Relative Retentivity of Knowledge in Fish Processing by Fisherwomen

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Retention of knowledge in the preparation of fish pickle, fish wafers and fish soup powder for an experimental group of 20 fisherwomen selected from three fishing villages was studied. The knowledge retention immediately after exposure and also at intervals of 15 days and 30 days after exposure differed significantly.

The effectiveness of any extension effort is to be judged in terms of its capabilities to transfer the instructional content in its fullest measure to the receipient to absorb the same without any loss and retain the same for a longer period by the receipient.

Marks (1955) reported that most people retained 10 to 15 percent of what they had heard, 30 to 35 per cent of what they had seen, 50 per cent or more of what they had seen and heard and upto 90 per cent by participating with the involvement of all senses. Baskaran (1968) reported that young and middle aged farmers retained slightly more knowledge as compared to the older groups. In respect of education, those who had higher level of education had shown a better response to retention of knowledge.

Materials and Methods

An experimental group of 20 fisherwomen was constituted from three fishing villages, Azheekal, Fort Cochin and Kannamaly in Ernakulam District, Kerala. The group was exposed to three messages, namely, preparation of fish pickles, fish wafers and fish soup powder. Their knowledge retention was measured immediately, 15 and 30 days after exposure.

Knowledge was measured with the help of well structured knowledge check list. Knowledge check list had 12 questions with multiple choice answers for all the three messages. One score was given for each correct answer. So the individual who had given correct answers for all questions could get 12 scores. As the experimental group had no knowledge regarding the fish processing technology before exposure, their knowledge at the pre-exposure stage was considered as zero.

The independent variables selected for the study were age, educational status, employment status of the family, annual income and size of the family.

Knowledge retention, to the amount of information recalled by the individual, was measured as follows:

$$\text{Extent of knowledge retention} = \frac{\text{Knowledge score obtained by the individual}}{\text{Total knowledge score}} \times 100$$

Statistical techniques used

The changes in knowledge at three different stages were analysed using the Mcnemar test for the significance of changes (Siegal, 1956). For testing the significance, a four fold Table was constructed as follows:

		After	
		—	+
Before	+	A	B
	—	C	D

The chi-square value for the above Table was calculated using the following formula

$$\chi^2 = \frac{[(A-D)-1_2]}{A-D} \quad \text{with} \quad df=1$$

The analysis of variance was also worked out.

Results and Discussion

Knowledge change in fish processing technology immediately after exposure

The Menemar test for the significance of changes was made to find out the change occurred in the knowledge immediately after exposure.

		Immediately after exposure	
		—	+
Before exposire	+	0	0
	—	0	20

$X^2 = 18.05^{**}$ **significant at 1% level

The calculated chi-square value was significant showing that changes occurred in the knowledge of fish processing technology by the experimental group immediately after the exposure. From the four fold Table it could be seen that knowledge change occurred in the positive direction. It means that all the members of the experimental groups acquired the knowledge immediately after the exposure. As this is the starting point the extent of knowledge retention is considered as 100%.

Knowledge change in fish processing technology at an interval of 15 days after exposure

		15th day after exposure	
		—	+
Immediately after exposure	+	8	5
	—	7	0

$X^2 = 6.125^{*}$ * significant at 5% level

The calculated chi-square value was significant showing that there was a significant change in the knowledge level of fish processing technology at an interval of 15 days after exposure. From the four fold Table it could be seen that the changes had occurred in the negative direction. Here 40 per cent of the fisherwomen showed knowledge reduction cent from the point of was 13.75 per knowledge reduction immediately after exposure to 15th day after exposure.

Knowledge change in fish processing technology during the interval from 15th to 30th day after the exposure

		30th day after exposure	
		—	+
15th day after exposure	+	10	5
	—	5	0

$X^2 = 8.1^{**}$ **significant at 1% level

Here also the chi-square value was significant which showed that the knowledge change had occurred from 15th day to 30th day after the exposure. 50 per cent of the fisherwomen showed knowledge reduction

Knowledge change in fish processing technology at an interval of one month after exposure

		30th day after exposure	
		—	+
Immediately after exposure	+	11	5
	—	4	0

$X^2 = 9.1^{**}$ ** significant at 1% level

The significant chi-square value shows that there was a significant change from immediate exposure to 30th day of exposure. Here 55 per cent of fisherwomen showed knowledge reduction in fish processing technology.

Relative reduction of knowledge in fish processing technology

Analysis of variance technique was employed to find out the difference in knowledge reduction from immediately after exposure to 15th day after exposure and from 15th day after exposure to 30th day after exposure.

Table 1. *Analysis of variance*

Source	Df	SS	MSS	F
Knowledge reduction	1	2.025	2.025	9.6797**
Error	38	7.950	0.2092	
Total	39	9.975		

** significant at 1% level

The significant value of 'F' (Table 1) shows that the knowledge reduction from immediately after exposure to 15th day after exposure and from 15th day after exposure to 30th day after exposure significantly differed.

Mean values for knowledge

The mean values from Table 2 show that the knowledge reduction was more from immediately after exposure to 15th day after exposure (M2) than from 15th day after exposure to 30th day after exposure (M1).

Table 2. *Mean values for knowledge*

Intervals	Mean values
Immediately after exposure to 15th day after exposure (M2)	1.65
From 15th day after exposure to 30th day after exposure (M1)	1.35

The Mcnemar test for the significance of changes was worked out to find the changes in the knowledge reduction.

	From 15th day after exposure to 30th day after exposure		$X^2 = 4.5^*$
Immediately after exposure			*significant at 5% level
15th day after exposure	+	—	+
+	7		2
—	10		1

The significant value of chi-square showed that there was a significant change in the knowledge reduction during the two intervals. Here 35 per cent of fisherwomen showed knowledge reduction.

The extent of knowledge reduction by fisherwomen

The extent of knowledge reduction by fisherwomen immediately, at 15th day and at 30th day after exposure is presented in Table 3.

Table 3. *The extent of knowledge reduction by fisherwomen*

Intervals	Extent of knowledge reduction (percentage)
Immediately after exposure	00.00
15th day after exposure	13.75
30th day after exposure	25.00
From 15th day after exposure to 30th day after exposure	11.25

From Table 3 it could be seen that the knowledge reduction was maximum (25 per cent) at 30th day after exposure.

Relative retention of knowledge in fish processing technology immediately, at 15th and 30th day after exposure

Analysis of variance technique was employed to find out the significant difference in knowledge retention in fish processing technology immediately, 15th and 30th day after exposure (Table 4).

Table 4. *Analysis of variance*

Source	DF	SS	MSS	F
Knowledge	2	65.7	32.85	12.06**
Error	57	155.3	2.72	
Total	59	221.0		

** significant at 1% level

From Table 4 it could be seen that the knowledge retention significantly differed among themselves.

Table 5. *Mean values for the knowledge retention immediately, 15th and 30th day after exposure*

Intervals	Mean values	Critical difference
Immediately after exposure (M3)	12.00	
15th day after exposure (M2)	10.35	1.2033
30th day after exposure (M1)	9.00	

From Table 5 it could be seen that the knowledge retention was maximum immediately after exposure (M3) followed by that at 15th day of exposure (M2) and that at 30th day of exposure (M1). The calculated critical difference 1.2033 confirms the above results.

Socio-economic characteristics of fisherwomen

The mean and standard deviation for the socio-economic variables of the fisherwomen are presented in Table 6.

Table 6. *Mean and standard deviation for the socio-economic variables (n-20)*

Sl. no.	Variables	Mean	Standard deviation
X_1	Age	23.45	5.58
X_2	Education	2.90	0.55
X_3	Size of the family	6.65	2.28
X_4	Employment status of the family	2.65	0.85
X_5	Annual income	1467.00	565.69
Y_1	Knowledge retention	10.53	1.58
Y_2	Knowledge reduction	2.55	0.76

Table 6 shows that average age of fisherwomen in the experimental group was 23, had education on the average up to high school level and the size of the fisherwomen family on the average was 6–7 members. Two to three persons were employed in each fisherwomen family. The average annual income of the fisherwomen family was Rs. 1500/-.

Matrix of correlation for the selected socio-economic variables

The matrix of correlation was worked out for the socio-economic variables selected and the same is presented in Table 7.

Table 7. *Matrix of correlation for the selected socio-economic variables*

	X_2	X_3	X_4	$X5_5$
X_1	–0.45*	0.0006 NS	0.23 NS	0.21 NS
X_2		0.013 NS	0.38*	0.34 NS
X_3			0.75**	0.57**
X_4				0.47*

NS = not significant; * significant at 5% level; ** significant at 1% level.

A perusal of Table 7 indicates that age and education showed negative and significant association, whereas education and employment status of the family, size and employment status of the family, size and annual income of the family showed positive and significant relation. From these results it could be inferred that more number of persons were employed in highly educated and larger sized family. It is natural that large family with more persons employed had high annual income.

Correlation of the selected socio-economic variables with knowledge retention and knowledge reduction of the fisherwomen

The correlation co-efficient for the selected socio-economic variables with knowledge retention and knowledge reduction are presented in Table 8.

Table 8. *Correlation co-efficients (n-20)*

Sl. no.	Variables	Knowledge retention (Y_1)	Knowledge reduction (Y_2)
X_1	Age	–0.54**	0.21 NS
X_2	Education	0.65**	0.11 NS
X_3	Size of family	0.11 NS	0.25 NS
X_4	Employment status of the family	0.28 NS	0.34 NS
X_5	Annual income	0.38*	–0.36*

NS = not significant; * significant at 5% level; ** significant at 1% level

From Table 8 it could be seen that the education and annual income showed positive and significant relationship with knowledge retention. The highly educated women retained maximum knowledge when compared to the low educated women. The age had negative and significant relationship with knowledge retention. This shows that the young women retained more knowledge than old women. The income showed negative and significant relationship with knowledge reduction.

The multile regression equation was

$$Y_1 = 9.25 + 0.10\,X_1 + 1.09\,X_2 + 0.24\,X_3 + 0.814\,X_4 + 0.0075\,X_5$$

$$Y_2 = 4.56 + 0.038\,X_1 + 0.119\,X_2 + 0.052\,X_3 - 0.35\,X_4 + 0.00034\,X_5$$

The R^2 calculated for knowledge retention was 0.62 and for knowledge reduction it was 0.25. The five selected socio-economic variables explained 62 per cent of the variation for knowledge retention and 25 per cent of the variation for knowledge reduction.

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