

“A True-Experimental Study To Assess The Effectiveness Of Edutainment Through Game-Based Learning On Knowledge Regarding Wholesome Eating Habits Among Primary School Children In Selected Government Schools At Surat District, Gujarat”



Dr. Ashwini Patil¹, Dr. Sateesh Biradar²

¹ Associate Professor, P P Savani School Of Nursing, P P Savani University, Surat, India, Orchid Id: 0009-0005-3338-5327, ashwini.patil@ppsru.ac.in

²Registrar, P P Savani University, Surat, India, Orchid Id: 0000-0003-2629-8880, sateesh.biradar@ppsru.ac.in

ABSTRACT:

This study, titled "A True-Experimental Study to Assess the Effectiveness of Edutainment through Game-Based Learning on Knowledge Regarding Wholesome Eating Habits among Primary School Children in Selected Government Schools at Surat District, Gujarat", aims to explore the impact of game-based learning on children's understanding of healthy eating habits. The experimental design was employed with two groups—control and experimental—each consisting of 50 participants. The study's primary objective is to assess how edutainment, specifically through interactive games, enhances knowledge and influences children's dietary behaviors. Pre- and post-test evaluations were conducted to measure the effectiveness of the intervention. Statistical tools, including paired "t-tests" and chi-square tests, were applied to determine significant differences and associations between demographic variables and knowledge scores. The results involved 9- to 11-year-old children evenly distributed across age and gender in both experimental and control groups. Participants were predominantly from rural areas, with the experimental group showing higher diversity in religion and sources of knowledge about wholesome eating habits. Pre-test knowledge levels were comparable between groups, but the experimental group demonstrated a significant post-test improvement (mean knowledge score increased from 48.2% to 77.9%, $p < 0.001$), unlike the control group, where changes were negligible. The intervention's effectiveness was evident as inadequate knowledge in the experimental group dropped from 60% to 6%. No demographic factors were significantly associated with knowledge improvement post-intervention, affirming the universal applicability of edutainment as a learning tool. Statistical comparisons further validated the intervention's success in enhancing knowledge on wholesome eating habits.

Keywords: Edutainment, Game-Based Learning, Wholesome Eating, Primary School Children, Experimental Study, Health Education.

INTRODUCTION:

The prevalence of poor dietary habits among children is a growing concern, according to statistics in India approximately 33% of children are underweight. This composite measure reflects both chronic and acute under nutrition. India ranks poorly with a score indicating a serious level of hunger. Child under nutrition is a significant contributor to India's GHI score. Around 40% of children in Gujarat are underweight. The data underscores the importance of initiatives like game-based learning in promoting wholesome eating habits among school children to combat these alarming trends.

At primary school children age is a period of rapid growth in human development emotional development is seen such as self-consciousness and one's values are established in addition to physical development. Balanced and sufficient nutritional intake is most essential for children to promote growth and development, to protect and maintain health, to prevent nutritional deficiency conditions

and various illnesses and to reserve for starvation and dietary stress. Primary school age children are insufficient of general knowledge on their own health and nutrition and are not aware of the importance of health, and thus select foods on the basis of preference without proper judgment to aggravate unbalanced diets..

NEED AND SIGNIFICANCE OF THE STUDY:

Wholesome eating habits contribute to overall health and well-being. Assessing the effectiveness of edutainment in this context helps measure potential long-term health impacts, such as reducing the risk of obesity, promoting physical well-being, and fostering lifelong healthy eating habits.

Evaluate the current level of knowledge among primary school children regarding wholesome eating habits. Understand the existing nutritional practices and awareness among children in Surat District. 4 Game-based learning is known for its interactive and engaging nature. The study can evaluate how this approach captures the attention

and interest of primary school children, making the learning experience more effective and enjoyable.

OBJECTIVES:

The objectives of the study are:

- To assess the knowledge regarding wholesome eating habits among experimental and control group.
- To evaluate the effectiveness of edutainment through game-based learning on knowledge regarding wholesome eating habits among experimental groups.
- To find the association between knowledge scores with selected demographical variables among experimental group.
- To find the association between knowledge scores with selected demographical variables among control group.

HYPOTHESES:

- **H1:** There will be significant difference in knowledge about wholesome eating habits between the control and experimental groups.
- **H2:** Edutainment through game-based learning significantly improves knowledge regarding wholesome eating habits among the experimental group.
- **H3:** There will be significant association between knowledge scores and selected demographic variables among the experimental group.
- **H4:** There will be significant association between knowledge scores and selected demographic variables among the control group.

RESEARCH DESIGN AND METHOD:

A true experimental research design with a pre-test and post-test control group was adopted for the study.

SUBJECT:

A total of 50 students in the experimental group and 50 students in the control group were selected by using simple randomized sampling technique.

STUDY TOOL:

Data was collected by self-administered structured questionnaire.

VARIABLES

DEMOGRAPHIC VARIABLES

In the present study the demographic variables are; age, gender, religion, residence, previous knowledge, source of knowledge.

INDEPENDENT VARIABLES

In the present study independent variable is edutainment through game-based learning.

DEPENDENT VARIABLES

In the present study, dependent variable is wholesome eating habits.

SELECTION CRITERIA:

INCLUSION CRITERIA:

The study includes staff nurses who are:

- Willing to participate in the study
- Age group (e.g., 9- 11 years)
- Parental consent.

EXCLUSION CRITERIA:

The study excludes staff nurses;

- Who are not willing to participate
- Children with medical conditions
- Previous participation
- Children who are expected to transfer to another school

TOOL USED IN THE STUDY:

SECTION-I DEMOGRAPHIC VARIABLE

Demographic variable collects the data about the characteristics of the sample population. The participants were requested to provide necessary information on the characteristics by placing tick mark on appropriate answer. It includes age, gender, religion, residence, previous knowledge, source of knowledge.

SECTION-II KNOWLEDGE QUESTIONNAIRES

In the present study, the knowledge questionnaires was: What is a balanced diet, How many servings of fruits and vegetables should you eat each day, What are the benefits of drinking water regularly, What are the consequences of skipping breakfast, What are the health benefits of including whole grains in your diet, How does physical activity contribute to a healthy lifestyle, What are some healthy snack options you can choose from, What are the benefits of eating fiber-rich foods, How can parents and schools work together to promote healthy eating habits, How does media influence food choices among children, What are the consequences of consuming too much salt (sodium), How does stress influence food choices, What are some strategies to encourage children to try new and healthy foods, How can you , make sure you are eating a balanced and nutritious diet every day, How does eating junk food affect your health, Why is it important to limit the intake of sugary drinks and snacks, What are the effects of inadequate sleep on eating habits, What are the benefits of eating a variety of foods, How can peer pressure affect food choices, Why is it important to eat a variety of foods.

DATA COLLECTION PROECEDURE:

The procedure for data collection in the study titled "A Study to Assess the Effectiveness of Edutainment through Game-Based Learning on Knowledge

Regarding Wholesome Eating Habits among Primary School Children in Selected Government Schools at Surat District, Gujarat" involves several key steps. These steps ensure systematic and consistent data collection to accurately assess the intervention's effectiveness.

1. Preparation Phase

a. **Ethical Approval:** Obtain ethical clearance from the institutional review board (IRB) to ensure the study adheres to ethical standards.

b. **Permission:** Secure permission from the Surat District education authorities and the principals of the selected government schools.

c. **Consent:** Obtain informed consent from the parents or guardians of the participating children. Additionally, get assent from the children themselves.

2. Sample Selection

➤ **Random Sampling:** Use a random sampling technique to select a representative sample of primary school children from the selected government schools in Surat District.

➤ **Inclusion Criteria:** Define clear inclusion criteria, such as age group (e.g., 9- 11 years), willingness to participate, and parental consent.

➤ **Exclusion Criteria:** Children with medical conditions that affect their dietary habits or

cognitive abilities, which might confound the study results, previous participation, Children who are expected to transfer to another school during the study period.

3. Baseline Data Collection

a. **Pre-Intervention Survey:** Administer a pre-intervention questionnaire to assess the baseline knowledge of the children regarding wholesome eating habits.

b. **Demographic Information:** Collect demographic data including age, gender, socio-economic status, and other relevant variables.

4. Intervention Phase

a. **Edutainment Sessions:** Implement the edutainment program using game-based learning activities designed to teach children about wholesome eating habits. The sessions should be interactive and engaging.

5. Post-Intervention Data Collection

• **Post-Intervention Survey:** After completing the edutainment sessions, administer the same questionnaire used in the pre-intervention phase to assess changes in knowledge.

• **Observation and Feedback:** Collect observational data and feedback from the children and teachers about the edutainment sessions to gauge engagement and effectiveness.

ANALYSIS AND FINDINGS:

The data findings based on the objectives have been organized and finalized according to the plan for data analysis and are presented under the following sections.

SECTION 4.1: Analysis and interpretation of the demographic variables of the children in experimental and control group

SECTION 4.2: Analysis and interpretation of the assessment of the effectiveness of edutainment through game-based learning on knowledge regarding wholesome eating habits among primary school children in control and experimental group.

SECTION 4.3: Analysis and interpretation of the association between the pre-test knowledge levels in the experimental group and selected demographic data

SECTION 4.1: Analysis and interpretation of the association between the pre-test knowledge levels in the experimental group and selected demographic data.

TABLE 4.1: Distribution of subjects according to their demographic variables.

N=100

Demographic variables	Experimental group (n=50)		Control group (n=50)	
	F	%	F	%
1.Age in years:				
• 9 years	14	28	5	5
• 10 years	20	40	17	17
• 11 years	16	32	28	28
2.Gender:				
• Male	22	22	22	22
• Female	28	28	28	28

3.Religion:				
• Hindu	44	88	50	100
• Muslim	6	12	0	0
• Christianity	0	0	0	0
4.Residence:				
• Urban	3	6	1	2
• Rural	47	94	49	98
5.Previous knowledge:				
• Yes	39	78	44	88
• No	11	22	6	12
6.Source of knowledge:				
• Nil	11	22	06	12
• TV & Social media	6	12	02	04
• Video games	13	26	02	04
• Class room	12	24	37	74
• Family	8	16	03	06

SECTION 4.2: Analysis and interpretation of the assessment of the effectiveness of edutainment through game- based learning on knowledge regarding wholesome eating habits among primary school children in control and experimental group

Table 4.2.1: Mean, SD, and Mean% in Control Group Knowledge Regarding Wholesome Eating Habits among Primary School Children

level of knowledge	Max score	Pre test			Post test			Difference in mean%
		Mean	SD	Mean%	Mean	SD	Mean%	
Overall	20	9.92	3.74	49.6	9.98	3.74	49.9	0.3

Table 4.2.2: Mean, SD, and Mean% in Experimental Group Knowledge Regarding Wholesome Eating Habits among Primary School Children

level of knowledge	Max score	Pretest			Post test			Difference in mean%
		Mean	SD	Mean%	Mean	SD	Mean%	
Overall	20	9.64	2.79	48.2	15.58	3.03	77.9	29.7

Table-4.2.3: The data indicates the effectiveness of edutainment through game-based learning in enhancing children's knowledge about wholesome eating habits, as shown by the improvement in the experimental group and control group.

Level of knowledge	Experimental group				Control group			
	Pre test		Post test		Pre test		Post test	
	f	%	F	%	f	%	f	%
Inadequate	30	60	3	6	29	58	26	52
Moderate	18	36	18	36	14	28	17	34

Adequate	2	4	29	58	7	14	7	14
Overall	50	100	50	100	50	100	50	100

Table 4.2.4: Shows the results of the paired "t"-test in the control group, assessing the difference in knowledge regarding wholesome eating habits between pre-test and post-test.

Level of knowledge	Control pre test		Control post test		Mean difference	t'-value	P-value
	Mean	SD	Mean	SD			
Overall	9.92	3.74	9.98	3.74	0.06	1.768	0.083 (NS)

*-P<0.05, significant and **-P<0.01 &***-P<0.001, highly significant

Since the P-value is greater than 0.05, the difference between the pre-test and post-test knowledge scores is not statistically significant in the control group.

Table 4.2.5: This table presents the paired "t"-test results for the experimental group, evaluating the effectiveness of edutainment through game-based learning on knowledge regarding wholesome eating habits.

Level of knowledge	Experimental pre test		Experimental post test		Mean difference	t'-value	P-value
	Mean	SD	Mean	SD			
overall	9.64	2.79	15.58	3.03	5.94	10.97	p<0.001*** (HS)

*-P<0.05, significant and **-P<0.01 &***-P<0.001, highly significant

The statistically significant improvement ($P < 0.001$) in the experimental group's knowledge after the intervention highlights the effectiveness of edutainment through game-based learning.

Table 4.2.6: Unpaired "t"-test was found between control and experimental group pre-test.

Mean Difference: The mean difference between the control and experimental group in the pre- test phase is 0.28.

t'-value: The calculated t-value is 0.424.

P-value: The p-value is 0.672, which is greater than 0.05, indicating that there is no significant difference in knowledge levels between the control and experimental groups at the pre-test stage.

Level of knowledge	Control pre test		Experimental pre test		Mean difference	t'-value	P-value
	Mean	SD	Mean	SD			
Overall	9.64	2.79	9.92	3.74	0.28	0.424	0.672 (NS)

*-P<0.05, significant and **-P<0.01 &***-P<0.001, Highly significant

Table 4.2.7: The experimental group had a post-test mean score of 15.58 with a standard deviation (SD) of 3.03, while the control group had a mean score of 9.98 with an SD of 3.74. The difference in the mean scores between the two groups is 5.6.

t'-value: The calculated t-value is 8.21, which indicates a large effect size and a significant difference between the groups.

P-value: The p-value is less than 0.001, which is highly significant (HS), meaning that the probability of the observed difference being due to chance is extremely low.

Level of knowledge	Experimental post test		Control post test		Mean difference	t'-value	P-value
	Mean	SD	Mean	SD			
Overall	15.58	3.03	9.98	3.74	5.6	8.21	p<0.001*** (HS)

*-P<0.05, significant and **-P<0.01 &***-P<0.001, highly significant

Since the p-value is less than 0.001, this indicates a highly significant statistical difference.

SECTION 4.3 ANALYSIS AND INTERPRETATION OF THE ASSOCIATION BETWEEN THE PRE-TEST KNOWLEDGE LEVELS IN THE EXPERIMENTAL GROUP AND SELECTED DEMOGRAPHIC DATA

Table 4.3.1: Association for level of knowledge in control group of pre-test and selected demographic data.

N=100

Demographic variables	Inadequate		Moderate		Adequate		χ^2 - value	p-value
	F	%	F	%	f	%		
1.Age in years:								
• 9 years	3	6	2	4	0	0	1.67 (df=4)	0.796 NS
• 10 years	11	22	4	8	2	4		
• 11 years	15	30	8	16	5	10		
2.Gender:								
• Male	17	34	4	8	1	2	6.37 (df=2)	0.041* S
• Female	12	24	10	20	6	12		
3.Religion:								
• Hindu	29	58	14	28	7	14	0 (df=1)	1 NS
• Muslim	0	0	0	0	0	0		
• Christianity	0	0	0	0	0	0		
4.Residence:								
• Urban	1	2	0	0	0	0	0.738 (df=2)	0.691 NS
• Rural	28	56	14	28	7	14		
5.Previous knowledge:								
• Yes	24	48	14	28	6	12	2.69 (df=2)	0.259 NS
• No	5	10	0	0	1	2		
6.Source of knowledge:								
Nil	5	10	0	0	1	2	14.02 (df=8)	0.081 NS
TV & Social media	2	4	0	0	0	0		
Video games	2	4	0	0	0	0		
Class room	20	40	13	26	4	8		
Family	0	0	1	2	2	4		

* $p < 0.05$ significant, ** $p < 0.01$ & *** $p < 0.001$ Highly significant.

Table 4.3.2: Association for level of knowledge in control group of pre-test and selected demographic data.

N=100

Demographic variables	Inadequate		Moderate		Adequate		χ^2 - value	p-value
	F	%	f	%	F	%		
1.Age in years:								
• 9 years	3	6	2	4	0	0	1.67 (df=4)	0.796 NS
• 10 years	11	22	4	8	2	4		
• 11 years	15	30	8	16	5	10		
2.Gender:								
• Male	17	34	4	8	1	2	6.37 (df=2)	0.041* S
• Female	12	24	10	20	6	12		
3.Religion:								
• Hindu	29	58	14	28	7	14	0 (df=1)	1 NS
• Muslim	0	0	0	0	0	0		
• Christianity	0	0	0	0	0	0		
4.Residence:								
• Urban	1	2	0	0	0	0	0.738 (df=2)	0.691 NS
• Rural	28	56	14	28	7	14		
5.Previous knowledge:								
• Yes	24	48	14	28	6	12	2.69 (df=2)	0.259 NS
• No	5	10	0	0	1	2		
6.Source of knowledge:								

Nil	5	10	0	0	1	2	14.02	0.081
TV & Social media	2	4	0	0	0	0	(df=8)	NS
Video games	2	4	0	0	0	0		
Class room	20	40	13	26	4	8		
Family	0	0	1	2	2	4		

*p<0.05 significant, ** p<0.01 & ***p<0.001 Highly significant.

Table 4.3.3: Association for level of knowledge in experimental group of post-test and selected demographic data.(N=100)

Demographic variables	Inadequate		Moderate		Adequate		χ^2 - value	p-value
	F	%	f	%	f	%		
1.Age in years:								
9 years	0	0	6	12	8	16	7.71	0.103
10 years	2	4	10	20	8	16	(df=4)	NS
11 years	1	2	2	4	13	26		
2.Gender:								
Male	1	2	11	22	10	20	3.34	0.188
Female	2	4	7	14	19	38	(df=2)	NS
3.Religion:								
Hindu	2	4	17	34	25	50	2.09	0.352
Muslim	1	2	1	2	4	8	(df=2)	NS
Christianity	0	0	0	0	0	0		
4.Residence:								
Urban	0	0	2	4	1	2	1.36	0.507
Rural	3	6	16	32	28	56	(df=2)	NS
5.Previous knowledge:								
Yes	1	2	16	32	22	44	4.81	0.090
No	2	4	2	4	7	14	(df=2)	NS
6.Source of knowledge:								
Nil	2	4	2	4	7	14	12.44	0.132
TV & Social media	0	0	2	4	4	8	(df=8)	NS
Video games	0	0	9	18	4	8		
Class room	1	2	3	6	8	16		
Family	0	0	2	4	6	12		

*p<0.05 significant, ** p<0.01 & ***p<0.001 highly significant.

Table 4.3.4: Association for level of knowledge in control group of post-test and selected demographic data.

(N=100)								
Demographic variables	Inadequate		Moderate		Adequate		χ^2 - value	p-value
	F	%	F	%	f	%		
1.Age in years:								
9 years	2	4	3	6	0	0	2.49	0.645
10 years	10	20	5	10	2	4	(df=4)	NS
11 years	14	28	9	18	5	10		
2.Gender:								
Male	15	30	6	12	1	2	5.009	0.089
Female	11	22	11	22	6	12	(df=2)	NS
3.Religion:								
Hindu	26	52	17	34	7	14	0	1
Muslim	0	0	0	0	0	0	(df=1)	NS

Christianity	0	0	0	0	0	0		
4.Residence:								
Urban	1	2	0	0	0	0	0.941	0.624
Rural	25	50	17	34	7	14	(df=2)	NS
5.Previous knowledge:								
Yes	22	44	16	32	6	12	0.919	0.632
No	4	8	1	2	1	2	(df=2)	NS
6.Source of knowledge:								
Nil	4	8	1	2	1	2	12.81	0.118
TV & Social media	2	4	0	0	0	0	(df=8)	NS
Video games	2	4	0	0	0	0		
Class room	18	36	15	30	4	8		
Family	0	0	1	2	2	4		

*p<0.05 significant, ** p<0.01 & ***p<0.001 highly significant.

CONCLUSION:

This study has successfully demonstrated the effectiveness of edutainment through game-based learning in enhancing knowledge about wholesome eating habits among primary school children. The research highlights the potential of interactive, engaging methods to improve health education, moving away from traditional teaching approaches. Game-based learning not only increased students' knowledge but also captured their attention and interest, making the learning experience more meaningful and impactful.

REFERENCE:

- Jones, M. (2020). Game-Based Learning and Child Development, In: Smith, L. (ed.)
- Advances in Educational Psychology*. 3rd ed. New York: Academic Press, pp. 25-48.
- Williams, T. (2019). Nutrition and Learning in Primary Schools, In: Brown, A. (ed.)
- Child Health and Education*. Boston: McGraw-Hill, pp. 112-130.
- Miller, D. (2018). Interactive Learning for Kids, In: Taylor, S. (ed.) *Education in the Digital Age*. 2nd ed. London: Routledge, pp. 45-60.
- Johnson, R. (2021). The Role of Public Health in Education, In: Young, K. (ed.) *Global Public Health Initiatives*. Oxford: Oxford University Press, pp. 34-59.
- Green, E. (2022). Edutainment as a Tool for Learning, In: Parker, J. (ed.) *Innovations in Childhood Education*. 1st ed. New York: Pearson, pp. 90-105.
- Roberts, C. (2020). Using Games for Nutritional Education, In: Lewis, D. (ed.) *Public Health Approaches to Childhood Obesity*. San Francisco: Wiley, pp. 145-170.
- Harris, N. (2017). Play-Based Learning in Primary Education, In: Evans, R. (ed.) *Learning Through Play: A Multidisciplinary Approach*. London: Routledge, pp. 78-102.
- Clark, J. (2019). Digital Games in Health Education, In: Morgan, L. (ed.) *Digital Transformation in Education*. 2nd ed. Chicago: University of Chicago Press, pp. 54-73.
- Adams, B. (2021). The Effectiveness of Game-Based Learning, In: Richards, H. (ed.)
- Studies in Educational Psychology*. 4th ed. Cambridge: Cambridge University Press, pp. 203-225.
- Walker, S. (2022). Strategies for Healthy Eating in Schools, In: Turner, M. (ed.)
- Nutrition Education for Young Learners*. Oxford: Blackwell Publishing, pp. 67-9
- Roberts J. Nursing and emotional resilience: A systematic review of interventions.
- Nurse Educ Today*. 2019; 81:1-13.
- Jackson D, Firtko A, Edenborough M. Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *J Adv Nurs*. 2007;60(1):1-9.
- Alexander GK, Rollins K, Walker D, Wong L,
- Child Health and Education*. Boston: McGraw-Hill, pp. 112-130.
- Miller, D. (2018). Interactive Learning for Kids, In: Taylor, S. (ed.) *Education in the Digital Age*. 2nd ed. London: Routledge, pp. 45-60.
- Johnson, R. (2021). The Role of Public Health in Education, In: Young, K. (ed.) *Global Public Health Initiatives*. Oxford: Oxford University Press, pp. 34-59.
- Green, E. (2022). Edutainment as a Tool for Learning, In: Parker, J. (ed.) *Innovations in Childhood Education*. 1st ed. New York: Pearson, pp. 90-105.
- Roberts, C. (2020). Using Games for Nutritional Education, In: Lewis, D. (ed.) *Public Health Approaches to Childhood Obesity*. San Francisco: Wiley, pp. 145-170.
- Harris, N. (2017). Play-Based Learning in Primary Education, In: Evans, R. (ed.) *Learning Through Play: A Multidisciplinary Approach*. London: Routledge, pp. 78-102.
- Clark, J. (2019). Digital Games in Health Education, In: Morgan, L. (ed.) *Digital Transformation in Education*. 2nd ed. Chicago: University of Chicago Press, pp. 54-73.
- Adams, B. (2021). The Effectiveness of Game-Based Learning, In: Richards, H. (ed.)
- Studies in Educational Psychology*. 4th ed. Cambridge: Cambridge University Press, pp. 203-225.
- Walker, S. (2022). Strategies for Healthy Eating in Schools, In: Turner, M. (ed.)
- Nutrition Education for Young Learners*. Oxford: Blackwell Publishing, pp. 67-9
- Roberts J. Nursing and emotional resilience: A systematic review of interventions.
- Nurse Educ Today*. 2019; 81:1-13.
- Jackson D, Firtko A, Edenborough M. Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *J Adv Nurs*. 2007;60(1):1-9.
- Alexander GK, Rollins K, Walker D, Wong L,

- Pennings J. Yoga for self-care and burnout prevention among nurses. *Workplace Health Saf.* 2015;63 (10):462-70.
26. Kramer M, Schmalenberg C. Development and evaluation of Essentials of Magnetism tool. *J Nurs Adm.* 2004;34(7-8):365-78.
 27. Stanton MW, Rutherford MK. The high concentration of U.S. health care expenditures.
 28. *Res Aging.* 2006;28(3):359-78.
 29. Reed P, Shearer NC. Nursing knowledge and theory innovation. *Nurs Sci Q.* 2011;24(2):133-36.
 30. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA.* 2002;288(16):1987-93.
 31. Kaddourah B, Abu-Shaheen A, Al-Tannir M. Nurses' perceptions of spirituality and spiritual care at five tertiary care hospitals. *Ann Saudi Med.* 2018;38(4):270-76.
 32. Twigg D, Duffield C, Bremner A, Rapley P, Finn J. Impact of skill mix variations on patient outcomes. *J Clin Nurs.* 2011;20(23-24):3085-94.
 33. Fairbrother G, Jones A, Rivas K. Changing model of nursing care from individual patient allocation to team nursing in the acute inpatient environment. *Contemp Nurse.* 2010;35(2):202-20.
 34. Fagermoen MS. Professional identity: Values embedded in meaningful nursing practice. *J Adv Nurs.* 1997;25(3):434-41.
 35. LaSala CA, Bjarnason D. Creating workplace environments that support moral courage. *OJIN Online J Issues Nurs.* 2010;15(3):1-11.
 36. Zangaro GA, Soeken KL. A meta-analysis of studies of nurses' job satisfaction. *Res Nurs Health.* 2007;30(4):445-58.
 37. Schlairet MC, Fenster MJ. Evidence-based nursing practice: Evaluating the rosetree model as a tool for practice change. *J Nurs Adm.* 2008;38(12):516-20.