Original Research Article

FoodSwitch: Can a smart phone app help consumers switch to healthier food choices? A Pilot Study.

Sree T. Sucharitha[1], Jarasruthi Muruganantham[2].

Authors:
1. Associate Professor, Department of Community Medicine, 2. 4th year MBBS, Tagore Medical College and Hospital, Rathinamangalam, Melakkottaiyur post, Chennai – 600 127, Tamilnadu.

Corresponding Author:
Dr. Sree T. Sucharitha, Associate Professor, Department of Community Medicine, Tagore Medical College and Hospital, Rathinamangalam, Melakkottaiyur post, Chennai – 600 127, Tamilnadu.
Email: sucharithat2@gmail.com

Abstract

Background: The national burden of diseases determined by diet related life-styles of the population is on the rise in the past two decades. Two third of consumers visiting supermarkets own a smart phone and use of mobile apps is high among educated youth and adults in India. The George Institute of Global Health and Bupa Australia, developed FoodSwitch India app and launched in India, in December 2015 with the aim to support healthier food choices. **Objective:** This study aims to 1. Determine the willingness of the consumers to use FoodSwitch smartphone application to make healthier food choices. **Materials and methods:** This is an experimental-intervention study conducted during May-June 2016 in 10 different supermarkets in the sub urban region of Chennai, of Tamil Nadu. As a pilot study, 50 consumers with smart phones arriving at supermarkets with the intent of purchasing food products were included in the study after obtaining written informed consent. They participated in the study by downloading FoodSwitch app on their smartphones after demonstration by the researchers and used it for their purchases. **Results:** 46% of the study participants are of 18-28 years, 54% are females. 88% are graduates and 28% are professionals, 20% are house-wives. Only 12% of them choose food products using nutritional label. Overwhelming majority of them (98%) are not aware of the app called FoodSwitch. 76% of them feels that the FoodSwitch app is very easy to use.56% expressed willingness to use this app regularly in future. **Conclusion:** This study revealed awareness about FoodSwitch app is low among consumers and only half of them are willing to use regularly hereafter. This is a relatively small sample and hence further studies are required.

Key Words: Diet-related life style, smart phone application, FoodSwitch, nutrition label.

Introduction:

Studies show that food labeling on packages help consumers understand the nutritional content of foods and help them make informed and healthier choices [1, 2]. Earlier studies have evaluated the potential of smart phones, which are a recent advance to transform public health landscape tremendously[3]. Authors claimed that there are 7000 documented cases of smart health apps globally [3, 4]. About two third of consumers visiting supermarkets own a smart phone and use of mobile apps is high among educated youth and adults in India. FoodSwitch, is a free smart phone application which works on Android smartphones and Apple mobile devices that could potentially minimize the ill effects of processed foods by helping the consumers find out what is in the food they are eating, so that they can switch to healthier food choices[5]. It is launched in India, in December 2015, and is an extension of an app already available in several countries including Australia, New Zealand, Britain, China and South Africa. A version of app for USA is in development[5]. FoodSwitch India App was developed by The George Institute of Global Health and Bupa Australia with the aim to support healthier food choices and help prevent diet-related health disorders[5, 6]. There are totally thousand downloads of this FoodSwitch app made by people of India in Google play store. FoodSwitch works by scanning the barcodes of packaged food using smart phone camera and receive immediate, easy to understand nutritional information with a consumer friendly traffic

light type of color coded rating for four key food components (total fat, saturated fat, sugar and salt) along with energy in kilojoules. In the traffic light system red indicates the food is less healthy, amber indicates the food is ok and green is healthier choice. Vegetarian status is displayed by a green side bar and the word "VEGETARIAN" will appear on the side. Then the app also lists out some of the similar food that are healthier alternatives of the food which is scanned. The scanned food items are matched with the database and information is displayed. Nutritional information of the scanned food products comes from independent packed food database for India[5]. The difference between FoodSwitch India and other countries is the health star rating system and the filters[7]. Only classic filters which helps in making overall health choices are present in FoodSwitch India. Other country foods witch app contains separate filters like salt switch, gluten switch, fat switch, energy switch, sugar switch. Shop ethical, shop well, sea food guide are the some of the other food choosing apps and traffic light food tracker, my food intolerance list, the Monosh university low fod map diet are other traffic light coding food apps available. But FoodSwitch India is the only app introduced for choosing healthier food products in India with traffic light coded system which also shows alternative food choices. The national burden of non-communicable diseases (NCDs) is on the rise in the past two decades[8]. Non communicable diseases (including heart disease, stroke, cancer and diabetes) are responsible for 43 million death each year which is almost 80% of all deaths worldwide[9]. A simple change in choosing healthier food products can reduce the incidence of non-communicable diseases. Food products we choose to consume at individual and family level directly influence the epidemic of obesity among children and adults. As India ranks third in the world's most obese countries list[10], interventions targeting the prevention of NCD-related risk factors such as obesity are the need of the hour[11, 12]. The regular use of technology enhanced smart phone applications will empower consumers to make informed decisions on their food consumption behaviors. Real world research though challenging is needed to understand the willingness and use of this recently introduced app and its influence on consumer's food purchasing behavior.

Materials and methods:

Study Design: Experimental-Intervention Study Design. **Study type:** Pilot study. **Study Period:** 1st May 2016 – 30th June 2016 (Two Months). **Study site:** This study was conducted in ten different supermarkets-(TKS Shanmuga provisions, Murugan supermarket, AP Supermarket, VM Supermarket, More supermarket, Jayam supermarket, Sri Krishna supermarket, Heritage fresh supermarket, Bloom gold departmental store and Sri Venkateshwara

supermarket in OMR region which is a sub-urban area of Chennai, of Tamilnadu. **Study Population:** Consumers arriving at supermarkets with the intent of purchasing food products available with nutrition label. **Sample size:** Five consumers shopping at each supermarket (N=10) where included in the study. Totally 50 consumers shopping at the supermarkets where included in the study. **Selection criteria: Inclusion Criteria:** Consumers aged above 18 years, Owning a smart phone either with functional internet connection or Bluetooth connectivity, Shop at supermarket at least once a week, Regular main shopper for the household, able to read and understand English, Willing to participate in the study by downloading FoodSwitch app on their smartphones, Provide written consent. **Exclusion Criteria:** Another family member already enrolled. **Informed consent procedure:** Informed written consent was obtained from the supermarket managers or supermarket incharge before conducting the study. During the study informed written consent was obtained from all the 50 study participants. **Study Area:** Supermarkets situated in a residential upmarket area in a metropolitan city is randomly selected and approached with this study proposal. Management, which is favorable and agrees for the conduction of the study among its consumers in shop premises are included in the study after getting an informed written consent from the manager or the supermarket incharge. As this is a pilot study on smart phone app, which is introduced in India recently, only 50 participants are included as sample size. The consumers shopping at the supermarkets where approached with the study proposal. Consumer at the supermarket who are favorable and volunteering for participating in this study by downloading FoodSwitch app through internet or installing the app through Bluetooth or other sharing apps like SHAREit are included and informed written consent was obtained from them. Participants of the study where directed to install the app in their smart phones. Participants where explained how to use the FoodSwitch app by scanning the barcodes of the chosen food products with the mobile camera. After the food label appeared on the screen they were explained about the traffic light model and alternative healthier food choices shown in the screen .Then the participants were made to try the FoodSwitch app on their own. Later they were administered a questionnaire, which collects information on the socio-demographic profile, and practices of smartphone usage and attitude towards FoodSwitch app. FoodSwitch tells the consumer its health weightage i.e. how high the food is in salt, fat, sugar and kilojoules. It also suggests healthier alternatives in the same food category, thereby comparing the product of one company with the other in the above aspects. As a food item is scanned, FoodSwitch shows more information in the form of a color code, red amber and green about the nutrition in the product. In the 'Traffic Light' labelling mode, color-coded ratings project on the screen if a product is low (green), medium (amber)

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or high (red) for key food components (total fat, saturated fat, sugar and salt). Red is less healthy, amber is ok and green is a healthier choice. This inbuilt feature in the app will provide the consumers with options and empower them to make informed choices regarding purchase of healthier food products. Data collection procedure: After obtaining informed written consent, the content of the questionnaire was explained to the participants. Self-administered questionnaire was given to the participants and data was collected. Ethical consideration and confidentiality: Institutional ethical committee approval was obtained before starting the study. Confidentiality of the study participants is maintained in all phases of the study.

Result:

Study was conducted among fifty consumers shopping at ten different supermarkets which included TKS Shanmuga provisions, Murugan supermarket, AP Supermarket, VM Supermarket, More supermarket, Jayam supermarket, Sri Krishna supermarket, Heritage fresh supermarket, Bloom gold departmental store and Sri Venkateshwara supermarket in sub-urban area of Chennai. Forty six percent of the study participant's fall in the age group of 18-28 years, fifty four percent of them are females and forty six percent where males. Eighty eight percent of them being graduates and above education level. Twenty eight percent of the study population belongs to upper socioeconomic class according to Kuppuswamy's socioeconomic status scale, forty percent study participants are semiprofessionals and twenty eight percent of them are professionals, twenty percent of the study population who are unemployed are house wives. Fifty six percent of the study population always wanted to make healthier food choices and forty percent of the population wanted to make healthier food choices sometimes. Forty two percent of them occasionally have the habit of choosing food products by seeing the calorie value and nutritive value in the label. Nutritive value is first most to be considered in the label by twenty eight percent of the study participants and thirty two percent of them consider price as important part in food label. Majority of them (98%) forty nine members of the study population are not aware of the app called FoodSwitch. Eighteen percent of them said they have used other apps like calorie carb and fat counter, zomato, domino's pizza app, food recipes app and food panda app which are not actual food choosing apps but they are food delivery apps and food recipe apps for choosing their food products. Seventy six percent of them feels that the FoodSwitch app is very easy to use. Thirty percent population of the study wanted other features such as including data about all food products, improvement in auto focus, suggesting more alternative food choices and the study population also wants the app to suggest

Table 1: Profile of the study participants (N=50)

Profile	N (%)	Profile	N (%)
Age:		**Occupation:**	
18-28	23(46)	Profession	14(28)
29-38	16(32)	Semi profession	20(40)
39-48	8(16)	Clerical, shop owner, farmer	3(6)
49-60	3(6)		
Gender:		Semi -skilled worker	2(4)
Male	23(46)	Unskilled worker	1(2)
Female	27(54)	Unemployed	10(20)
Education:		**Socio economic class*Modified Kuppuswamy's scale**	
Profession course	16(32)		
Graduate or post graduate	28(56)		
Intermediate or post high school diploma	1(2)	Upper class (I)	14(28)
High school certificate	4(8)	Upper middle class (II)	31(62)
Middle school certificate	1(2)	Lower middle class (III)	5(10)

Table 2: Smart phone usage by study population (N=50)

S.no	Usage	N (%)
1	**Smart phone brand:**	
	Sony	7(14)
	Samsung	21(42)
	Micromax	7(14)
	Lava	2(4)
	HTC	7(14)
	Others*	6(12)
2	**Service provider:**	
	Airtel	23(46)
	Aircel	8(16)
	Vodafone	6(12)
	BSNL	4(8)
	Reliance	3(6)
	Tata docomo	4(8)
	MTS	1(2)
	Idea	1(2)
3	**Duration of smart phone usage:**	
	1 year	4(8)
	More than 1 year	21(42)
	More than 5 year	20(40)
	More than 10 year	5(10)
4	**Data recharge pack:**	
	Continuously without break	17(34)
	Only if needed	33(66)
5	**Total number of apps used:**	
	<5 app	13(26)
	5-10 app	24(48)
	10-20 app	12(24)
	20 app	1(2)

Others – Motorola, Moto G2, ASUS, Apple I phone, ELITE.

healthier food choices separately for male, female, children, aged and also suggestions for people suffering from diseases to be included. Fifty six percent and thirty six percent of the study population are willing to use and

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will try to use the FoodSwitch app in future respectively to make healthier food choices. Eight percent of the study population are not willing to use the FoodSwitch app to make healthier food choices in future. Fifty four percent of the study population feels that the FoodSwitch app helped them in making healthier food choices, forty percent of them feel it helped them in making healthier food choices but still can be better and six percent of them feel FoodSwitch app was not useful for them in making healthier food choices. Downloading the FoodSwitch app in the smart phones of the study participants was challenging due to poor network connectivity. Auto focus in cameras of the smart phone of the study population were not good enough to scan the bar codes quickly. Socio-Demographic profile: As in Table 1: Forty six percent of the study participant's fall in the age group of 18-28 years, fifty four percent of them are females and forty six percent where males. Eighty eight percent of them being graduates and above education level. Twenty eight percent of the study population belongs to upper socioeconomic class according to Kuppuswamy's socioeconomic status scale, forty percent study participants are semiprofessionals and twenty eight percent of them are professionals, twenty percent of the study population who are unemployed are house wives. Practice (Smart phone usage):As shown in Table 2:Forty six percent of the study participant's fall in the age group of 18-28 years, fifty four percent of them are females and forty six percent where males. Eighty eight percent of them being graduates and above education level. Twenty eight percent of the study population belongs to upper socioeconomic class according to Kuppuswamy's socioeconomic status scale, forty percent study participants are semiprofessionals and twenty eight percent of them are professionals, twenty percent of the study population who are unemployed are house wives. The main use of smart phone app and internet service by the study population (N=50) is for Google search and web access, online shopping, chatting and social networking, games. Six (12%) of them had other health related app in their phone such as pedometer, weight loss app, medical dictionary, physiotherapy app, medical news app. Attitude towards choosing food products: As shown in Table 3: Fifty six percent of the study population always wanted to make healthier food choices and forty percent of the population wanted to make healthier food choices sometimes. Forty two percent of them occasionally have the habit of choosing food products by seeing the calorie value and nutritive value in the label. Nutritive value is first most to be considered in the label by twenty eight percent of the study participants and thirty two percent of them consider price as important part in food label. Attitude towards FoodSwitch app: As in Table 4: Majority of them (98%) forty nine members of the study population are not aware of the app called FoodSwitch. Eighteen percent of them said they have used other apps like calorie carb and fat counter, zomato, domino's pizza

app, food recipes app and food panda app which are not actual food choosing apps but they are food delivery apps

Table 3: Attitude of the study population (N=50) towards choosing food products.

S.no	Choosing food products	N (%)
1	**Wanted to make healthier food choices**	
	Always	28(56)
	Sometimes	20(40)
	No	2(4)
2	**Habit of choosing food products by seeing calorie value and nutritive value in label**	
	Always	6(12)
	Occasionally	21(42)
	Rarely	13(26)
	No	10(20)
3	**First most to be considered in label**	
	Nutritive value	14(28)
	Price	16(32)
	Brand name	10(20)
	Manufacturing date	10(20)

Table 4: FoodSwitch app usage by the study population (N=50)

1	**Awareness about FoodSwitch app**	
	No	49(98)
	Yes, but not used before	1(2)
2	**Used other apps to choose food products**	
	Yes	9(18)
	no	41(82)
3	**Easy usage of FoodSwitch**	
	Very easy to use	38(76)
	Difficult to use	12(24)
4	**Features to be added to this app**	
	Yes	15(30)
	No	35(70)
5	**Willingness to use the app in future**	
	Willing to use	28(56)
	No	4(8)
	Will try to use	18(36)

and food recipe apps for choosing their food products. Seventy six percent of them feels that the FoodSwitch app is very easy to use. Thirty percent population of the study wanted other features such as including data about all food products, improvement in auto focus, suggesting

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more alternative food choices and the study population also wants the app to suggest healthier food choices separately for male, female, children, aged and also suggestions for people suffering from diseases to be included. Attitude towards FoodSwitch app: As in Table 4: Majority of them (98%) forty nine members of the study population are not aware of the app called FoodSwitch. Eighteen percent of them said they have used other apps like calorie carb and fat counter, zomato, domino's pizza app, food recipes app and food panda app which are not actual food choosing apps but they are food delivery apps and food recipe apps for choosing their food products. Seventy six percent of them feels that the FoodSwitch app is very easy to use. Thirty percent population of the study wanted other features such as including data about all food products, improvement in auto focus, suggesting more alternative food choices and the study population also wants the app to suggest healthier food choices separately for male, female, children, aged and also suggestions for people suffering from diseases to be included. Willingness of consumers in using the FoodSwitch app: As shown in figure 1: Fifty six percent and thirty six percent of the study population are willing to use and will try to use the FoodSwitch app in future respectively to make healthier food choices. Eight percent of the study population are not willing to use the FoodSwitch app to make healthier food choices in future. Perception of the study population about the usefulness of the FoodSwitch app in making healthier food choices during their first use in the study: As in the figure 2: Fifty four percent of the study population feels that the FoodSwitch app helped them in making healthier food choices, forty percent of them feel it helped them in making healthier food choices but still can be better and six percent of them feel FoodSwitch app was not useful for them in making healthier food choices.

Discussion: This study attempted to understand the willingness and perception of consumers about a food app, FoodSwitch in making healthier food choices. Participation in the study was voluntary and one time use of the mobile app during the interview for the study has been reported. As this is a relatively new app which is released in India, published literature on consumers experiences using this app are rare to be found. The widespread use of smart phones and access to internet is revolutionizing the way consumers address food related decisions. The food choices have an implication on the health of the family. FoodSwitch is a food app, introduced in India in Dec 2015, and found in our study 98% of them are not aware of this food app. This study gave them an opportunity to interact with medical students and learn about the features of the app and used it, which was consumer-friendly. As FoodSwitch is designed to help consumers make healthy food choices, in our study population, all the approached consumers, demonstrated

Figure 1: Chart showing willingness of the study population in using the FoodSwitch app in the future.
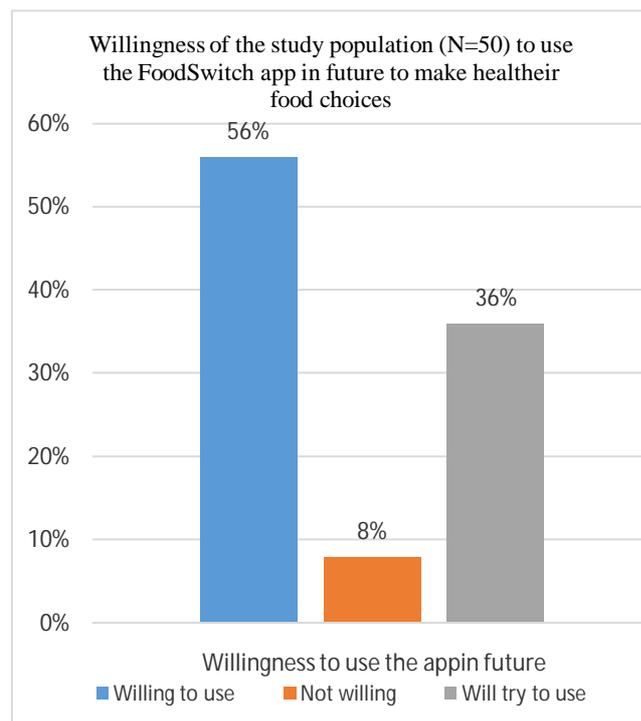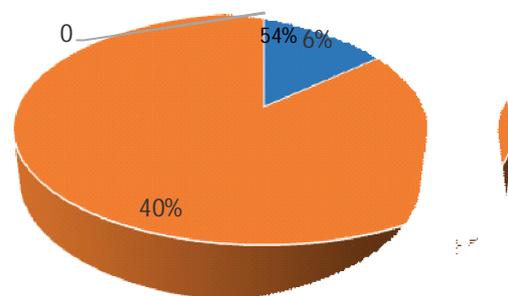

Figure 2: Perception of the study population about the usefulness of the FoodSwitch app in making healthier food choices during their first use in the study.

54% -Helpful in making healthier food choices
40%-useful but still can be better
6%-Not useful in making healthier food choices

willingness to use it at the time of the study and 56% self-reported willingness to use the app in future when making healthier food choices as they are impressed with the efficiency of the food app in helping them identify better healthier options of food items in a given category. Seventy six percent of the study participants also expressed that the app is easy to use and a substantial proportion (40%) of the study participants felt that the app can be improvised for better consumer experience, incorporating features for automatic barcoding scanner etc. About (54%) of the study participants reported that FoodSwitch app was helpful in making healthier food choices. This is less when compared with other studies.[13, 14 and 15]Though there is a recent shift in trends of consumers opting for healthier food choices [16], it is not

greatly reflected in our study as only 42% of the study participants make food choices based on nutritive value of the foods. Thirty two percent of study population still expressed that food price is an essential element when choosing food products. This brings to attention that government should make a comprehensive policy to bring down the prices of healthier food options like fruits and vegetables and encourage the population to consume less of the cheaper and calorie dense foods to address the epidemic of non-communicable diseases. No challenges were faced when interacting and facilitating the use of the app as consumers expressed satisfaction being made aware of this new app. We believe that raising awareness about these apps will enhance the consumer's abilities in choosing healthier food choices, and this study is an attempt towards this.

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