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Effectiveness of Conventional vs Game Based Oral Health Education on Oral Health Related Knowledge Among School Children in Selected Schools of D&NH

Mariya Mahla[1], N Sriram[2]

[1]M.sc. Nursing, Department of Community Health Nursing, Shri Vinoba Bhave College of Nursing, Silvassa.
[2] Dr. Professor, Department of Medical Surgical Nursing, Shri Vinoba Bhave College of Nursing, Silvassa.

ABSTRACT

Introduction: Overall health and dental health are interdependent and have an impact on one another. The main risk factors for a number of oral diseases are poor oral health habits, smoking, alcohol consumption, and improper food. tooth caries, tooth erosion, periodontitis, oral cancer, and numerous other disorders affecting the soft tissues of the mouth are all influenced by diet.

Aim: The main aim of study is to determine the effectiveness of conventional and game based oral health education on the oral health related knowledge among school children.

Methodology: A quasi-experimental pre-test post-test with comparison group design was adopted. 300 school children were selected from Galonda and Khanvel central primary school, Dadra & Nagar Haveli through Non probability, convenient sampling technique and assigned 150 children from Galonda school as Game based group and 150 children from Khanvel school as Conventional based group. Data was collected from 04.09.24 to 30.09.24. Structured interview schedule was used to assess the knowledge of children regarding oral health. Health teaching regarding oral health through flashcard was given and another group children were made to play snake and ladder game for 7 days under the supervision of the investigator. Post test was conducted on the 8th day after intervention for both groups (game based and conventional group).

Result: The findings of the study revealed that in pre-test, majority of the children 119(79.3%) in game-based group and 132(88.6%) in conventional based group had moderately adequate knowledge and none of them had adequate knowledge in both groups whereas in post-test 150(100%) children in game-based group and 141(94%) in conventional based group had adequate level of knowledge. Conventional group the overall mean pre-test knowledge score was 12.69 and post-test mean knowledge score was 23.56 revealing the difference in mean score of 10.87. Game based group the overall mean pre-test knowledge score was 11.57 and post-test mean knowledge score was 24.82 revealing the difference in mean knowledge score of 13.25. Significant difference was found between area wise and overall scores of post-test between game based group and conventional based group ($t = 6.97$) at $p< 0.001$ level of significance. There is no association with knowledge scores of school children at 0.05 level of significant.

Conclusion: Both methods are effective but Game based method is more effective than the Conventional method to improve the oral health related knowledge of school children.

Keywords: Snake and ladder, Oral health, School children, Flash cards

INTRODUCTION

Everyone has the right to human rights, which are necessary for full personal development. This includes men, women, children, and people of all racial backgrounds. Children have rights in this domain, particularly with reference to their understanding of their health or condition and their ability to choose treatment options and counseling. (Manoj Yadhav, 2010)[1]

A series of behaviors known as hygiene are carried out to maintain health. World Health Organization (WHO) definition of hygiene: "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases." Keeping the body clean is known as personal hygiene. The following categories apply to hygiene activities: personal hygiene, medical hygiene, food hygiene, sleep hygiene, and house and daily hygiene. Hand washing, respiratory hygiene, food hygiene at home, kitchen hygiene, bathroom hygiene, laundry hygiene, and medical hygiene at home are all examples of daily and at-home hygiene.

STATEMENT OF THE PROBLEM

“Effectiveness of Conventional vs Game Based Oral Health Education on Oral Health Related Knowledge Among School Children in Selected Schools of D&NH.”

OBJECTIVES

1. To assess the level of oral health related knowledge among school children
2. To evaluate effectiveness of conventional and game based oral health education on level of oral health related knowledge among school children
3. To find association between pretest level of oral health related knowledge of school children with their selected demographic variables.

HYPOTHESIS

Alternative Research hypothesis

Ha1 - There is significant difference between pre-test and post-test level of oral health related knowledge among convention and game based oral health education group of school children at 0.05 level of significance.

Ha2 - There is significant association between pretest level of oral health related knowledge of school children with their selected demographic variable at 0.05 level of significance.

DELIMITATION

The study is limited to

- school children who are 8 – 10 years old
- the school children of selected central primary schools, Dadra & Nagar Haveli
- who can understand and speak Hindi, Gujarati, Marathi.
- only 4 weeks

- only 300 samples

ASSUMPTION

The study assumes that:

1. Dental carries is a common problem among School children (8-10years).
2. Teaching through play way method (snake and ladder game) may have effect on knowledge related to oral health of the school children.
3. Demographic variables influence the knowledge related to oral health of School children

OPERATIONAL DEFINITIONS

Effectiveness:

It refers to find significant difference in the pre-test and post-test knowledge scores of conventional and game-based education group of school children as measured through structured interview schedule.

Game based (Snake and ladder game) oral hygiene:

It refers to a game played by children, comprises of a check board with the numbers 1-100. The checks are in scripted with positive and negative sentences about oral hygiene. The positive points lead to higher level through ladder and negative point to bring down through snake. The coin moves with the corresponding numbers on the dice.

Knowledge:

According to the oxford dictionary, the information, understanding and skills that are gained through education or experience.[10]

It refers to the correct responses given by school children to the oral health related knowledge items in the structured interview schedule.

School children:

It refers to the children with age group of 8-10 years old and studying in selected schools

Conventional education:

It refers to a learning technique that can help to improve long term memory. The conventional flash card method typically has a question or definition on one side and an answer or term on the other.

RESEARCH METHODOLOGY

RESEARCH APPROACH: Quantitative Research Approach

RESEARCH DESIGN: Quasi Experiment research design - Two group pretest and posttest design

VARIABLES

Independent Variables: Conventional vs Game based oral health education

Dependent Variable: Knowledge related to Oral health

RESEARCH SETTING: Dadra and Nagar Haveli schools (CPS, Galonda & Khanvel)

POPULATION: School age children who belong to the age group 8-10 years

SAMPLE: 300 samples through Convenience sampling (150 in each group)

SAMPLING TECHNIQUE: Non probability, convenient sampling technique

CRITERIA FOR THE SELECTION OF SAMPLES

INCLUSION CRITERIA

Inclusion criteria

School children,

- who are aged between 8 – 10 year
- who can understand and speak Hindi, Gujarati, Marathi.

Exclusion criteria

School children,

- who are not willing to participate in the study
- who are in long leave or absent during data collection period.

DESCRIPTION OF TOOL

The study was organized into two sections

SECTION I Demographic Variables

The demographic profile consists of 10 items such as age, sex, educational status, education of father & mother, occupation of father & mother, type of family, birth order of child and previous information regarding oral health.

SECTION - II STRUCTURED INTERVIEW SCHEDULE QUESTIONNAIRE

Structured Interview schedule to assess the level of knowledge regarding Oral health of school children. The tool consisted of 26 questions under 3 headings namely Oral health (5 questions), Brushing (12 questions) and Diet (9 questions). Each item has 3 options.

Interpretations of the level of knowledge regarding oral hygiene

Score	Percentage	Level of knowledge
0-8	0-33%	Inadequate
9-16	34-66%	Moderate
17-24	67-100%	Adequate

DATA ANALYSIS AND INTERPRETATION

SECTION I: I. Frequency and percentage distribution of demographic variable of school children's

TABLE 4.1.1: Frequency and percentage wise distribution to their demographic variables for child.

(n=300)

Demographic variables for child	Game based group (n=150)		Conventional group (n=150)	
	F	%	F	%
1.Age of the child in years:				

8-9	95	63.3	76	50.7
9-10	55	36.7	74	49.3
2.Gender of the child:				
Male	73	48.7	65	43.3
Female	77	51.3	85	56.7
3. Studying class:				
3rd STD	95	63.3	50	33.3
4th STD	39	26	56	37.3
5th STD	16	10.7	44	29.3
4.Birth of the child:				
One	68	45.3	56	37.3
Two	43	28.7	60	40
Three and above	39	26	34	22.7

Table 4.1.2: Frequency and percentage wise distribution of demographic variables of Parents. (N=300)

Demographic variables for parents	**Game based group (n=30)**		**Conventional group (n=30)**	
	F	**%**	**f**	**%**
1.Education level of father:				
Profession	16	10.7	12	8
Graduate	13	8.7	17	11.3
Intermediate	20	13.3	28	18.7
High school	37	24.7	49	32.7
Middle school	24	16	16	10.7
Primary school	18	12	9	6
Illiterate	22	14.7	19	12.7
2.Education level of mother:				
Profession	4	2.6	2	1.3
Graduate	9	6	5	3.3
Intermediate	16	10.7	7	4.7
High school	42	28	20	13.3
Middle school	28	18.7	49	32.7
Primary school	17	11.3	37	24.7
Illiterate	34	22.7	30	20
3.Occupation of father:				
Profession	12	8	9	6
Semi profession	15	10	20	13.3

Clerical	2	1.3	3	2
Skilled worker	26	17.3	30	20
Semi-skilled worker	43	28.7	37	24.7
Unskilled worker	37	24.7	42	28
Unemployed	15	10	9	6
4.. Occupation of mother:				
Profession	6	4	5	3.3
Semi profession	12	8	9	6
Clerical	0	0	0	0
Skilled worker	12	8	9	6
Semi-skilled worker	9	6	14	9.3
Unskilled worker	48	32	45	30
Unemployed	63	42	68	45.3
5. Type of family:				
Nuclear	80	53.3	76	50.7
Joint	57	38	43	28.7
Extended	13	8.7	31	20.7

SECTION II: Assessment of pre-test and post-test level of knowledge regarding oral health among school children in both group conventional and game-based group

Table-4.2.1: Frequency and percentage distribution on level of knowledge among conventional vs game-based oral health education of school children.

Level of knowledge	Game based group				Conventional group			
	Pre-test		Post test		Pre-test		Post test	
	f	%	f	%	f	%	F	%
Inadequate	31	20.7	0	0	15	10.1	0	0
Moderate	119	79.3	0	0	132	88.6	9	6
Adequate	0	0	150	100	2	1.3	141	94
Overall	150	100	30	100	150	100	30	100

SECTION III: Effectiveness of conventional vs game based oral health related knowledge among school children in both group conventional and game-based group

Table-4.3.1: Analysis of paired "t"-test between pre-test and post-test knowledge score of conventional group of school children.

N=150

Level of knowledge	Conventional group Pre-test		Conventional group Post test		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Related to Oral health	2.21	1.02	4.36	0.68	2.14	19.01	p<0.001***(HS)

Related to Brushing	5.95	1.52	11.33	0.86	5.38	36.92	p<0.001***(HS)
Related to diet	4.53	1.71	7.87	1.21	3.33	15.59	p<0.001***(HS)
Overall	12.69	2.76	23.56	1.88	10.87	33.45	p<0.001***(HS)

Table-4.3.2 Analysis of paired "t"-test between pre-test and post-test knowledge score of game based group of school children. N=150

Level of knowledge	Game based group Pre-test		Game based group Post test		Mean difference	't'-value	p-value
	Mean	SD	Mean	SD			
Related to Oral health	1.85	0.94	4.67	0.47	2.81	34.95	p<0.001***(HS)
Related to Brushing	5.57	1.68	11.61	0.71	6.04	45.27	p<0.001***(HS)
Related to diet	4.14	1.32	8.54	0.95	4.4	28.15	p<0.001***(HS)
Overall	11.57	2.65	24.82	1.17	13.25	56.21	p<0.001***(HS)

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

Table-4.3.3: Analysis of unpaired "t"-test between pretest knowledge scores of game based and conventional group of school children N=300

Level of knowledge	Game based group Pre-test		Conventional group pre-test		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Related to Oral health	1.85	0.94	2.21	1.02	0.36	3.17	p=0.001***(HS)
Related to Brushing	5.57	1.68	5.95	1.52	0.37	2.01	p=0.047*(S)
Related to diet	4.14	1.32	4.53	1.71	0.39	2.23	p=0.026*(S)
Overall	11.57	2.65	12.69	2.76	1.12	3.61	p=0.001***(HS)

Table-4.3.4: Analysis of unpaired "t"-test between post test knowledge scores of game based and conventional group of school children N=300

Level of knowledge	Game based group Post test		Conventional group Post test		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Related to Oral health	4.67	0.47	4.36	0.68	0.31	4.54	p<0.001***(HS)
Related to Brushing	11.61	0.71	11.33	0.86	0.28	3.06	p=0.002**(HS)

Related to diet	8.54	0.95	7.87	1.21	0.67	5.37	p<0.001***(HS)
Overall	24.82	1.17	23.56	1.88	1.26	6.97	p<0.001***(HS)

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

SECTION D: Association between pretest knowledge scores of School children and selected demographic variables

Table 4.4.1: Analysis of chi-square test between knowledge score of game-based group school children and parents and selected demographic variable. N=150

Demographic variables	Inadequate	Moderate	χ2-value	p-value
	f	f		
1.Age of the child in years:				
8-9	20	75	0.02	0.878
9-10	11	44	(df=1)	NS
2.Gender of the child:				
Male	11	62	2.71	0.094
Female	20	57	(df=1)	NS
3. Studying class:				
3rd STD	21	74	0.966	0.617
4th STD	6	33	(df=2)	NS
5th STD	4	12		
4.Birth of the child:				
One	14	54	1.29	0.523
Two	11	32	(df=2)	NS
Three and above	6	33		
5. Source of information:				
Health Professional	0	4	2.321	0.128
Family members	1	6	(df=3)	NS
Electronics media	0	3		
Any other	1	2		
No	29	104		
1.Education level of father:				
Profession	2	14	2.48	0.871
Graduate	2	11	(df=6)	NS
Intermediate	5	15		
High school	10	27		
Middle school	4	20		
Primary school	3	15		
Illiterate	5	17		

2.Education level of mother:				
Profession	2	2	4.01	0.675
Graduate	1	8	(df=6)	NS
Intermediate	3	13		
High school	10	32		
Middle school	5	23		
Primary school	2	15		
Illiterate	8	26		
3.Occupation of father:				
Profession	3	9	4.09	0.664
Semi profession	2	13	(df=6)	NS
Clerical	0	2		
Skilled worker	6	20		
Semi-skilled worker	7	36		
Unskilled worker	11	26		
Unemployed	2	13		
4.. Occupation of mother:				
Profession	2	4	2.94	0.709
Semi profession	2	10	(df=5)	NS
Clerical	0	0		
Skilled worker	4	8		
Semi-skilled worker	1	8		
Unskilled worker	8	40		
Unemployed	14	49		
5. Type of family:				
Nuclear	16	64	0.072	0.964
Joint	13	45	(df=2)	NS
Extended	2	10		

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

The above table showed that the calculated chi square and p value of selected demographic variable's such as age, (χ2- 0.02, p=0.878,) gender (χ2- 2.71, p=0.094), studying class (χ2- 0.966, p=0.617), birth order (χ2- 1.29, p=0.523), previous information (χ2- 0.926, p=0.336), source of information (χ2-5.34, p=0.148), education of father (χ2- 2.48, p=0.871), education of mother (χ2-4.01, p=0.675), occupation of father (χ2-4.09, p= 0.664), occupation of mother (χ2- 2.94, p=0.709), type of family (χ2- 0.072, p=0.964) were more than p <0.05 level of significance. Hence the started null hypotheses was accepted. There was no significant association between pre-test l knowledge scores of game-based group of school children with their selected demographic variable at 0.05 level of significance.

Table 4.4.2: Analysis of Chi-square test between knowledge score of conventional group School children and parents and selected demographic variable. N=150

Demographic variables	Inadequate	Moderate	Adequate		
	F	f	f	χ2-value	p-value
1.Age of the child in years:					
8-9	9	66	0	2.59	0.273
9-10	6	66	2	(df=2)	NS
2.Gender of the child:					
Male	7	58	0	1.60	0.447
Female	8	74	2	(df=1)	NS
3. Studying class:					
3rd STD	7	42	0	4.88	0.300
4th STD	5	49	2	(df=4)	NS
5th STD	3	41	0		
4.Birth of the child:					
One	5	50	1	0.876	0.928
Two	7	52	1	(df=4)	NS
Three and above	3	30	0		
5. Source of information:					
Health Professional					
Family members	0	8	1		
Electronics media	1	5	0	5.044	0.0247
Any other	1	3	0	(df=6)	NS
No	0	3	1		
	13	113	2		
1.Education level of father:					
Profession	2	10	0		
Graduate	2	14	1	13.34	0.345
Intermediate	3	25	0	(df=12)	NS
High school	6	42	0		
Middle school	1	15	0		
Primary school	0	8	1		
Illiterate	1	18	0		
2.Education level of mother:					
Profession	0	2	0		

Graduate	2	3	0		
Intermediate	1	6	0	11.11	0.519
High school	2	16	1	(df=12)	NS
Middle school	3	46	0		
Primary school	5	31	1		
Illiterate	2	28	0		
3.Occupation of father:					
Profession					
Semi profession	0	8	0		
Clerical	3	17	0	12.62	0.397
Skilled worker	1	2	0	(df=12)	NS
Semi-skilled worker	1	28	1		
Unskilled worker	4	33	0		
Unemployed	3	38	1		
	3	6	0		
4.. Occupation of mother:					
Profession					
Semi profession	0	5	0		
Skilled worker	1	8	0	6.52	0.769
Semi-skilled worker	0	9	0	(df=10)	NS
Unskilled worker	2	11	1		
Unemployed	5	40	0		
	7	59	1		
5. Type of family:					
Nuclear	8	68	0	5.01	0.286
Joint	4	37	2	(df=4)	NS
Extended	3	27	0		

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

The above table showed that the calculated chi square and p value of selected demographic variables of conventional group children such as age, (χ2- 2.59, p=0.273), gender (χ2- 1.60, p=0.447), studying class (χ2- 4.88, p=0.300), birth order (χ2- 0.876, p=0.928), previous information (χ2- 0.345, p=0.842), source of information (χ2-7.89, p=0.246), education of father (χ2- 213.34, p=0.345), education of mother (χ2-11.11, p=0.519), occupation of father (χ2- 12.62, p= 0.397), occupation of mother (χ2- 6.52, p=0.769), type of family (χ2- 5.01, p=0.286) were more than p <0.05 level of significance. Hence, the started null hypotheses was accepted. There was no significant association between pre-test knowledge scores of conventional group school children with their selected demographic variable at 0.05 level of significance.

DISCUSSION

In the conventional group, the pre-test level of knowledge of the subject over all knowledge mean is 12.69 with a standard deviation of 2.76, and the mean% is 48.58%, and post-test level of knowledge of the subject over all knowledge mean is 23.56 with a standard deviation of 1.88 and a mean% of 90.6%. Over all knowledge, the mean difference in pre- and post-tests is 1.12, and the t value is 3.61 with a P value<0.001, which is highly significant at the 0.05 level of significance.

In the game-based group, the pre-test level of knowledge of the subject over all knowledge mean is 11.57 with a standard deviation of 2.65, and the mean% is 44.5%, and post-test level of knowledge of the subject over all knowledge mean is 24.82 with a standard deviation of 1.17 and a mean% of 95.46%. The overall knowledge mean difference in the game-based group pre- and post-test is 1.26, and the t value is 6.97 with a P value of 0.001, which is highly significant at the 0.05 level of significance

CONCLUSION

The present study was conducted **effectiveness of conventional vs game based oral health education on oral health related knowledge among school children in selected schools of DNH**. Based on the findings, school children have poor knowledge regarding the oral health related knowledge. The oral health related knowledge has improved knowledge regarding oral health, brushing, and diet. Proper knowledge of the school children regarding the oral health related knowledge reduces the complication.

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