14	27 3
	X=3.16*		X=5.45		X=9.39	
-Daily living habits Satisfactory Unsatisfactory -	3 27	5 25	18 12	27 3	24 6	29 1
	X=0.58*		X=7.20		X=36.27	
Age - Satisfactory Unsatisfactory -	13 17	12 18	23 7	28 2	25 5	28 2
	X=0.07*		X=3.27*		X=1.46*	
-Exercise Satisfactory Unsatisfactory	12 18	8 22	27 3	28 2	29 1	28 2
	X=1.20*		X=0.22*		X=0.35*	

P>0.05 Insignificant* P<0.05 Significant

Table (3): Distribution of students' health beliefs towards osteoporosis disease in both groups pre/post application of learning methods. (n=60)

Variables	(L Group) (n=30)						(GroupD) (n=30)					
	Pre-application			Post-application			Pre-application			Post-application		
	D	U	A	D	U	A	D	U	A	D	U	A
	%			%			%			%		
-Susceptibility to disease occurrence	20	50	30	40	10	50	30	50	30	10	0	90
-Seriousness of disease development	20	40	40	40	0	60	0	90	10	0	5	95
-Benefits of Ca+ intake	40	50	10	40	0	60	15	55	30	0	5	95
- Benefits of exercise	0	65	35	20	20	60	0	35	65	0	10	90
- Health motivation	20	50	30	0	10	90	0	20	80	0	0	100

D= Disagree U=Uncertain A=Agree

Table (4): Total mean scores of students as regards self-efficacy in both groups pre/post application of learning methods(n=60)

Student's Confidence in Performing Risk Reduction Behaviors			
Variables	(L Group)	(Group D.)	t-test
	Mean ±SD	Mean ±SD	
- Confidence of Ca+ intake			
Pre application	30.2±19.1	28.6±16.5	0.03
Post application	29.4±14.9	42.1±16.0	10.67
- Confidence of exercise			
Pre application	45.7±13.9	44.0±10.1	0.12
Post application	27.2±18.0	39.2±17.5	9.04

P <0.05 Significant
P >0.05 Insignificant

Table (5): Students' knowledge in both groups about level of patient's chance of getting osteoporosis according to their chances pre/post application of learning methods (n=60)

Variables	(L Group)						(Group D.)					
	Pre-application			Post-application			Pre-application			Post-application		
	M.L	LL	N	ML	LL	N	ML	LL	N	ML	LL	N
	%			%			%			%		
- Eating habits 1-Dairy milk 2-Darkgreen leafy vegetables	20 0	10 10	70 90	50 50	20 30	30 20	35 0	35 15	30 85	70 95	30 5	0 0
3-Being menopausal age	0	20	80	60	40	0	0	10	90	95	5	0
4-Bone shape	0	10	90	50	50	0	0	15	85	95	5	0
5-Past history	25	10	65	60	30	10	30	15	55	80	20	0
6-Ovaries surgery	0	5	95	65	30	5	0	30	70	80	20	0
7-Cortisone intake	0	5	95	55	25	20	0	15	85	95	5	0
8-Exercise regularity	15	10	75	65	15	20	30	5	65	95	5	0

ML=More likely LL=Less likely N=Nothing to do

Table (6): Correlations among studied women as regards to knowledge, health beliefs and attitude.

Correlations in Both Groups		
variables	(L Group)	(G discussion)
Know ledge Health beliefs attitude	r=0.465	r=0.744

IV. Discussion:

Students use different styles to learn, and it is important for them and for their instructors to recognize these styles. Instructors need to use the students' strengths and improve on their weaknesses to facilitate their total comprehensive learning experience. Understanding students learning styles' preferences will help educators to prepare the students to face the changing society opportunities **(**Fleming et al., 2011). As regards the characteristics of the studied sample, all participants in the current study were in the first academic year in the nursing field, which indicated that this group is without experience about differences between types of learning methods and may lead to clear results of this study. In the same context, James et al. (2011) reported that the first year of nursing students at colleges are struggling to cope with their studies and the unique demands imposed by particular courses. So, this study may give chance for the new students to know the differences between types of learning methods in their first academic year, and increase experience towards their studies.

In this study, the results indicated that were statistically significant differences between both groups as regards students' level of knowledge about predisposing factors of osteoporosis pre/post application of learning methods in relation to nutrition, drug intake, weight, and daily living habits. Meanwhile, group discussion were having a higher score than the lecture's group post application of the learning styles and three weeks later at follow-up except for their knowledge about age and exercise, where no differences were found. This result was similar to that of Lena, and Karin (2013) in their study on teaching methods, categorized in two groups: the first group is a teacher-centered methods, as a traditional teaching method, only the teacher decides on teaching-learning process, which led to lack of the group's knowledge,; while the second group is a student-centered teaching method and the student is active during the learning process so the result of this group led to having good knowledge.

In the current study, the lecture's group may depend on just the content of the lecture's knowledge, while the group discussions were having widespread knowledge from more than one reference**.** In a similar study carried out by Mohammed et al. (2011), they reported that self directed learning method provides learners with direct feedback, and makes them active learners through exchange of experiences among them and also increases the critical thinking, versus being passive receiver as in the lecture method. On the other hand, decreased achievement of the students taught by lecture restricts their abilities for thinking and makes them totally dependent on the ability of teachers as centered teaching. On the others hands in the a very recent study by Abu Hasheesh et al. (2013), they added that there are advantages in both types of learning methods such as; the group discussion as a teaching method engages students in active dialogue among them about disease by using the different levels of their knowledge and experiences. However the lecture method is a traditional teaching method used in nursing, there are some advantages for lecturing in the way that novice nursing students need teaching on unfamiliar information and how to use the acquired information.

As regards the health beliefs in the both groups there were positive changes in their beliefs towards osteoporosis pre/post application of the learning methods. Meanwhile, this change was higher in the group discussion more than lecture's group in all items. Sywelem et al. (2011), in their study emphasized that any combination of planned learning experiences based on sound theories provide students and groups, the opportunity to acquire information and the skills needed to make quality health decisions. As well, Yuba (2012) study added that knowledge is important for college's students so that they can engage in healthy lifestyle behaviors and identified knowledge as part of cognitive learning. As well the group discussion may having a chance to communicate with other students' critical thinking led to acquire of knowledge affect on their health behaviors response towards osteoporosis versus lecture's group has acquired their knowledge from classroom.

The current study results indicated that there were statistically significant differences between both groups as regards students' self efficacy pre/post application of learning methods about confidence in performing risk reduction behaviors focusing on exercise and calcium rich diet intake. In this respect Dale and Schunk (2008) reported that the lecture has low efficacy alone, because this method tends to produce shallow, surface thinkers who primarily rely on rote memory rather than careful understanding of the content but when it mixed with other active teaching methods such as questioning and group discussion helps the students learning. In congruence, Allison etal. (2011), in their study, clarified that, when students are having strong motivation through learning process, this leads to strong self efficacy towards their perception of the benefits of exercise and calcium intake for patient with osteoporosis. In similar studies carried out by Mohammed et al. (2011), and Kao et al. (2013), they identified self directed learning by using group discussion have been linked with increased student motivation and interest in a subject, and they can be used to allow the application of theoretical concepts to be demonstrated. Thus, bridging the gap between theory and practice, encourages active learning and provides an opportunity for the development of key skills such as communication, group working, problem solving and increases the students' enjoyment of the topic and increases their self efficacy. Those confident in their academic skills expect high marks on exams and expect the quality of their work to reap academic benefits.

As regards student's knowledge in both groups about patient's chance of getting osteoporosis there were positive percentages' change in the group discussion knowledge from "nothing to do," to "more likely to get" osteoporosis pre/post application. These changes were more than in lecture's group as, dairy milk, dark green leafy vegetables, being menopausal age, bone shape, past history ovaries surgery, cortisone intake, and exercise regularity. These results are congruent with those of similar studies done by Wahba, et al. (2010), entitled "Osteoporosis knowledge, beliefs and behaviors among Egyptian female students" *they highlighted that* because lifestyle practices formed early in life and may be carried into adulthood, there is an immediate need to increase osteoporosis awareness among faculty students in order to obtain the results for raising the student's awareness about risk factors and preventive measures as calcium nutrition and physical activity behaviors. In this point, the type of learning style may affect one group more than others towards their beliefs about seriousness of the osteoporosis disease when there is contact with other students during group discussion.

V. Conclusion:

According to the findings of the current study and study "hypotheses" the following conclusion could be formulated:

(1) Nursing students' knowledge was improved significantly after the application of the learning methods in both groups as regards predisposing factors of osteoporosis about nutrition, treatment, weight, daily living habits, age and exercise.

(2) Positive changes revealed significant improvements of nursing students' health beliefs pre/post application of learning methods in both groups about behaviors from "disagree" to "agree" as regards susceptibility of

disease occurrence, seriousness of disease development, benefits of Ca+ intake, benefits of exercise and health motivation.

(3) There were statistically significant differences pre/post-application of learning methods as regards self-efficacy scores, in both groups about their confidence in performing risk reduction behaviors at confidence of Ca+ intake and exercise.

(4) There were positive correlations among three variables of the study; these were students' knowledge, health beliefs and their self efficacy.

VI. Recommendations:

According to the study results, the following recommendations can be deduced:

(1) Nursing faculties should expose different methods of learning to first year academic nursing students to reach the best teaching method of teaching process.

(2) Students should participate in learning process to build up their self efficacy, knowledge, and health beliefs.

(3) Further research in the field of students learning still needed using a large sample size.

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