

Dietary assessment and physical activity of staff at Apollo and validation of Right Nutrition application

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Abstract:

Background: The need to validate application that promote healthy living becomes essential due to presence of innumerable applications present and the prompt use of technologies. **Objective:** 1.To establish the validity and reproducibility of the dietary component of a right nutrition app.2. To assess the diet and physical activity of staff of Apollo using REAP questionnaire.**Methods:** There were 119 adults (81female and 38 male), aged 18–25 years (mean, 22 ± 2 years) participated in the study. Participants entered their 24-hour dietary intake into right nutrition application on 1 recording day and underwent subsequent 24-hour dietary recalls that was recorded in the questionnaire .The REAP questionnaire was also used.

Results: Paired-samples t tests tested for mean energy ,protein and carbohydrates intake between the application and dietary recalls of the participants were insignificant, but the Paired-samples t tests tested for mean fat was significant ($p=0.034$).Majority of the staff in Apollo were having a low REAP score ie 34 which signifies a poor diet and physical activity choices. **Conclusions:** The right nutrition app is a valid classification measure for dietary protein, carbohydrates and energy intake. But the fat consumption showed a significant increase from the manual calculation. This tool could be used by the general public to increase awareness and intake of these nutrients. The staff of Apollo could be educated on the healthy lifestyle choices so that their health is not compromised and this would account to the man power in turn help in a better turnover of the hospital.

Date of Submission: 16-08-2017

Date of acceptance: 05-09-2017

I. Introduction:

Dietary changes can be helpful in preventing or treating a variety of prevalent health problems. There is a need for brief, user-friendly tools to enable rapidly and accurately assess patients' diets and exercise habits as well as provide information to aid the nutritionist in delivering effective nutrition counselling. Validation of a dietary intake assessment method is the procedure of confirming the validity of the method used to measure actual dietary intake over a specified time period .These assessments are used to measure the usual intake of the Subjects or patients. It is important to validate these tools to understand the magnitude and direction of measurement error, the causes that lead to it, and to discover ways to avoid or minimise these errors. It also provides us information on potential misclassification which becomes necessary in epidemiological studies specially related to diet-disease associations. (Lombard J Martini, 2015)

According to the Food and Drug Administration (FDA), mobile health apps are "medical devices that are mobile apps, meet the definition of a medical device and are an accessory to a regulated medical device or transform a mobile platform into a regulated medical device." (Honor, 2014). The availability of the Medical Applications and how it is rapidly developing will be able to show positive effects in the medical world. There are a number of Applications that are added each month. This makes the users difficult to select effectively and use information. (Gupta Girish, 2013)

The IMS Institute for Healthcare Informatics had a report submitted which concluded that out of 40,000 health care apps that are available in US Apple iTunes app stores Only 16,275 of these apps are directly linked to patient care and treatment and the others have no information that promotes wellbeing or their health . (Gauntlett Carolyn, 2013)

In health Applications the most downloaded Apps belong to the categories like weight loss which topped with (>50 million Apps), Exercises (>26.5 million Apps) and others (18 million Apps). Present day, clients require high quality care by monitoring closely —frequently—and patients need prompt warnings and alerts on neglecting their wellness.. (Kotlo Anirudh, 2015)

Prevalance And Magnitude

A number of apps let users log their meals and count their daily calories using searchable nutrition databases. Many even come equipped with barcode scanners, for easy logging of packaged foods. Studies show that self-tracking and understanding the calorie intake were able to lose more weight and maintain it on a long run. (A Kong, 2012).A researchfound that participants in a weight-loss program lost twice as much weight when they kept a food diary compared with when they did not. Approximately 13 pounds were lost. (Kaiser, 2008).They were able to keep "It's the process of reflecting on what you eat that helps us become aware of our habits, and hopefully change our behaviour," Dr. Keith Bachman, a Kaiser Permanente Care Institute Weight Management Initiative member, said in a statement at the time (Kaiser, 2008)

Statement Of The Problem:

Technology has become a big part of our daily lives, and it is important that we learn to use it constructively. Billions of people own smartphones that are packed with useful apps. They use wearable tech with sensors that sync with mobile devices - fitness trackers, smartwatches, for example.

A growing number of companies are offering digital tools to help improve their eating habits in hopes of increasing productivity, reducing sick days and cutting health care costs. Hence it becomes very important to validate these digital tools to meet our goals. However, no large randomized, controlled studies providing scientific evidence of the benefits of their use have been made. The aims of this study are to develop and validate a smartphone application. An evaluation is also made of the dietary choices of the participants.

The Availability of health care applications for both general public and health consumer has both advantages and disadvantages .On a positive note, each person can monitor themselves by noting down their blood pressure, heart rate, calorie intake, weight, and other personal data. Having data like this will help in a personal context. (Kendall, 2013)

The negative part of applications is that if the individual doesn't select suitable apps for their use, or may misuse the apps selected. For example, if an app does not measure a particular aspect of health correctly, it could mislead the user or set an ambitious goal that would be hard to achieve.(Kendall, 2013). The growing awareness of health and usage of applications makes it necessary to validate such applications. But there is less amount of work done to understand the impact of increased physical activity and improved eating habits and hence how it affects the health of the people who used them.(Caroline, et al., 2010). The current study was conducted to validate the right nutrition application and to understand lifestyle of Apollo employees.

II. Methodology

A cross-sectional study was carried at Apollo Hospitals with a sample size of 119 subjects. The age group of the subjects participating in the study was between 21 to 45 years. The data was collected face to face using questionnaires for 24-houe recall, food frequency and physical activity. Anthropometric measurements (height, weight, waist circumference and hip circumference) were also taken using standardized tools. A correlation study was then undertaken in which two different methods of calculation of the 24-hour recall i.e., 1) through the Right Nutrition Application and 2) manuallywas carried out. These results were then correlated with a standardized food frequency questionnaire called Rapid Eating Assessment for Patients (REAP) questionnaire. This questionnaire also captured their lifestyle and physical activity patterns. The population targeted for the study were the staffs and other employees of Apollo Hospital.

Anthropometry:

Weight was measured using a digital weighing scale, height was measured using a stadiometer and waist and hip circumference was measured using a measuring tape.

Using height and weight measurements, BMI was calculated. The formula used to calculate BMI was $BMI = \text{weight in kg} / (\text{height in m})^2$.

Waist and hip ratio was calculated using waist circumference and hip circumference measurements. The formula used was,

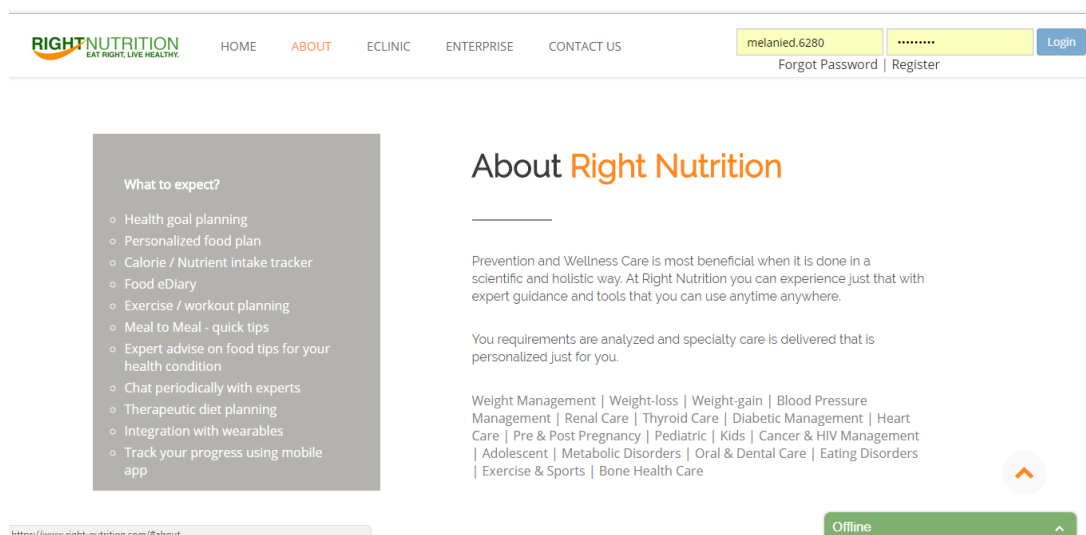
$WHR = \text{waist in cm} / \text{hip in cm}$

Questionnaires:

A general lifestyle questionnaire was used to collect the background of the subjects. A 24-hour recall questionnaire used to collect the information about their eating patterns and REAP questionnaire was also used to collect the food habits and physical activity patterns of the subjects.

Right Nutrition Application:

This application was used to calculate the 24-hour recall and the results were then compared to the manually calculated results.



Statistical analysis:

The data collected from the subjects was analysed using the SPSS software. Mean, median, frequency, standard deviation, t-test and correlation test were the statistical tests used for the analysis of the data.

III. Results And Discussion

The present study deals with assessing the lifestyle of staff of Apollo in Bangalore, Karnataka and also validating the right nutrition application. Information was collected regarding the socio – demographic profile, anthropometric measurements, lifestyle choices using REAP questionnaire 1 day dietary recall. Information was collected from a total of 50 patients during the period of data collection from March 15th, 2016 till June 1st, 2016 using a semi – structured validated questionnaire.

This chapter deals with the results and discussions of the collected samples subjected to statistical analysis. The data was tabulated and bar charts were made respectively along with the analysis.

This was across-sectional study carried out at Apollo hospital, Bangalore, Karnataka. Initially, the subjects were asked to fill the questionnaire and then their food recall was entered into the right nutrition application. The data was collected from 119 subjects during the period of data collection.

4.1 Sociodemographic Information Of Subjects In Apollo Hospital

Age in years (Mean age ± S.D) 28.78 ± 5.25	n	%
21-25	50	42
26-30	37	31.1
31-35	13	10.9
35-40	19	16

4.1.1 Age: According to this table the average age (± S.D) was 28.78± 5.25years (Range: 24 – 40 31.1(37%) .13(10.9%) people belonged 31 -35 years and 19(16%) belonged to 31-35 years.

4.1.2 Gender:

	Frequency	Percent
Valid male	38	31.9
female	81	68.1
Total	119	100.0

According to this table, there were 81(68%) females and 38(31.9) males.

4.1.3 Religion:

		Frequency	Percent
Valid	hindu	65	54.6
	muslim	8	6.7
	catholic	45	37.8
	buddhist	1	.8
	Total	119	100.0

According to the above table, 65(54.6%) of them were Hindu, 45(37.8%) were catholic, 8(6.7%) were Muslim, 1(8%) was Buddhist.

4.1.4 Marital status:

		Frequency	Percent
Valid	married	40	33.6
	unmarried	79	66.4
	Total	119	100.0

Among the 119 subjects, the more predominant were unmarried is 79 (66.4%) and 40 (33.6%) were married.

4.1.5 Type of family:

		Frequency	Percent
Valid	nuclear	99	83.2
	joint	18	15.1
	not applicable	2	1.7
	Total	119	100.0

Most of the subjects according to this table were from nuclear family i.e., 99(83.2%), 18(15.1%) of them belonged to joint family and 2 of them were from non-applicable group.

4.1.6: Education:

		Frequency	Percent
Valid	high school certificate	4	3.4
	post high school diploma or intermediate	4	3.4
	graduate/ postgraduate	92	77.3
	profession of honours	19	16.0
	Total	119	100.0

According to this table, 92(77.3%) of them were graduate /postgraduate,19 (16%)of them had profession of honors degree, 4 (3.4%)of them perceived to high school certificate, and 4(3.4%) of them perceived post high school diploma.

4.1.7: BMI:

		Frequency	Percent
Valid	Normal	57	47.9
	Obese I	29	24.4
	Obese II	7	5.9
	Overweight	12	10.1
	Underweight	14	11.8
	Total	119	100.0

According to this table, most of the subjects belonged to normal category, ie 57(47.9%). 29 (24.4%) of them belonged to obese one category, 14(11.8%) were underweight, and 12(10.1%) of them were overweight and 7(5.9%) were obese 2 category.

IV. Breakfast Consumption Among The Subjects In Apollo Hospital:

4.2.1 Prevalence of skipping breakfast:

		Frequency	Percent
Valid	yes	42	35.3
	no	54	45.4
	sometimes	23	19.3
	Total	119	100.0

According to this table, 54(45.4%) subjects do not skip breakfast, while 42 (35.3%) used to skip breakfast.

4.2.2 Reasons for skipping breakfast:

		Frequency	Percent
Valid	work pressure	10	8.4
	habit	3	2.5
	unable to prepare	5	4.2
	away from family	7	5.9
	lack of time	41	34.5
	nil	53	44.5
	Total	119	100.0

This table shows us that most of the subjects skip breakfast because of lack of time ie 41(34.5%), 10 (8.4%) of them skipped breakfast due to work pressure, 7(5.9%) of them were away from family which made them skip breakfast, 5 (4.2%) were unable to prepare and 3(2.5%) of them have a habit of skipping breakfast.

4.3. Assessment Of Diet And Physical Activity Of Subjects In Apollo Hospital Using Reap Questionnaire:

Table 4.3 illustrates the diet and physical activity of subjects using the REAP questionnaire.

4.3.1 Consumption of outside meals:

		Frequency	Percent
Valid	usually often	16	13.4
	sometimes	51	42.9
	rarely	44	37.0
	does not apply to me	8	6.7
	Total	119	100.0

According to this table , 51(42.9%) subject sometime go and eat 4 or more meals from outside , 44(37%) rarely ate outside, 16 (13.4%)of the subjects usually eat outside does not apply to them and for 8(6.%) it does not apply to them since they eat most meals at home .

4.3.2 Consumption of grains:

		Frequency	Percent
Valid	usually often	8	6.7
	sometimes	22	18.5
	rarely	86	72.3
	does nt apply to me	3	2.5
	Total	119	100.0

According to this table, 86(72.3%) of them eat less than 3 servings of whole grain products a day .while 22(18.5%) of them ate less than 3 servings of grains per day, 8 (6.7%) usually often ate less than 3 serving and for 3(2.5%) does not apply to them.

4.3.3 Consumption of fruits:

		Frequency	Percent
Valid	usually often	54	45.4
	sometimes	42	35.3
	rarely	20	16.8
	does not apply to me	3	2.5
	Total	119	100.0

According to this table, 54(45.4%) of them usually eat less than 2-3 servings of fruits aday .while 42(35.3%) of them sometimes ate less than 3 servings of fruits per day, 20 (16.8%) rarely ate less than 3 serving and for 3(2.5%) does not apply to them.

4.3.4 Consumption of vegetables:

		Frequency	Percent
Valid	usually often	45	37.8
	sometimes	49	41.2
	rarely	25	21.0
	Total	119	100.0

According to this table, 45(37.8%) of them eat less than 3-4 servings of vegetable a day .while 49(41.2%) of them ate less than 3 servings of vegetable, 25(21%) rarely ate less than 3 serving .

4.3.5 Consumption of dairy and dairy products:

		Frequency	Percent
Valid	usually often	46	38.7
	sometimes	36	30.3
	rarely	34	28.6
	doe not apply to me	3	2.5
	Total	119	100.0

According to this table, 46(38.7%) of them usually often eat less than 3 servings of dairy and dairy products a day .while 36(30.3%) of them sometime ate less than 3 servings of dairy and dairy products per day , 34(28.7%)usually often ate less than 3 serving and for 3(2.5%) does not apply to them.

4.3.6 Consumption of cheese:

		Frequency	Percent
Valid	usually often	7	5.9
	sometimes	8	6.7
	rarely	69	58.0
	does not apply to me	35	29.4
	Total	119	100.0

According to this table, 69(58. %) of them use rarely cheese, while 35(29.4%) do not use cheese .among the subject 8(6.7%) sometime had cheese and 7 of them often had cheese.

4.3.7 Consumption of whole milk:

		Frequency	Percent
Valid	usually often	58	48.7
	sometimes	23	19.3
	rarely	32	26.9
	does not apply to me	6	5.0
	Total	119	100.0

According to this table, 58(48.7%) of them usually had whole milk than skim milk, while 32(26.9%) of them rarely consumed whole milk .23 (19.3%) sometime had whole milk than skimmed milk and 6(5%) did not consume milk.

4.3.8 Consumption of red meat:

		Frequency	Percent
Valid	usually often	14	11.8
	sometimes	15	12.6
	rarely	49	41.2
	does not apply to me	41	34.5
	Total	119	100.0

According to this table, 49(41.2%) of them rarely used red meat, while 41(34.5%) of them did not eat red meat .15 (12.6%) sometime had red meat more than twice a week and 14(11.8%) often usually at more than 2 servings of red meat per week.

4.3. 9 Consumption of chicken/fish:

		Frequency	Percent
Valid	usually often	13	10.9
	sometimes	37	31.1
	rarely	42	35.3
	does not apply to me	27	22.7
	Total	119	100.0

According to this table, 42(35.3%) of them rarely eat chicken/fish more than 6 ounces per day 37(31.1 %) sometimes eat chicken /fish more than 6 ounces. while 27(22.7%) of them rarely at chicken every day and 13(10.9%) usually ate chicken /fish more than 6 ounces per day.

4.3. 10 Consumption of high fat red meat.

		Frequency	Percent
Valid	usually often	4	3.4
	sometimes	10	8.4
	rarely	65	54.6
	does not apply to me	40	33.6
	Total	119	100.0

According to this table, 65(54.6%) of them rarely at high fat red meat, 40(33.5%) did not eat such meats while 10(8.4%) of them sometimes consumed high fat red meat and 4(3.4%) often ate high fat/ red meat.

4.3. 11 Consumption of chicken with skin:

		Frequency	Percent
Valid	usually often	9	7.6
	sometimes	24	20.2
	rarely	53	44.5
	does not apply to me	33	27.7
	Total	119	100.0

According to this table, 53(44.5%) of them rarely ate chicken with skin, 33(27.7%) did not eat such meats while 24(20.2%) of them sometimes consumed chicken with skin and 9(7.6%) often ate chicken with skin.

4.3. 12 Consumption of processed meats:

		Frequency	Percent
Valid	sometimes	10	8.4
	rarely	48	40.3
	does not apply to me	61	51.3
	Total	119	100.0

According to this table, 61(51.3%) of them do not eat processed foods, 48(40.3%) rarely eat processed foods while 10(8.4%) of them sometimes ate processed foods.

4.3. 13 Consumption of fried foods:

		Frequency	Percent
Valid	usually often	11	9.2
	sometimes	51	42.9
	rarely	44	37.0
	does not apply to me	13	10.9
	Total	119	100.0

This table illustrates that, 51(42.9%) of them sometimes eat fried foods, 44(37.7%) rarely eat fried foods while 13(10.9%) of them claimed to not eat fried foods and 11 (9.2%) usually often ate fried foods.

4.3. 14 Consumption of oily food instead of healthy food:

		Frequency	Percent
Valid	usually often	21	17.6
	sometimes	54	45.4
	rarely	42	35.3
	does not apply to me	2	1.7
	Total	119	100.0

This table shows us that, 54(45.4%) of them sometimes chose oily food than healthy foods like high fiberbiscuits, 42(35.3%) rarely ate oily foods, while 21 (17.6%) of them usually chose fired foods over healthy foods. And for 2 (1.7%) this had not applied to them.

4.3. 15 Consumption of salad dresings:

		Frequency	Percent
Valid	usually often	1	.8
	sometimes	17	14.3
	rarely	77	64.7
	does not apply to me	24	20.2
	Total	119	100.0

This table shows us that, 77(64.7%) of them rarely use salad dressing. 24(20.2%) of them do not eat salad dressings or mayonnaise, while 17 (14.3%) sometimes uses salad dressing or mayonnaise instead of low fat dressing and only 1 (0.8%) salad dressing or mayonnaise instead of low fat dressing often .

4.3. 16 Consumption of butter or ghee on the table:

		Frequency	Percent
Valid	usually often	7	5.9
	sometimes	37	31.1
	rarely	62	52.1
	does not apply to me	13	10.9
	Total	119	100.0

This table shows us that, 62(52.7%) of them rarely use butter or ghee on the table while eating. 37(31.1%) of them sometimes use them, while 13(10.9%) of them do not use them on the table and 7 (5.9%) usually often use butter or ghee at the table while eating.

4.3. 17 Consumption of butter or ghee for cooking:

		Frequency	Percent
Valid	usually often	12	10.1
	sometimes	36	30.3
	rarely	67	56.3
	does not apply to me	4	3.4
	Total	119	100.0

This table shows us that, 67(56.3%) of them rarely consume butter or ghee. 36(30.3%) of them sometimes consume butter or ghee in their cooking, while 12 (10.1%) of them usually use them in the cooking and 4(3.4%) do not use it.

4.3. 18 Consumption of sweets on regular basis:

		Frequency	Percent
Valid	usually often	17	14.3
	sometimes	47	39.5
	rarely	51	42.9
	does not apply to me	4	3.4
	Total	119	100.0

This table shows us that, 51(42.9%) of them rarely consume sweets. 47(39.5%) of them sometimes consume sweets on regular basis while 17 (14.3%) usually consume sweets on regular basis and 4(3.4%) do not consume sweets.

4.3. 19 Consumption of ice cream on regular basis: _ _

		Frequency	Percent
Valid	usually often	13	10.9
	sometimes	48	40.3
	rarely	57	47.9
	does not apply to me	1	.8
	Total	119	100.0

This table shows us that, 57(47.9%) of them rarely consume ice cream. 48(40.3%) of them sometimes consume ice cream on regular basis while 13 (10.9%) usually consume on regular basis and 1(0.8%) do not consume ice cream.

4.3. 20 Consumption of high sodium processed foods:

		Frequency	Percent
Valid	usually often	5	4.2
	sometimes	27	22.7
	rarely	80	67.2
	does not apply to me	7	5.9
	Total	119	100.0

This table shows us that, 77(64.7%) of them rarely use salad dressing. 24(20.2%) of them do not eat salad dressings or mayonnaise, while 17 (14.3%) sometimes uses salad dressing or mayonnaise instead of low fat dressing and only 1 (0.8%) salad dressing or mayonnaise instead of low fat dressing often .

4.3. 21 Consumption of table salt:

		Frequency	Percent
Valid	usually often	2	1.7
	sometimes	14	11.8
	rarely	95	79.8
	does not apply to me	8	6.7
	Total	119	100.0

This table shows us that, 2(1.7%) of them rarely use . 24(20.2%) of them do not eat salad dressings or mayonnaise, while 17 (14.3%) sometimes uses salad dressing or mayonnaise instead of low fat dressing and only 1 (0.8%) salad dressing or mayonnaise instead of low fat dressing often .

4.3. 22 Consumption of soft drinks on regular basis :

		Frequency	Percent
Valid	usually often	13	10.9
	sometimes	31	26.1
	rarely	60	50.4
	does not apply to me	15	12.6
	Total	119	100.0

This table shows us that, 60(50.4%) of them rarely consume soft drinks. 31(26.1%) of them sometimes consume soft drinks on regular basis while 13 (10.9%) usually consume soft drinks on regular basis and 15(12.6%) do not consume soft drinks.

4.3. 23 Consumption of alcohol:

		Frequency	Percent
Valid	sometimes	10	8.4
	rarely	53	44.5
	does not apply to me	56	47.1
	Total	119	100.0

This table shows us that, 53(44.5%) of them rarely consume alcohol. 10(8.4%) of them sometimes consume alcohol on regular basis while 56(47.1%) do not consume alcohol.

4.3. 24 Duration of physical activity:

		Frequency	Percent
Valid	usually often	20	16.8
	sometimes	40	33.6
	rarely	49	41.2
	does not apply to me	10	8.4
	Total	119	100.0

This table shows us that, 49(41.2%) of them rarely perform physical activity. 40(33.6%) of them sometimes perform physical activity on regular basis while 20(16.8) usually perform physical activity on regular basis and 10(8.4%) do not perform activity.

4.3. 24 Duration of watching television:

		Frequency	Percent
Valid	usually often	25	21.0
	sometimes	42	35.3
	rarely	50	42.0
	does not apply to me	2	1.7
	Total	119	100.0

This table shows us that, 0(42.0%) of them rarely watch television. 42(35.3%) of them sometimes watch television on regular basis while 25(21%) usually watch television on regular basis and 2(1.7%) do not watch television.

4.3. 24 REAP score classification:

The following reap score were added by keeping “usually often”as 1 and “does not apply to me” as 4 and the total was divided into low, average, high and very high based on the quartiles that we got. This signifies that higher the score, the better is the lifestyle of the staff of apollo .

		Frequency	Percent
Valid	average	31	26.1
	high	27	22.7
	low	35	29.4
	very hig	26	21.8
	Total	119	100.0

This table illustrates that , out of 119 subjects, 35(29.4%) of them had achieved low score ,31 (26.1%) had achieved average,27(22.7%) of them had high score and 26 (21.8%)had a very high score.

4.4.: Association Of Bmi Class And Reap Score:

		reap_score_class				Total
		average	high	low	very hig	
BMI_CLASS	Normal	10	19	19	9	57
	Obese I	5	14	5	5	29
	Obese II	1	1	3	2	7
	Overweight	4	4	3	1	12
	Underweight	8	1	4	1	14
Total		28	39	34	18	119

This table illustrates that among the normal BMI class, 19 of them had low REAP score and 19 of them had high REAP score whereas 9 had very high REAP score and 10 had average REAP score .Among the overweight people 4 of them had average REAP score and other 4 had high scores, whereas 3 of them had low and 1 of them had high REAP scores. Among the obese 1 class, 14 of them had high REAP score, 5 of them had low REAP score and 5 of them very high and 5 of them had average REAP scores. Among the obese 2 category, 3 of them had lower scores, 2 of them had higher scores, and each of them had average and high REAP scores. In the underweight category, 8 of them had average scores, four of them had low scores, and each one them had high and very high scores.A similar study was also found where there was no co relation between the food intake patterns and BMI.(Togo, Olser, & al, (2001) 25).

4.5 Association Of Waist Hip Ratio Class And Reap Score:

		reap_score_class				Total
		average	high	low	very hig	
W_H_Class	normal	16	18	25	10	69
	risk	15	9	10	16	50
Total		31	27	35	26	119

According to this table, in the normal waist hip ratio category , 25 of them had a low REAP score , 18 of them had a high score, 16 of them had an average score and 10 of them had a very high REAP score. In the risk category, 16 of them had a very high score, 15 of them had an average score, 9 of them had a high score and 10 of them had a low score. This concludes that that both the class are at equal risk of unhealthy diet choices.

4.5 Association Of Right Nutrntion Application Calulation And Manual Calculation:

Nutrients	Mean	T-value	P-value	95% CI	
				Lower	Upper
Energy manual	1511.28±405.42	.533	.596	-81.48690	140.33927
Energy right nutrition	1481.81±479.47				
Protein manual	46.92±14.1	-1.316	.194	-6.94688	1.44935
Protein right nutrition	49.670±18.4				
Fat manual	39.675±15.35	-2.185	.034	-10.38937	-.43486
Fat right nutrition	45.087±13.81				
Carbohydrates manual	241.514±65.01	1.879	.066	-1.17092	34.78044
Carbohydrates right nutrition	224.710±75.68				

The mean intake of Energy manually calculated was 1511kcal and that calculates by right nutrition was 1481.81kcal. This shows us that it's statistically insignificant (p=.596). This shows us that there is no significant

difference between both the calculations. The mean intake of Protein manually calculated was 46.92gms and that calculated by right nutrition was 49.67gms. This shows us that it is statistically insignificant ($p=.194$). This shows us that there is no significant difference between both the calculations even though the mean manual calculation is lower than the right nutrition calculation. The mean intake of Fat manually calculated was 36.6gms and that calculated by right nutrition was 45.087gms. This shows us that it is statistically significant ($p=.034$). This illustrates us that there is a significant difference between both the calculations. The fat calculated by right nutrition is much greater than fat calculated manually. The mean intake of Carbohydrates manually calculated was 241.54gms and that calculated by right nutrition was 224.7gms. This illustrates us that it is statistically insignificant ($p=.066$). This illustrates us that there is no significant difference between both the calculations. The carbohydrates calculated by right nutrition is lesser than it was calculated manually but not of statistical significance.

V. Summary And Conclusion

The right nutrition app is a valid classification measure for dietary protein, carbohydrates and energy intake. But the fat consumption showed a significant increase from the manual calculation. This tool could be used by the general public to increase awareness and intake of these nutrients. The staff of Apollo could be educated on the healthy lifestyle choices so that their health is not compromised and this would account to the man power in turn help in a better turnover of the hospital.

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RegiMary. "Dietary assessment and physical activity of staff at Apollo and validation of Right Nutrition application." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* , vol. 6, no. 4, 2017, pp. 41–53.