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Effect of simulation assisted training program (SATP) vs mobile app based training program on first aid (FA) and basic life support (BLS) among undergraduate nursing students of selected universities of Haryana: A pilot study report

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Abstract--The study's basic aim was to assess nursing students' understanding of first aid (FA) and (BLS) procedures and to educate them about FA and BLS by doing comparative study to evaluate the effectiveness of Simulation Assisted Training Program (SATP) Vs Mobile App based training Program on First Aid and BLS. A quasi-experimental study to evaluate the effectiveness of the Simulation Assisted Training Program (SATP) Vs Mobile app-based Training Program (MABTP) on First Aid (FA) and (BLS) on knowledge and practice among the undergraduate nursing students in selected Universities of Haryana. In SATP group; the posttests mean score of knowledge was 52.40 ± 12.520 . In MABTP group, the posttests mean score of knowledge was 49.64 ± 8.480 . The mean difference was 2.760. The $t_{48} = .913$, $p = .366$ which indicate that non-significant at 0.05 level. In SATP group; the posttests mean score of practice was 189.96 ± 28.940 . In MABTP group, the posttest mean score of practice was 166.24 ± 38.505 . The mean difference was 23.72. The $t_{48} = 2.462$, $p = .017$ which indicate that significant at 0.05 level. In SATP group; the posttests mean score of knowledge was 72.56 ± 7.665 . In MABTP group, the posttests mean score of knowledge was 57.72 ± 9.298 . The mean difference was 14.840. Here independent t test was applied to find out statistically significant result. The $t_{48} = 6.157$, $p = .001$ which indicate that highly significant at 0.01 level. In SATP group; the posttests mean score of practice was 200.16 ± 24.693 . In MABTP group, the posttests mean score of practice was 169.96 ± 37.776 . The mean difference was 30.20. Here independent

t test was applied to find out statistically significant result. The $t_{48}=3.346$, $p=.002$ which indicate that highly significant at 0.01 level.

Keywords---undergraduate nursing students, SATP, MAPTP, knowledge, practice, evaluation, BLS, first aid.

Introduction

The life of a person is impacted by several aspects including the state of health, education, employment, and socioeconomic level. Among the numerous aspects, the state of health matters a lot.^{1, 2, 3, 4,5,6,7} Prior to the arrival of professional medical help, those who are wounded or unwell are given first aid to help preserve their lives, prevent further damage to their health, or assist in the healing process. Assessments and interventions that can be carried out without the use of medical equipment are included in this category.^{8, 9, 10, 11,12,13,14} Basic first aid training trains students for a broad range of problems. It is necessary to educate students on the primary care of accidents and diseases so that they can be a catalyst for upgrading the health care delivery system.^{15, 16, 17,18,19,20,21,22,23}

Objectives

- To assess and compare the knowledge & practice of under graduate nursing students related to first aid and BLS before and after administration of SATP.
- To compare the knowledge and practice of undergraduate nursing students on First Aid and BLS after the administration of SATP and Mobile app based training program.
- To determine the relationship between the knowledge and practice of undergraduate nursing students before and after administration of SATP and mobile app on first aid and BLS.
- To determine the association of pretest knowledge and pretest practice of undergraduate nursing students using SATP with selected demographic variables.
- To determine the association of pretest knowledge and pretest practice of undergraduate nursing students using MABTP with selected demographic variables.

Hypothesis

- **H1:** There will be a significant difference in the pretest and posttest knowledge scores of undergraduate nursing students after implementation of the SATP on First Aid & BLS.
- **H2:** There will be significant difference in the pretest and posttest practices scores of undergraduate nursing students after implementation of the SATP on First Aid & BLS.
- **H3:** There will be significant difference in the pretest and posttest knowledge scores of undergraduate nursing students after implementation of the mobile app-based training program on First Aid & BLS.

- **H4:** There will be significant difference in the pretest and posttest practice scores of undergraduate nursing students after implementation of the mobile app based training program on First Aid & BLS.
- **H5:** There will be significant difference in the posttest knowledge scores of the undergraduate nursing students receiving SATP Vs MABTP on First Aid & BLS as assessed by the structured knowledge questionnaire.
- **H6:** There will be significant difference in the posttest practice scores of the undergraduate nursing students receiving SATP Vs MABTP as assessed by structured practice checklist
- **H7:** There will be a significant correlation between the pretest and post test knowledge & practice scores regarding first aid and BLS among the undergraduate nursing students.
- **H8:** There will be a significant association of pretest knowledge scores and pretest practice scores with the selected variables among the undergraduate nursing students receiving SATP.
- **H9:** There will be a significant association of pretest knowledge scores and pretest practice scores with the selected variables among the undergraduate nursing students receiving MABTP.

Delimitations

- The study was conducted at selected universities in Haryana.
- The study was performed only in undergraduate nursing students.

Research approach

Quantitative approach

Research design

A Quasi-experimental design

Variables

- Independent Variable: Simulation Assisted Training Program and Mobile app-based training Program.
- Dependent Variable: Knowledge and Practice of nursing students on First Aid and BLS.
- Others variables: Age, gender, name of course, habitat, SES of the family at present staying, interest in emergency care, training of Basic Life Support training of First aid management, maximum posting in clinical area.

Population

Nursing students who were studying in nursing colleges of Haryana, recognized by Government of Haryana and approved by Indian Nursing Council.

Sampling technique

Purposive sampling technique

Sample and sample size

The nursing students who are studying in Maharaja Agrasen Nursing College. Total sample size is three hundred (300). One hundred fifty (150) sample in SATP & One hundred fifty (150) in MABTP.

Description tool

- Tool: Information data sheet of nursing students
- Tool II: Self-structured knowledge questionnaire.
- Tool III: Self-structured practice checklist.

Reliability of tool

- Self-Structured knowledge questionnaire($r=.880$)
- Self-Structured practice checklist($r=.975$)

Pilot study

A total of 50 subjects were enrolled using by purposive sampling technique. Pretest was performed through self-structured knowledge questionnaire and self structure practice checklist on Day 1st. Then intervention was given on Day 2nd, 3rd, 4th, 5th and 6th for 5hrs/day, on 30days completion from the last day of the intervention i.e; (Day 6) posttest I was taken on(36th day & 37th day) and on 60 days completion from the last day of the intervention i.e;(Day 6) posttest II was taken on (66th day & 67th day) using same research tools. The mini study was feasible and did not face any problem during study.

Ethical consideration

- Ethical permission was obtained.
- Anonymity and confidentiality of subjects was maintained.
- Informed consent was obtained from the subjects.

Data analysis and interpretation

The data analysis was done according to study objectives.

Table 1

Demographic Profile of nursing students in selected Nursing Colleges of Haryana

N=50

S. No.	Variables	SATP(n=25)		MABTP(n=25)		χ^2 value	df	P value
		f	%	f	%			
1.	Age(years)							

	≤19	11	44.0	5	20.0	6.799	2	.029*
	20-22	6	24.0	15	60.0			
	≥23	8	32.0	5	20.0			
2.	Gender							
	Male	3	12.0	4	16.0	.166	1	.684 ^{NS}
	Female	22	88.0	21	84.0			
3.	Name of Course							
	B.Sc.N.4 th year	8	32.0	1	4.0	7.778	3	.051 ^{NS}
	B.Sc.N.3 rd year	7	28.0	14	56.0			
	B.Sc.N.2 nd year	5	20.0	5	20.0			
	B.Sc.N.1 st year	5	20.0	5	20.0			
4.	Habitat							
	Rural	19	76.0	17	68.0	.397	1	.529 ^{NS}
	Urban	6	24.0	8	32.0			
5.	Educational status of father							
	Informal	7	28.0	5	20.0	2.474	4	.683 ^{NS}
	Up to Middle	5	20.0	6	24.0			
	Secondary	9	36.0	7	28.0			
	Senior secondary	3	12.0	3	12.0			
	Graduation or above	1	4.0	4	16.0			
6.	Education status of mother							
	Informal	11	44.0	7	28.0	1.575	4	.817 ^{NS}
	Up to Middle	4	16.0	4	16.0			
	Secondary	6	24.0	8	32.0			
	Senior secondary	2	8.0	3	12.0			
	Graduation or above	2	8.0	3	12.0			
7.	Occupation of father							
	Govt. job	2	8.0	4	16.0	1.699	3	.656 ^{NS}
	Pvt. Job	9	36.0	8	32.0			
	Farmers	11	44.0	8	32.0			
	Others	3	12.0	5	20.0			
8.	Occupation of mother							
	Housewife	17	68.0	21	84.0	7.088	3	.064 ^{NS}
	Govt.job	3	12.0	0	0.0			
	Pvt.Job	3	12.0	0	0.0			
	Others	2	8.0	4	16.0			
9.	Family income (Rs./month)							
	<20000	4	16.0	8	32.0	1.824	3	.610 ^{NS}
	20000-30000	8	32.0	7	28.0			
	31000-40000	7	28.0	5	20.0			
	>40000	6	24.0	5	20.0			

NB: SATP= Simulation Assisted Training Program, MABTP= Mobile app-based Training Program, df= degree of freedom, NS=non-significant,*=Significantat5%,

Table 2
Information Profile of nursing students in selected Nursing Colleges of Haryana

N=50

S. No.	Variables	SATP(n=25)		MABTP(n=25)		χ^2 value	df	P value
		f	%	f	%			
1.	Source of information							
	Internet	4	16.0	0	0.0	7.030	3	.067 ^{NS}
	Seminar/conference/lecture	16	64.0	17	68.0			
	Magazine/Journal	0	0.0	3	12.0			
	Health professional	5	20.0	5	20.0			
2.	At present staying							
	Hostel	16	64.0	16	64.0	2.104	2	.353 ^{NS}
	Paying Guest(PG)	7	28.0	4	16.0			
	Own house	2	8.0	5	20.0			
3.	Interest in emergency care							
	Yes	16	64.0	18	72.0	.368	1	.544 ^{NS}
	No	9	36.0	7	28.0			
4.	Completed training in BLS							
	Yes	5	20	5	20	.000	1	1.00 ^{NS}
	No	20	80	20	80			
5.	Completed training in First aid management							
	Yes	3	12.0	5	20.0	.595	1	.702 ^{NS}
	No	22	88.0	20	80.0			
6.	Posted in clinical area							
	Emergency	10	40.0	11	44.0	.159	3	.984 ^{NS}
	ICU	5	20.0	5	20.0			
	Medicine Ward	5	20.0	4	16.0			
	Surgery Ward	5	20.0	5	20.0			

NB: SATP= Simulation Assisted Training Program, MABTP= Mobile app-based Training Program, df=degree of freedom, NS=non-significant, *=Significant at 5%,

Table 3
Knowledge level of nursing students related to first aid and BLS before administration of SATP and MABTP

N=50

S.No.	Level of Knowledge	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Good	6	24.0	7	28.0
2.	Average	19	76.0	18	72.0
	Mean SD	44.32±7.793		159.36±44.439	

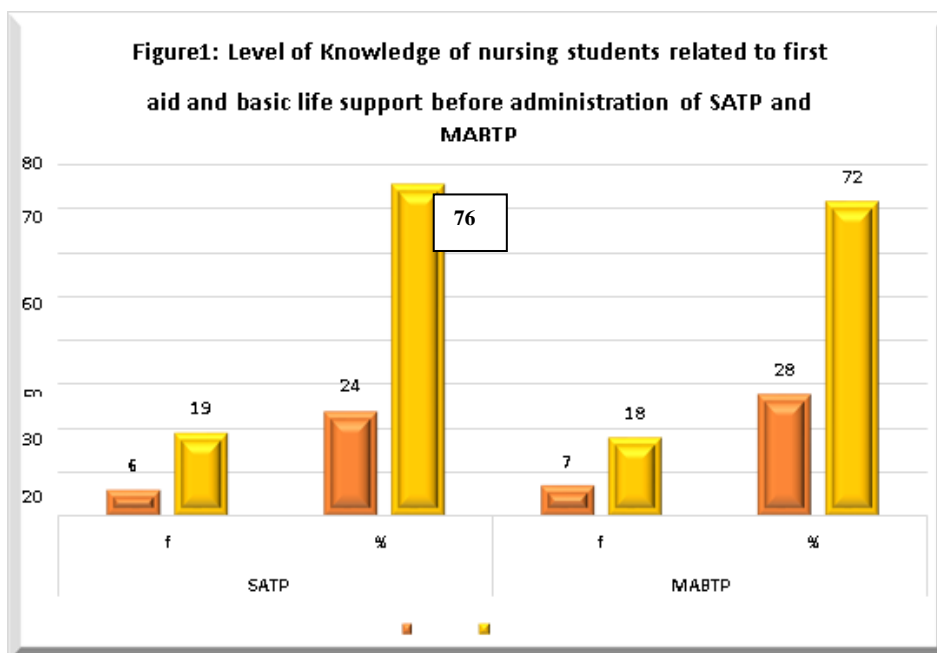


Table 4
Practice Level of nursing students related to first aid and BLS before administration of SATP and MABTP

N=50

S.No.	Level of Knowledge	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Excellent	6	24.0	6	24.0
2.	Good	14	56.0	15	60.0
3.	Average	5	20.0	4	16.0
	Mean SD	44.72±8.049		159.52±40.360	

Table 5
Knowledge Level of nursing students related to first aid and BLS after administration of SATP and MABTP.(Posttest-I)

N=50

S.No.	Level of Knowledge (36 th & 37 th Day)	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Good	12	48.0	12	48.0
2.	Average	13	52.0	13	52.0
	Mean SD	52.40±12.520		49.64±8.480	

Table 6
Level of Practice of nursing students related to first aid and basic life support after administration of SATP and MABTP.(Posttest-I)

N=50

S.No.	Level of Practice (36 th &37 th Day)	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Excellent	13	52.0	9	36.0
2.	Good	12	48.0	13	52.0
3	Average	-	-	3	12.0
	Mean SD	189.96±28.940		166.24±38.505	

Table 7
Level of Knowledge of nursing students related to first aid and basic life support after administration of SATP and MABTP.(Posttest-II)

N=50

S.No.	Level of Knowledge (66 th &67 th Day)	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Good	5	20.0	20	80.0
2.	Excellent	20	80.0	5	20.0
	Mean SD	72.56±7.665		57.72±9.298	

Table 8
Level of Practice of nursing students related to first aid and basic life support after administration of SATP and MABTP.(PosttestII)

N=50

S.No.	Level of Practice (66 th &67 th Day)	SATP (n=25)		MABTP (n=25)	
		f	%	f	%
1.	Excellent	14	56.0	10	40.0
2.	Good	11	44.0	13	52.0
3	Average	-	-	2	8.0
	Mean SD	4.939±24.693		169.96±37.776	

Table 9
Comparison of the knowledge among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app-based training program

N=50

Knowledge score	SATP (n=25)		MABTP (n=25)		MD	T value	df	P value
	Mean	SD	Mean	SD				
Posttest-I (36 th &37 th Day)	52.40	12.520	49.64	8.480	2.760	.913	48	.366 ^{NS}

Table 9 illustrate Comparison of the knowledge among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app-based training program. In SATP group; the posttests mean score of knowledge was 52.40 ± 12.520 . In MABTP group, the posttests mean score of knowledge was 49.64 ± 8.480 . The mean difference was 2.760. Here independent t test was applied to find out statistically significant result. That $t_{48} = .913, p = .366$ which indicate that non-significant at 0.05 level.

Table 10

Comparison of the practice among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app based training program

N=50

Practice	SATP (n=25)		MABTP (n=25)		MD	tvalue	df	P value
	Mean	SD	Mean	SD				
Posttest-I (36 th & 37 th Day)	189.96	28.940	166.24	38.505	23.720	2.462	48	.017

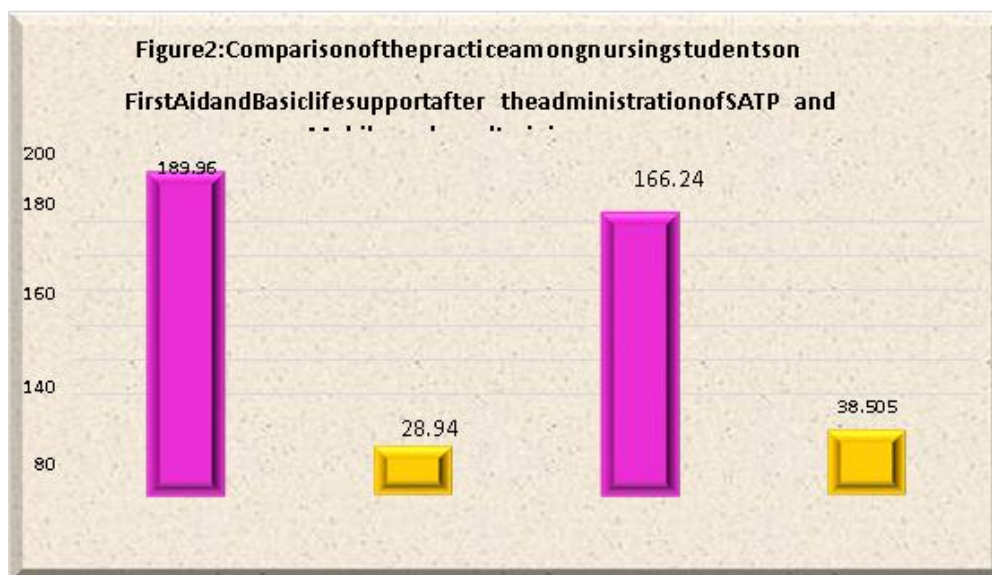


Table 10 and figure 2 illustrate Comparison of the practice score among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app-based training program. In SATP group; the posttests mean score of practice was 189.96 ± 28.940 . In MABTP group, the posttest mean score of practice was 166.24 ± 38.505 . The mean difference was 23.72. Here independent t-test was applied to find out statistically significant result. The $t_{48} = 2.462, p = .017$ which indicate that significant at 0.05 level.

Table 11

Comparison of the knowledge among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app based training program

N=50

Knowledge score	SATP (n=25)		MABTP (n=25)		MD	tvalue	df	P value
	Mean	SD	Mean	SD				
Posttest-II (66 th & 67 th Day)	72.56	7.665	57.72	9.298	14.840	6.157	48	.001*

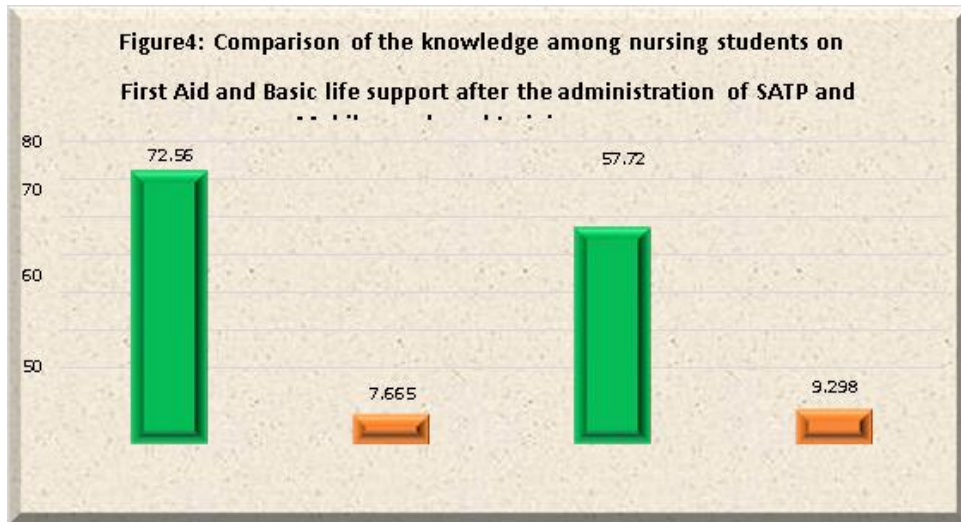


Table 11 and figure 4 illustrate Comparison of the knowledge score among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app-based training program. In SATP group; the posttests mean score of knowledge was 72.56 ± 7.665 . In MABTP group, the posttests mean score of knowledge was 57.72 ± 9.298 . The mean difference was 14.840. Here independent t-test was applied to find out statistically significant result. The $t_{48} = 6.157$, $p = .001$ which indicate that highly significant at 0.01 level.

Table 12

Comparison of the practice among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app based training program

N=50

Practice	SATP (n=25)		MABTP (n=25)		MD	tvalue	df	P value
	Mean	SD	Mean	SD				
Posttest-II (66 th & 67 th Day)	200.16	24.693	169.96	37.776	30.200	3.346	48	.002

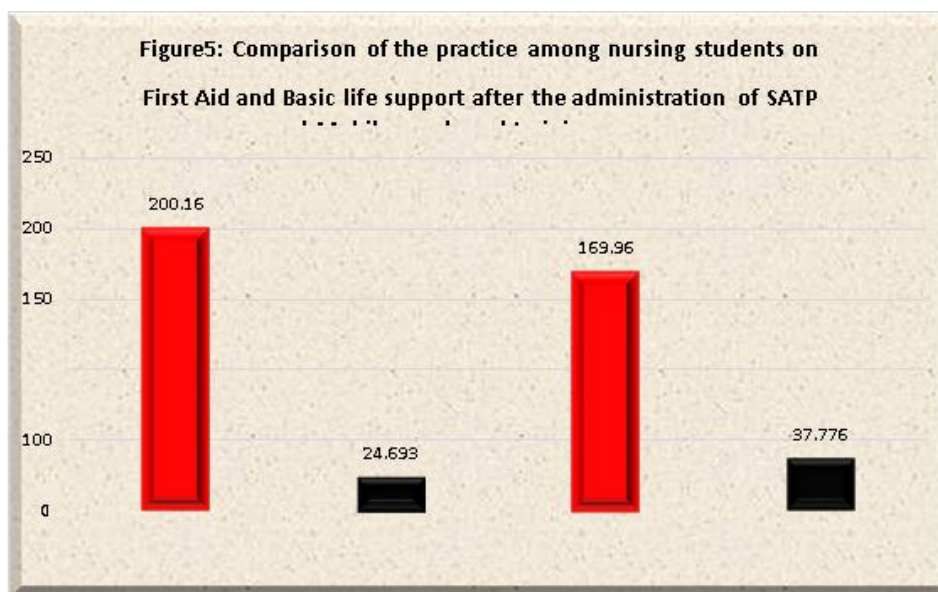


Table 12 and figure 5 illustrate Comparison of the practice score among nursing students on First Aid and Basic life support after the administration of SATP and Mobile app-based training program. In SATP group; the posttests mean score of practice was 200.16 ± 24.693 . In MABTP group, the posttest mean score of practice was 169.96 ± 37.776 . The mean difference was 30.20. Here independent t test was applied to find out statistically significant result. The $t_{48} = 3.346, p = .002$ which indicate that highly significant at 0.01 level.

Table 13

Association between pretest knowledge in SATP group with their socio-demographic variables

N=50

S. No.	Variables	Level of Knowledge		χ^2 value	df	Pvalue
		Good	Average			
1.	Age(years)					
	≤19	2	9	.495	2	.843 ^{NS}
	20-22	2	4			
	≥23	2	6			
2.	Gender					
	Male	2	1	3.402	1	.133 ^{NS}
	Female	4	18			
3.	Name of Course					
	GNM	1	7	1.406	3	.751 ^{NS}
	B.Sc.N.	2	5			
	Post Basic B.Sc.N	2	3			
	M.Sc.N.	1	4			
4.	Habitat					
	Rural	4	15	.377	1	.606 ^{NS}

	Urban	2	4			
5.	Educational status of father					
	Informal	1	6	1.295	4	.936 ^{NS}
	Up to Middle	1	4			
	Secondary	3	6			
	Senior secondary	1	2			
	Graduation or above	0	1			
6.	Education status of mother					
	Informal	3	8	1.616	4	.944 ^{NS}
	Up to Middle	1	3			
	Secondary	1	5			
	Senior secondary	0	2			
	Graduation or above	1	1			
7.	Occupation of father					
	Govt.job	0	2	1.409	3	.899 ^{NS}
	Pvt.job	3	6			
	Farmers	2	9			
	Others	1	2			
8.	Occupation of mother					
	Housewife	6	11	3.715	3	.508 ^{NS}
	Govt.job	0	3			
	Pvt.job	0	3			
	Others	0	2			
9.	Family income (Rs./month)					
	<20000	2	2	3.387	3	.476 ^{NS}
	20000-30000	2	6			
	31000-40000	0	7			
	>40000	2	4			

NB: χ^2 =Chi-square, df=degree of freedom, NS= non-significant, *=Significant at 0.05 level

Table 14
Association between pretest knowledge in MABTP group with their socio-demographic variables

N=50

S. No.	Variables	Level of Knowledge		χ^2 value	df	Pvalue
		Good	Average			
1.	Age(years)					
	≤19	2	3	2.513	2	.465 ^{NS}
	20-22	5	10			
	≥23	0	5			
2.	Gender					
	Male	1	3	.021	1	.884 ^{NS}
	Female	6	15			
3.	Name of Course					
	GNM	0	1	3.104	3	.560 ^{NS}
	B.Sc.N.	5	9			

	Post Basic B.Sc.N	2	3			
	M.Sc.N.	0	5			
4.	Habitat					
	Rural	3	14	2.824	1	.156 ^{NS}
	Urban	4	4			
5.	Educational status of father					
	Informal	2	3	2.690	4	.746 ^{NS}
	Up to Middle	1	5			
	Secondary	3	4			
	Senior secondary	0	3			
	Graduation or above	1	3			
6.	Education status of mother					
	Informal	2	5	6.960	4	.135 ^{NS}
	Up to Middle	0	4			
	Secondary	1	7			
	Senior secondary	2	1			
	Graduation or above	2	1			
7.	Occupation of father					
	Govt.job	2	2	3.299	3	.358 ^{NS}
	Pvt.job	3	5			
	Farmers	2	6			
	Others	0	5			
8.	Occupation of mother					
	Housewife	6	15	.021	1	.884 ^{NS}
	Others	1	3			
9.	Family income (Rs./month)					
	<20000	2	6	3.387	3	.476 ^{NS}
	20000-30000	1	6			
	31000-40000	1	4			
	>40000	3	2			

NB: χ^2 =Chi-square, df=degree of freedom, NS= non-significant, *=Significant at 0.05 level

Table 15
Association between pretest Practice in SATP group with their socio-demographic variables

N=50

S. No.	Variables	Level of Practice			χ^2 value	df	Pvalue
		Excellent	Good	Average			
1.	Age(years)						
	≤19	2	7	2	.732	4	.972 ^{NS}
	20-22	2	3	1			
	≥23	2	4	2			
2.	Gender						
	Male	0	2	1	1.190	2	.551 ^{NS}
	Female	6	12	4			
3.	Name of Course						

	GNM	3	3	2	6.904	6	.359 ^{NS}
	B.Sc.N.	0	6	1			
	Post Basic B.Sc.N	1	2	2			
	M.Sc.N.	2	3	0			
4.	Habitat						
	Rural	5	13	1	10.954	2	.006*
	Urban	1	1	4			
5.	Educational status of father						
	Informal	1	4	2	2.886	8	.979 ^{NS}
	Up to Middle	2	2	1			
	Secondary	2	5	2			
	Senior secondary	1	2	0			
	Graduation or above	0	1	0			
6.	Education status of mother						
	Informal	3	8	0	11.011	8	.085 ^{NS}
	Up to Middle	0	3	1			
	Secondary	1	2	3			
	Senior secondary	1	1	0			
	Graduation or above	1	0	1			
7.	Occupation of father						
	Govt.job	1	0	1	10.688	6	.060 ^{NS}
	Pvt.job	1	6	2			
	Farmers	4	7	0			
	Others	0	1	2			
8.	Occupation of mother						
	Housewife	2	11	4	12.920	6	.049*
	Govt.job	3	0	0			
	Pvt.job	0	2	1			
	Others	1	1	0			
9.	Family income (Rs./month)						
	<20000	0	3	1	2.975	6	.896 ^{NS}
	20000-30000	3	4	1			
	31000-40000	2	3	2			
	>40000	1	4	1			

NB: χ^2 =Chi-square, df=degree of freedom, NS=non-significant, *=Significant at 0.05 level

Table 16
Association between pretest Practice in MABTP group with their socio demographic variables

N=50

S. No.	Variables	Level of Practice			χ^2 value	df	Pvalue
		Excellent	Good	Average			
1.	Age(years)						
	≤19	3	2	0	10.444	4	.024*
	20-22	1	12	2			
	≥23	2	1	2			
2.	Gender						

	Male	2	1	1	2.555	2	.209 ^{NS}
	Female	4	14	3			
3.	Name of Course						
	GNM	0	1	0	5.607	6	.489 ^{NS}
	B.Sc.N.	3	9	2			
	Post BasicB.Sc.N	1	4	0			
	M.Sc.N.	2	1	2			
4.	Habitat						
	Rural	4	10	3	.107	2	.948 ^{NS}
	Urban	2	5	1			
5.	Educational status of father						
	Informal	1	3	1	9.617	8	.273 ^{NS}
	Up to Middle	3	3	0			
	Secondary	0	6	1			
	Senior secondary	1	2	0			
	Graduation or above	1	1	2			
6.	Education status of mother						
	Informal	3	3	1	6.553	8	.666 ^{NS}
	Up to Middle	0	4	0			
	Secondary	1	5	2			
	Senior secondary	1	2	0			
	Graduation or above	1	1	1			
7.	Occupation of father						
	Govt.job	0	4	0	7.677	6	.337 ^{NS}
	Pvt.job	2	5	1			
	Farmers	1	5	2			
	Others	3	1	1			
8.	Occupation of mother						
	Housewife	6	13	2	4.663	2	.138 ^{NS}
	Others	0	2	2			
9.	Family income (Rs./month)						
	<20000	3	4	1	1.409	6	.990 ^{NS}
	20000-30000	1	5	1			
	31000-40000	1	3	1			
	>40000	1	3	1			

NB: $\chi^2 = \text{Chi-square}$, $df = \text{degree of freedom}$, NS = non-significant, * = Significant at 0.05 level

Conclusion

The study has revealed that a repeated posttest activity on FA and BLS at a frequent interval of time has retained the knowledge and practice as well. Based on the major findings the interpretation was Simulation Assisted Training Program was more effective than Mobile based App Training program.

Conflicts of interest

The author declares that they have no conflicts of interest

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