

Use of Online Internet Sources and Cellphone Apps Related to Health and Nutrition by Young People-their Perception and Experiences

Research Article

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Abstract

Background: Young people are comfortable using digital technology for their health and nutrition information needs. However, little is known for this region regarding which online sources and cell-phone apps are popular among young people and what are their perceived benefits and experiences of using them. Hence, the objective of this study was to investigate various health-nutrition-fitness related online sources and cell-phone apps used by young people (18-25 years) and their influence on the knowledge and practices of the subjects.

Method: There were two parallel online studies: one investigated the use of online sources (N=52) and the second studied the use of cell-phone apps (N=107). Participants returned completed google forms online which were then appropriately analysed.

Results: For health, exercise and nutrition, above 20% subjects visited celebrity dietitian Rujuta Diwekar and Shilpa Shetty Blogs, Instagram Pages and YouTube Channels; www.healthline.com in the website category and used popular apps such as Healthify me, Yoga and Touchkin. Useful features of these digital media stated by above 20% subjects were : useful for obtaining guidance regarding calorie and nutrition values of foods, healthy food recipes, guidance on workouts, setting goals and tracking physical activity, maintaining or losing weight. Above half (60%) mentioned getting useful information of nutrition, health and immunity relationship and all about healthy diets. A significantly higher number of cell-phone app users consumed protective vegetables and fruits frequently (above 4 times a week) as compared to non-app users ($p<0.01$ for these food groups). The proportion of subjects in nutritional status categories was significantly different ($p=0.004$) between users and non-users of cell-phone apps; example- underweight prevalence was 3.9% among users and 26.5 % among non-users of apps.

Conclusion: Thus digital media holds a lot of promise to guide young people along the path of good health and nutrition but they need to be informed adequately about how to effectively use these resources. Further research is required to understand various factors influencing choice of digital media by young people and the ways to make them more user-friendly for this group

Keywords: Nutrition; Youth; India; Digital Media; Online Internet Sources; Mobile Apps

Introduction

The term 'mHealth' is an abbreviation for mobile health, a term used for the practice of medicine and public health supported by mobile devices [1]. The value of mHealth has never been more popular, thanks to the abundance of devices and the ease of access they provide. Young people now days spend a huge amount of time searching for, selecting, and using mobile digital applications (apps); they are turning to apps and digital media as a primary source

of knowledge, communication, and entertainment [2]. There is also negative impact of social media such as reduced physical and psychological health, sedentary lifestyle, lack of adequate sleep, and mental health risks such as anxiety, stress, negative self-perception, body dissatisfaction, and social isolation [3].

Research done to understand perceptions and uses of the internet and various digital media like cell-phone apps has revealed a varied picture. In France, Montagni et al. [4] studied university student's use and opinions regarding ICT (Information-Communication

Technologies) for health and well-being was studied in 4 universities and it was found that about half (49.4%) had at least one health app, mostly for physical fitness activities and nutrition, pain and disease, stress, anxiety, and depression. These were also the most frequent topics accessed on websites. Participants believed that though Wikipedia was useful for health-nutrition and other information, however, institutional or official websites were more reliable sources.

As there is scanty information on perceptions and experiences of young people in India,

Particularly this western region of Gujarat, research was undertaken with the objective of

Investigating various health-nutrition-fitness related online sources and smartphone apps used by young people and their influence on the knowledge and practices of the subjects (18-25 years).

Methods and Materials

This study was an online descriptive study where data was collected virtually via an online google form because due to the Covid-19 pandemic, we were unable to have any face-to-face interaction with the subjects. This paper is a compilation of two parallel studies which were carried out with young people by our team – study A, investigated the use of various online internet sources used by young people; study B, investigated the use of various cell-phone apps by young people. In both the studies the age group of the participants was between 18 and 25 years.

Sampling Method: The samples were selected by purposive snowball technique through a network of family, friends, and other contacts, and through various social media platforms like WhatsApp, Instagram and others. In study A, out of 80 young people contacted, 52 consented to participate; in study B, out of 200 young people contacted, 107 consented to participate.

Tool for data collection: Enrolled participants filled up the Google Form sent online and emailed it to the research team. The form sought information on the following themes – background information, types of online sources and cell-phone apps used; types of information accessed and useful features of online sources and cell-phone apps, benefits according to the participants and drawbacks experienced using various digital media, nutritional status of the subjects and food intake frequency data.

Pre-testing of the tool: The google form was pre-tested online on 10 young people who did not participate in the study and were in the same age group. Based on their responses, the google form was modified and finalized.

Nutritional status assessment and food frequency method: From the weight and height data obtained from the participants, the Body Mass Index (BMI- kg/m^2) was calculated and was compared with the Asia Pacific Classification (2007) to determine nutritional status of the participants. With regards to food frequency, appropriate questions were formulated in the google form by which we obtained data on the frequency of intake of various food groups during the week.

Data Analysis: Quantitative Data in frequencies was automatically transferred into an excel sheet which was further used for data compilation and analysis. Qualitative Data- the responses of the subjects was read carefully, coded and segregated into major categories relative frequencies of these categories were obtained; for example- more, less, least (+++, ++, +).

Results

Several participants in the sample did not use online internet sources or cell-phone apps for nutrition and health information, hence their nutritional status and dietary quality was compared with those who did use digital media for this purpose. Perceptions and benefits of digital media and internet sources were analysed only for those who were using them, as seen in tables below.

Table 1 reveals that Rujuta Diwekar (Instagram Page) was used by more than one-third (39.1%) followed again by Rujuta Diwekar's Blog. With regards to cell-phone apps, Healthify me app was the one stated by the majority of the subjects (about one- third); apps on yoga were used by 17% of the subjects.

In general, online sources and cell-phone apps for health and nutrition were used by more females than males (example Healthify me app); whereas apps and online sources for fitness, body building and exercise were used more by males than females (example: Samsung Health).

Table 2 depicts the types of information accessed and features found useful from online internet sources and from cell-phone apps by the participants. Over half of the participants (61%) found that online sources helped them gain knowledge about healthy foods, calorie value of foods and relationship of nutrition to health. The app Healthify me was found to be useful for nutrient calculation of foods. Next most useful feature reported was physical activity and exercise related information as well as the facility to monitor the progress of exercise and workouts. A few participants stated that apps helped them in planning their day and monitoring their progress.

Table 3 further supports the data given in the earlier table and elaborates all the benefits mentioned by the participants on using online sources and various cell-phone apps. These benefits chiefly included, getting information on healthy recipes and healthy diets, building strength and immunity, getting detailed guidelines on how to do exercises and workouts, support to lose weight or maintain weight through dietary control and healthy eating. Participants who used fitness related online sources and apps said that they felt physically fit and relaxed and it helped them to achieve their health goals. A few mentioned that the reminder function in apps was useful; for example, drinking water.

Table 4 indicates an overall trend that a high frequency of intake of healthy food groups was seen in relatively more number of users of online sources or cell-phone apps as compared to the non-users. Further, the differences were statistically significant as regards the frequent intake of protective vegetables and fruits among mobile app users.

As Table 5 indicates, the major drawbacks reported after subjects used the digital media or internet sources (which also influenced many

Table 1: Name of the Health, Nutrition, and/or Fitness-Exercise related online sources and cell-phone apps used by the subjects (Top 5).

Names of online sources	Responses (N=23)		Names of cell-phone apps	Responses (N=51)	
	n	%		n	%
RujutaDiwekar (Instagram Page)	9	39.1	1. Healthify me	16	31.3
RujutaDiwekar (Blogs)	6	26.0	2. Yoga	9	17.6
www.healthline.com (Website)	3	13.0	3. Samsung Health	5	9.8
RujutaDiwekar (YouTube Channel)	4	17.3	4. Curefit	4	7.8
Shilpa Shetty (YouTube Channel)	3	13.0	5. Fitness and Bodybuilding	4	7.8

Table 2: Types of information accessed and features found useful by the participants (Top 5).

Types of information accessed/Useful features – online sources	Responses (N=23)		Types of information accessed/Useful features – cell-phone apps	Responses (N=51)	
	n	%		n	%
Useful information about diet, amount of food, total calories, nutrition information and its relation to health	14	60.8	1. Physical activity- information and monitoring progress	20	39.2
Tips related to exercise	13	56.5	2. Nutrient calculation of foods	9	17.6
Healthy food recipes and benefits	8	34.7	3. Daily task planning and tracking	8	15.7
Different types of workouts	5	21.7	4. Meal planning/healthy recipes	7	13.7
Healthy lifestyle	4	17.3	5. Self-monitoring	5	9.8

Table 3: Benefits of online sources and cell-phone apps as perceived by the participants (Top 5).

Major Categories of responses – online sources	Responses (N=23)		Major Categories of responses – cell-phone apps	Responses (N=51)	
	n	%#		n	%#
It provides information on healthy recipes and healthy diets	9	39.1	1. It helps them to maintain weight (Lose or Gain).	19	37.2
It helps to make our immunity strong and also gives us many health benefits	6	26.0	2. The app makes it easy to do exercise, set goals, and keep track of their daily physical activity	18	35.2
Have felt fit and relaxed	10	43.4	3. It helps them to control their diet, count calories of their diet, and suggest healthy recipes.	10	19.6
Contributed to healthy lifestyle and wellbeing	5	21.7	4. It helps to keep the body strong, energetic, and in good physical and mental health.	9	17.6
Information is easy to access, helps to transform body	3	13.0	5. Others (Water reminder, video guidance of exercise, and healthy recipes)	3	5.8

percent values add up to more than 100 or less than 100 because of multiple responses or 'no response in the specific question'.

Table 4: Frequency of intake of various food groups (high frequency) - Comparison of users and non-users of online sources as well as users and non-users of cell-phone apps.

Food groups (Frequency more than 4 days a week)	Users: Online sources		Non-users: Online sources		Users: Apps		Non-users: Apps	
	N=23		N=29		N=51		N=56	
	n	%#	n	%#	n	%#	n	%#
Cereals	22	95.6	24	82.7	42	82.4	40	71.4
Pulses	17	73.9	20	68.9	39	76.5	36	64.3
Green leafy vegetables*	19	82.6	21	72.4	42	82.4	34	60.7
Other vegetables*	21	91.3	23	79.3	43	84.3	37	66.1
Fruits*	16	69.5	21	72.4	28	54.9	24	42.8
Milk	16	69.5	24	82.7	32	62.7	42	75.0
Milk products (curd/buttermilk/cheese/ butter)	22	95.6	27	93.1	16	31.4	24	42.8
Dry fruits and nuts	19	82.6	18	62.0	20	39.2	42	75.0

percent values add up to more than 100 because of multiple responses

Note: Chi-square values comparing users and non-users of online sources for each food group were non-significant ($p > 0.05$).

*Chi-square values comparing users and non-users of cell-phone apps were significantly different ($p < 0.01$) indicating that prevalence was significantly higher among users of the apps than the non-users, for the three protective food groups: green leafy vegetables, other vegetables, and fruits.

Table 5: Drawbacks reported by the subjects and factors influencing discontinuation in use.

Drawback; why discontinued use	Frequency (+++, ++, +)*
Information not reliable in the online source; error in the app.	+++
Not enough memory in my phone; excessive use of battery	+++
Dislike the source; or find it less effective for my needs	++
Lack/Waste of time	++
App requires me to pay; so will not continue with it	+
Not needed as they have gained knowledge	+

Note: +++: relatively most frequent (above 60% responses); ++: less frequent (30-60%); +: least frequent (below 30%).

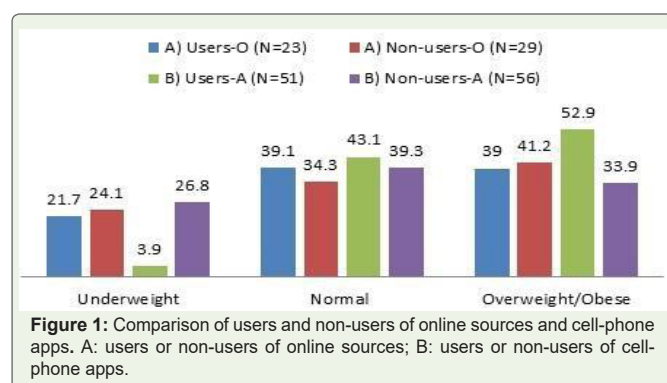
to discontinue use) were related to the reliability and effectiveness of the information and practical problems like they require payment to be made or that the cell-phone memory or battery life does not support its use.

Some of the statements of the subjects in their own words -

- "It (the app) basically told me that I'm fat! That I have got a high level of subcutaneous fat all over my body. It is really upset me."
- "When I downloaded it, it said I can have a free trial. But once it downloaded, it demanded my card details before I had even seen the main screen."
- "This is incredibly frustrating and it rarely works"
- Below are the suggestions given by the young subjects in their own words
- Watch and read only those online sources which are secure and don't always accept all the check boxes. Be safe from frauds.
- To not believe anything blindly and implement whatever is given online (or in the app).
- Use health, fitness and nutrition related online sources instead of wasting time on apps like TikTok.

Figure 1 shows that in the total sample, less than half of the subjects had normal BMI; and as many as 30-50% were overweight or obese which is a cause for concern. Further, one in four was underweight (except for the cell-phone app users). On comparing nutritional status of users and non-users of online internet sources, the chi-square values were non-significant. However, chi-square value comparing users and non-users of cell-phone apps with regards to nutritional status: (normal, underweight, and overweight/obese) was significant (p -value= 0.004). Underweight prevalence was significantly lower among cell-phone app users than the non-users.

Thus, Figure 1 indicates that while no clear trend was evident in terms of significant differences in the nutritional status between users and non-users; however, in one instance, underweight prevalence was much lower among users of cell-phone apps. This aspect needs further study, including several variables which influence nutritional status.



Discussion

The data of the study showed that the young people do access various types of digital media to get food, nutrition, exercise and fitness related information for themselves, with males being more interested in exercise and fitness; and females being more interested in diets and foods. The present study demonstrates that a variety of online sources and apps are becoming popular among young people. In particular, celebrity websites, blogs and Instagram pages like those of Rujuta Diwekar and Shilpa Shetty appear to be sought after. About half of the sampled subjects were users of digital media.

Elsewhere too it is reported that internet and social media use is growing rapidly in the youth group, and that about half of those studied say they access them regularly. Escoffery et al [5] surveyed above 700 students in universities of USA and found that above 50% of the respondents said that they prefer to get health information online, and about one in four said they'd like to participate in a health programme online.

Influence on quality of food intake: Though the results were not conclusive, trends towards healthier eating habits and greater intake of protective foods (vegetables, fruits), were observed among those who used cell-phone apps versus those who did not. It is likely that unhealthy food practices and unhealthy, sedentary lifestyles may reduce with proper use of social media information and support. Considering that unhealthy eating can lead to obesity problems in young people, Buchanan et al. [6] conducted a pre and post- test experimental research where the effects of online advertisement on the consumption patterns of young adults (18-24 years) were studied using energy drinks as a case example. Participants were randomly allocated to control or experimental group (each with 30 participants). After being exposed to two famous energy drink brands, websites, and social media pages, it was found that the experimental group felt encouraged to go for more energy drinks after the exposure. Authors concluded that unhealthy online ads can have an adverse effect on young adults. Thus, it is all the more important to understand in more depth how digital media can counteract such harmful influences.

Did nutritional status differ? In this study, a pattern towards less prevalence of underweight among users of health-nutrition apps was seen; as compared to those who did not use them.

According to De Cock et al. [7] it appears that commercial fitness and nutrition apps do influence healthy eating habits and BMI in adolescents. If effective behaviour change strategies are used as part of digital media content and mobile apps, several determinants of healthy eating can be influenced in young people. Their study in Belgium showed that along with use of digital media or social media, several factors influence healthy eating habits and nutritional status such as perceived behavioural control to eat healthy, attitudes of the adolescents towards healthy foods, family and social support and others. These factors also influence the frequency of use of health and nutrition focused apps and the BMI of the young people. Thus, behaviour change strategies should be incorporated in the apps.

Benefits and features of online sources or mobile apps: Our study participants chiefly found benefits in terms of getting concrete

guidance for action, such as how to do workouts, understand calorie value of foods or healthy food choices, various measures to lose or maintain weight or track the progress of their improved habits. A cross-sectional study in United States aimed to evaluate the behaviour change factors that are related to the use of diet and nutrition-related health apps, as well as whether the use of such apps is linked to health behaviour change. The majority of participants strongly agreed that using diet/nutrition apps resulted in improvements in their behaviour, including eating a healthy diet (58.5%), frequency of eating healthy foods (57.6%), and consistency of eating healthy foods (54.4%). Participants also gave positive responses to questions about diet/nutrition app engagement and likability. Diet and nutrition apps that focus on increasing motivation, desire, self-efficacy, attitudes, knowledge, and goal setting may be especially beneficial [8].

Research [9] has also shown that nutrition-information apps are effective in overcoming what consumers perceive as personal limitations in approaching healthy food, particularly among those who building their motivation and concretely planning actions in favour of healthy eating. Using a nutrition-information app appears to decrease the perception of the barriers to healthy food eating, improve perceived personal strength and self-confidence towards developing healthy habits.

More research is needed on how young people are using social media networks as health support tools and for peer-to-peer information sharing, including a focus on the content of these resources and the involvement of young social media influencers and celebrities [10].

Schiro et al [11] recommend that with the rapidly increasing usage among young people of digital media or social media, organisations posting content should not prioritize quantity over quality of the posts because if the quality is not good, there is little engagement by the viewers. They state that it is especially important that social media posts include video content because it greatly increases interest and engagement of young users and they cite data to illustrate that among millions of Facebook posts, those with videos led to almost 60% more engagement by visitors.

Further research on young people of various regions focusing on specific features of digital media and patterns of use which lead to behaviour change and improved health, weight and well-being will go a long way to harness the potential of mHealth for our next generation.

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