

WHATSAPP: A WORTH MEDIUM OF COMMUNICATION FOR TRANSFER OF TECHNOLOGY TO THE MASSES

ABSTRACT

The study considers to what extent WhatsApp is effective in dissemination of information. The objective of the study was to study the effectiveness of WhatsApp as channel for dissemination of information. The research was conducted on 90 rural women in Ludhiana district of Punjab. To elicit the information, WhatsApp package on 'prevention of anaemia' was prepared and administered. To see the effectiveness of WhatsApp package (information on anaemia) pre testing was done before intervention (WhatsApp package) and after administering the intervention, post testing was done. The WhatsApp package on 'prevention of anaemia' was found to be significantly effective as the level of knowledge before intervention was found to be in medium category but after intervention it increased to high level category.

Keywords: Mobile telephony, anaemia, WhatsApp, information dissemination.

1. Introduction

It is a fact that good nutrition leads to good health, but on the contrary it is little known that the nutrition status of an individual is a mirror of the society itself and a reflection of forces which influence the shape and pattern of the society (Kikuli 2013). India, a third world country by economic profile, has morphed its morbidity profile to that of a first world nation. Lifestyle diseases in India are cropping up increasingly under the scanner making it a ticking time bomb with an alarming rise in diseases (Khanna 2016).

Life style diseases are diseases you get as a result of the way you live. Many of these diseases are related to the social, cultural, religious and ethnic norms of your community and also its economic status. This list includes the deficiency diseases, cardiovascular diseases, diabetes, hypertension, asthma and respiratory diseases as well as cancers (Yadavar 2016). Among various life style diseases, deficiency diseases like anaemia, osteoporosis, scurvy, beri-beri etc. can be prevented and cured with proper knowledge. Taking these deficiency diseases in consideration anaemia is of more concern in the developing countries having high prevalence rate due to dietary iron deficiency. India tops the list of nations with most anaemic women (55%) and children (78.9%) (NHFS 2005).

As mentioned earlier these diseases can be overcome by creating awareness and imparting knowledge so that people may change their lifestyle and improve their eating habits before its too late. To educate masses we need to make use of technology which is widely used by people as a channel. Today being in a digital era and due to the ubiquity of mobile and there has been a rapid increase in adoption and use of mobile technologies in developing country. According to the data released by Telecom regulatory of India, it just crossed one billion mobile phones user (Rai 2016). Since we have good number of mobile user and according to the report published by the IAMAI, 2017 which says

37 that the number of internet users in India has estimated to reach around 420 million by June, 2017
38 (Agarwal 2017). The latest figure indicates that India has more internet users than the population of
39 the US and become the second largest country by the number of internet users after China. Therefore,
40 there is a need to cash the opportunity by using all-pervasive WhatsApp which is not only glanceable
41 but also quick and fast as a channel for information dissemination. This proprietary, cross-platform
42 app uses the Internet to send text messages, images, video, user location and audio media messages.
43 WhatsApp instant messaging is a free application, which is advantageous. A mobile system text
44 messaging allows its user send and receive messages synchronously and asynchronously. The
45 WhatsApp instant messaging system is simplistic, intuitive, and very easy to use (Patil et al
46 2015). Online survey also suggested that WhatsApp is the most used mobile applications among youth
47 for dissemination of messages or information, exchange of images, audio and video files with their
48 friends using WhatsApp on their smartphone (Jisha and Jebakumar 2014). It also impacted farmers
49 which formed their own group “Young Innovative Farmers” where from dissemination of information
50 from crop health to seed procurement, soil health, use of fertilizers and pesticides, helped farmers in
51 Punjab to get immediate advice via WhatsApp group which includes agricultural experts (Singh
52 2015). The observations shows that rural people are using whatsapp to get information which earlier
53 they were deprived of as the channels and methods used to disseminate information to the target
54 population were having various limitations.
55 But there is dearth of research on use of WhatsApp as a channel for dissemination of
56 information/technologies. In a view of this, the present study was conducted to study the effectiveness
57 of WhatsApp as a channel in dissemination of information to prevent anaemia.
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59 2. MATERIALS AND METHODS

60 The study was conducted in Ludhiana district of Punjab. A pre experimental research i.e one group
61 pre-test post-test design was used for the present study. As Indian women is the ultimate health and
62 nutrition care taker for the whole family, hence experiment was performed on women. If we compare
63 rural and urban women, urban women have more mass media exposure while disseminating
64 information and technologies to rural women have been a challenge. Therefore, thirty rural women
65 (between age group 20-40 years) from each of the three villages of Ludhiana block were selected
66 through random sampling technique based on the criteria; willingness to become part of the study,
67 access to smart phone with internet availability, regular users of WhatsApp. Hence the total sample
68 comprised of 90 rural women.

69 The content for WhatsApp package was collected and updated through the reliable literature
70 resources (both online as well as offline). The WhatsApp package was segregated into four parts i.e.
71 general information about anaemia, information about symptoms of anaemia and its ill effects on
72 different body parts, reason of anaemia and prevention of anaemia. To catch the interest of

respondents, the content was put in different delivery modes like text, pictures, charts, video. The pre knowledge and practices used by respondents to prevent anaemia were determined through data collected prior to the intervention. The respondents were then exposed to the selected content and after a period of two months post testing was done to study the improvement in knowledge and practices used by rural women.

For the purpose, questionnaire was formulated which comprised of 3 parts. First part was related to socio personal profile, second part included practices to prevent anaemia and third part included knowledge test which further included alternative responses i.e. true or false. The score assigned were as one for correct response and zero for incorrect. At the end, individual score of each individual was calculated. On the basis of knowledge score, individuals were put into three categories i.e. low (0-12), medium (13-24) and high (25-36) as there were 36 questions and maximum score possible was 36. Adoptions of practices to combat anaemia were measured on 4 point continuum varying from 4 (very frequently) to 1 (rarely).

The items were then submitted to a group of 3 subject matter specialist in Food and Nutrition the item were then duly modified. The text were afterwards experimentally tried out on 15 non sample group based on the result of which item analysis was done using following formulas for item difficulty index and item discrimination index.

$$\text{Difficulty index} = \frac{\text{No. of respondents who gave correct response}}{\text{total no. of respondents}} \times 100$$

$$\text{Discrimination index } D = \frac{U-L}{F}$$

Where D = index of item discriminatory power

U = No. of respondents in the upper group who answer the test item correctly

L = No. of respondents in the lower group who answer the test item correctly

F = No. of respondents in each group

Out of 42 items, 7 items with less than 0.19 discrimination index were discarded while 18 items with discrimination index less than 0.39 were improved while rest with DI of more than 0.40 were considered very good items. Thus over all the test included 36 items.

The difficulty index of 36 selected items was then calculated which ranged from 3.3 (difficult) to 66.6 (easy). So it was inferred that items ranged from being easy to difficult.

3. RESULTS AND DISCUSSION

3.1 Socio-personal characteristics

Table 1 depicts the socio personal characteristics of the respondents. It shows that majority of the respondents were highly educated (38.8% graduate and 34.4% postgraduate). About 63 per cent respondents came from nuclear type of family with medium family size (52.2%). Most of the women (80%) were married and were homemaker (71.1%). About half of the respondents had annual income in medium (48.88%) category followed by low (31.1).

Table 1. Distribution of respondents according to their socio-personal characteristics

Characteristics	Categories/range	Total (90)
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		f (%)
Education	Middle	4(4.4)
	Matric	12(13.3)
	Senior secondary	8(8.88)
	Graduate	35(38.8)
	Post graduate	31(34.4)
Family type	Nuclear	57(63.3)
	Joint	33(36.6)
Family size	Small (up to 4 members)	43(47.7)
	Medium(5 to 8 members)	47(52.2)
	Large(above 8 members)	-
Marital status	Married	72(80)
	Unmarried	16(17.7)
	Divorcee/Widow	2(2.22)
Occupation	Home maker	64(71.1)
	Working	13(14.4)
	Student	13(14.4)
Annual income	Low (4.5-9 lakhs)	28(31.11)
	Medium(9-13.5 lakhs)	44(48.88)
	High(>13.5)	18(20)

109

110 3.2 Comparison of practices adopted by respondents before and after intervention.

111 Although adoption was measured only after two months and significant difference was observed. The
112 reason could be that the practices were very easy and related to their day to day habits. Moreover
113 WhatsApp package was accessible to them all times as they could read or watch the contents
114 according to their need and convenience. The data in Table 2 shows that there was significant change
115 in adoption of practices for combating anaemia after intervention. Practices related to the use of
116 GLV's and maintenance of health & hygiene was frequently practiced before intervention good' ($\bar{x}$
117 =3.20 and 3.0) and also after intervention good' ($\bar{x}$ =3.38 and 3.01) although a slight change in mean
118 score was noticed as shown in Table 2. Consumption of seasonal fruits, citrus foods and cooking iron
119 rich recipe was sometime practiced before ($\bar{x}$ =2.8, 2.05 and 2.8) intervention but afterwards it was
120 frequently practiced with the mean score of 3.3, 2.56 and 2.50. The practice of not having iron
121 inhibitors like tea & coffee after meals, taking varied meal combination was again practiced sometime
122 by respondents before($\bar{x}$ =2.07 and 2.06) intervention but after intervention it changed to frequently
123 practiced($\bar{x}$ =2.56 and 2.96). For the practices concerning preserving of GLV's and timely Hb test it
124 shifted from rarely to sometime practiced. A significant change was observed in practice of cooking
125 food in iron utensils from rarely to frequently. Not much difference was noted in adopting the policy
126 of balanced diet. Overall, we can conclude that there was statistically significant change in adoption
127 of practice where weighted mean score changed from 2.17 WMS to 2.84 WMS. The paired t value
128 ($t_{(11)}=5.46$, $p < 0.05$) was more than table value i.e. 2.06 and hence significant statistically.

129 **Table 2. Distribution of respondents according to their measures adopted to protect themselves**
130 **and their family from anaemia**

Measures	Pretesting	Post testing
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	WMS	WMS
Use of GLV's	3.20	3.38
Cooking in iron utensils	1.48	2.57
Eating seasonal fruits	2.8	3.3
Iron rich recipe	2.02	2.50
By not drinking tea/coffee after meals	2.07	2.56
Taking citrus foods daily	2.05	2.56
Taking care of varied meal combinations	2.06	2.96
Preserving GLV's	1.33	2.11
Timely hemoglobin test	1.01	2.01
Having proper balanced diet	2.86	2.92
Maintaining health and hygiene	3	3.01
Total	2.17	2.84
Paired t value	5.46**	

131 *WMS- Weighted mean score

132 * *Significant at 5 per cent level

133 3.3 Comparison of knowledge of respondents before and after intervention.

134 3.3.1 General knowledge regarding anaemia before and after intervention

135 It is clear from the data presented in Table 3 that for all the statements related to general
136 information about anaemia there was significant change before and after intervention. Overall, at pre-
137 testing stage for almost all the statements, knowledge among respondents on an average was found to
138 be less than 50 per cent, which further increased to almost 90 per cent at post-testing stage.
139 Interestingly, even prior to the intervention majority of women (78.8%) were aware of normal Hb
140 level in women while half of them were aware of normal Hb level for men (55.5%). Shockingly
141 knowledge regarding normal Hb level in children showed drastic stoop (21.1%) prior to intervention
142 but afterwards it increased to 87.7 per cent. On an average 46.11 per cent respondents had general
143 knowledge regarding anaemia which increased to 90.5 per cent after intervention. Overall, the
144 difference in pre and post knowledge was found to be significant statistically as the paired t value was
145 more than tabular value i.e. 2.447 ($t_{(6)} = 13.02$, $p < 0.05$) which shows that WhatsApp package
146 improved their knowledge about anaemia.

147 **Table 3: Distribution of respondents according to the general knowledge about anaemia**

Items	Response (pre-testing)		Response (post-testing)	
	f	%	f	%
Lack of some important nutrient causes anemia	42	46.6	86	95.5
Anaemia is condition where RBC's become deficient of haemoglobin	33	36.6	77	85.5
Hemoglobin plays crucial in transportation of oxygen throughout the body	34	37.7	74	82.2
Normal Hb level in women is more than 12mg/100g	71	78.8	85	94.4
Normal Hb level in men varies from 13-15mg/100g	50	55.5	88	97.7
Normal Hb level of children varies from 11-14mg/100g	19	21.1	79	87.7

Total	249	46.11	489	90.5
Paired t –value	13.02**			

148 **Significant at 5 per cent level

149 3.3.2 Knowledge regarding symptoms of anaemia before and after intervention.

150 Symptoms were studied into two parts; common symptoms of anaemia and its ill effects on
151 different body parts. For almost all the symptoms of anaemia not much difference was seen between
152 pre and post knowledge as good number of respondents were already aware of almost all the common
153 symptoms of anaemia prior to intervention as seen from Table 4. For two symptoms i.e. 'persistence
154 craving for pica' about which merely 5.55 per cent respondents were aware and 'frequent pain in legs
155 and arms' about which only 38.8 per cent were aware of before intervention of the package a
156 significant increase was noticed after intervention as shown in Table 4 As a whole almost 67.03 per
157 cent respondents were already aware of the symptoms of anaemia which increased to 88.8 per cent
158 after intervention and it was found to be statistically significant at 5 per cent level as the tabular value
159 (2.447) is less than paired t value ($t_{(6)} = 10.01$, $p < 0.05$).

Items	Response (pre-testing)		Response (post-testing)	
	f	%	f	%
Feelings of extreme tiredness	88	97.7	89	98.8
A person will have pale appearance and decreased appetite	74	82.2	87	96.6
The person will have shortness of breath	80	88.8	82	91.11
There is a persistence craving for pica	5	5.55	56	62.2
A person feel frequent pain in legs and arms	35	38.8	79	87.7
Anemia affects the capacity to do work	80	88.8	87	91.11
Total	362	67.03	480	88.8
Paired t –value	10.01**			

160 **Significant at 5 per cent level

161 Table 4: Distribution of respondents according to the knowledge about symptoms of anaemia

162 The data depicted in Table 5 reveals the distribution of respondents according to their
163 knowledge about ill effects of anaemia on different body parts. The perusal of data indicates that not
164 even a single respondent was aware that anaemia leads to enlargement of spleen and a very few
165 (4.44%) were aware of anaemia as cause of disturbance in gastrointestinal system followed by a very
166 few respondents i.e. 8.88 per cent who were aware of its adverse effect on blood pressure. But after
167 intervention significant change in knowledge was noticed. As a whole, it can be inferred from the
168 table that there is significant increase in percentage of respondents knowledge from 36.9 per cent to
169 74.02 per cent after intervention which was statistically significant as tabular value is less (2.26) then
170 paired t value ($t_{(8)} = 15.49$, $p < 0.05$) at 5 per cent level of significance

171 Table 5: Distribution of respondents according to the knowledge about ill effects of anaemia on 172 different body parts.

Items	Response (pre-testing)		Response (post-testing)	
	f	%	f	%
It adversely affects the eyes	69	76.6	71	78.8

It has direct affect on the face	70	77.7	81	90
It affects the respiratory system	50	55.5	77	85.5
It weakens the muscular system of the body	30	33.3	72	80
It disturbs the gastrointestinal system	4	4.44	44	48.8
It lowers the blood pressure.	8	8.88	74	82.2
It has adverse affects on heart.	35	38.8	83	92.2
In anaemia spleen gets enlarged	0	0	31	34.4
Total	266	36.9	533	74.0
Paired t –value	15.49**			

173 * **Significant at 5 per cent level

174 3.3.3 Knowledge regarding reasons of anaemia before and after intervention.

175 The data presented in Table 6 reveals a significant change in knowledge regarding reasons of
176 anaemia before and after intervention. At pre-testing stage, only 48.2 per cent of respondents were
177 aware of various reasons regarding anaemia but at post-testing stage it raised to 84.1 per cent. A very
178 few percentage of respondents (4.44%) were aware of ‘iron inhibitors’ as one of the reason of
179 anaemia followed by ‘low iron stores in new born’ (6.66%) further followed by 22 per cent who knew
180 ‘low intake of non-vegetarian diet’ as a cause of anaemia before intervention but after intervention a
181 significant increase was observed. The difference was further analysed using paired ‘t’ ($t_{(7)} = 16.15$, $p <$
182 0.05) test and it was found to be more than tabular value (2.36) which is significant at 5 per cent level
183 of significance.

184 **Table 6: Distribution of respondents according to the knowledge about reasons of anaemia.**

Items	Response (pre-testing)		Response (post-testing)	
	f	%	f	%
Inadequate intake of minerals and vitamins causes anaemia.	49	54.4	68	75.5
Low iron stores in new born	6	6.66	78	86.6
Consumption of iron inhibitors	4	4.44	75	83.3
Low intake of non-vegetarian diet	20	22.2	60	66.6
Illiteracy and poverty is one of the possible reason of anaemia	83	92.2	84	93.3
Casual attitude or lack of knowledge regarding their health.	85	94.4	83	92.2
Women health issues	57	63.33	82	91.1
Total	304	48.2	530	84.1
Paired t –value	16.15**			

185 * **Significant at 5 per cent level

186 3.3.4 Knowledge regarding the prevention of anaemia before and after intervention

187 Table 7 highlights that before intervention majority of the respondents were not much aware
188 of ‘iron content in spices’, as only 6.66 per cent were aware of it, followed by only 10 per cent of the
189 respondents who were aware of nutrients which helps in absorption of iron. A significant majority of
190 the respondents (84.5%) were also not aware of the fact that ‘consumption of iron inhibitors reduces
191 absorption of iron rich foods’ followed by ‘RDA’s for iron rich foods’ about which only 16.6 per cent
192 of the respondents were aware at pre testing stage. A significant increase for all the parameters was
193 seen at post-testing stage. As a whole a significant change was observed in knowledge of respondent

194 (38.64% to 81.23%) after intervention. Statistically paired 't' test indicated ($t_{(9)} = 19.36$, $p < 0.05$) that
 195 it was greater than the tabular value (2.262) and it is significant at 5 per cent level of significance.

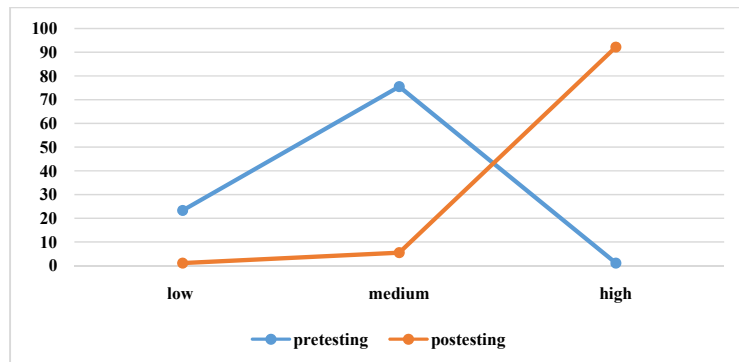
196 **Table 7: Distribution of respondents according to the knowledge about the prevention of**
 197 **anaemia**

Items	Response (pre-testing)		Response (post-testing)	
	f	%	f	%
Anaemia can be prevented by proper diet and supplementations.	87	96.6	89	98.8
Green leafy vegetables have rich iron contents.	39	43.3	88	97.7
Some spices have satisfactory iron content.	6	6.66	63	70
We can have green leafy vegetables throughout the year.	34	37.7	76	84.4
There are different sources of iron other than green leafy vegetables.	41	45.5	81	90
Some nutrients help in absorption of iron.	9	10	60	66.6
Citrus fruits are good sources of Vitamin C	68	75.5	86	95.5
Consumption of inhibitors reduces the absorption of iron.	14	15.5	71	78.8
As per the RDA's one should consume iron rich foods.	15	16.6	44	48.8
Total	313	38.64	658	81.23
Paired t -value	19.36**			

198 **Significant at 5 per cent level

199 3.4 Assessment of Pre and Post knowledge of respondents

200 On the basis of knowledge scores of each respondent, pre and post knowledge was compared
 201 as shown in Figure 1. It shows that before intervention majority of the respondents belonged to
 202 medium knowledge level (76.6%) and 23.3 per cent respondents were in low category, while after
 203 intervention majority of the respondents were shifted to high category of knowledge (92.2%). Overall,
 204 prior to exposure to the selected intervention, all the respondents were placed in the medium score
 205 category, while after exposure to the selected WhatsApp package, maximum number of respondents



206

207 **Fig1. Distribution of respondents according to their level of knowledge before and after**
 208 **intervention.**

209 were placed in higher score category while only 1.1 per cent respondent were having low

210 knowledge. Therefore, it can be concluded that WhatsApp package can be used as a channel for
211 dissemination of information. There are number of reasons for the adoption of WhatsApp as their
212 main communication medium rather than traditional alternatives by people, listed by Church and De
213 Oliveira (2013); these are low cost of application with combination of ability to send an unlimited
214 number of messages, immediacy, the desire to feel a part of the trend since their acquaintances have
215 already adopted the application, the capacity to conduct an on-going conversation with many friends
216 simultaneously, the knitting together of a community of friends or family etc. This mighty App
217 touched every arena as Robinson *et al* (2015) described the first ever outlet created by Eyewitness
218 News in South Africa by using WhatsApp to communicate with its readers. The effectiveness of
219 WhatsApp in communicating formally as well as informally is supported by scholars in this field.
220 Bere (2013) studied the use of WhatsApp in a South African University class and found positive
221 feedback from students and further explained that such cooperation was felt to bridge gaps in
222 knowledge and physical distance. Thota and Divatia (2015) notified WhatsApp as a life-saver tool
223 in critical conditions where they use this magic stick to send clinical images to consultants and
224 back to the sender.

225 Hence, the results of the study also in line with many studies conducted across countries
226 which shows that WhatsApp is an effective, low cost, quick and easy to implement (Wani 2013) and
227 is user friendly adjunct to traditional modes of communication (Martyn 2015) with the potential of
228 facilitating communications, enhancing learning and improving situation whilst preserving the privacy
229 (Nardo et al 2016).

230 **Conclusion**

231 In the current investigation, the knowledge of the respondent was found to be in medium
232 category at pretesting stage but at post testing stage it significantly increased to high category. Also,
233 significant change was observed in the adoption of practices for the prevention of anaemia after
234 intervention of WhatsApp package. Respondents shared that they were satisfied with the practice of
235 using WhatsApp as a media for dissemination of information as they can have the access of the
236 information anytime, anywhere at their own ends. Thus, overall WhatsApp was found to effective
237 media for dissemination of any information instantly. It is recommended that social worker, extension
238 workers can disseminate the knowledge and technology to the masses, living in different areas for its
239 timely dissemination and can be use by the communities to improve their lifestyle and sustainable
240 development.

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