



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

IMPACT OF NUTRITION AND EXERCISE ON EDUCATION AND HEALTH OF YOUTH – A REPORT

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ABSTRACT

Nutrition and health of young children is always a reason for concern in recent days. Since the past two decades a change in life style, changes in food intake, increase sedentary living and rat race for being a topper has led to increasing incidences of diseases and psychological disorders in young individuals. There are many incidences in recent days, indicating hyper tension and increased sensitivity in children that have led to their death. Many youth between the age group of 16 to 22 years have reported health issues like Anemia, low BP, hypertension, sleeplessness which have affected their performance at college. Taking into note all these situations around, a sample case study was done in which data was collected from 50 students between the age group 16 to 22. A questioner was prepared and the collected data was analyzed. It was observed that only 50% of the students consume 3 meals per day, 37% of the students were skipping their breakfast which has affected their performance at school or college. Around 53% of the students had some or the other physical activity and such students no such issues as sleeplessness. The present study has revealed that students having good food intake, having a number of small meals, and good sleeping time can excel in their education. A stress-free environment and a good support system at home are required for today's youth to lead a healthy life.

Key words: Nutrition and health, Health of youth, Effect of life style on health, Effect of stress on health, Food intake and health.

INTRODUCTION

India is one of the most populated countries that has one-third of its population as youth, who are of the age group of 10 to 24 years. These people account for around 253 million people [1] in the world. And it is essential to ensure that this group becomes a part of the constructive force that can contribute to the growth of a nation. Their well being, their knowledge, their attitudes and skill transform them into competent individuals [2]. Many researchers have studied adolescent health issues in our country and have identified that they suffer from issues like under nutrition or over nutrition, stress, anxiety, some get addicted to alcohol, tobacco while few have a high risk of sexual behaviors and intentional violence [3-6].

To overcome these issues, healthy living is essential which includes, consuming a healthy diet, having a meal plan, exercise and social interactions. It has been observed that adolescents know about healthy eating and the problems that they can get out of unhealthy eating habits [7]. A minimum of 3 times meal with healthy snacks is recommended for youth. Along with a healthy diet youth also need physical activity. Since the past two decades a change in life style, changes in food intake, increase sedentary living and rat race for being a topper has led to increasing incidences of diseases and psychological disorders in young individuals. A healthy body is a the temple for healthy mind [8]. Few hours of physical activity is known to increase the cognitive skills of people and also contribute to their increased academic performance [9,10]. In recent days many incidents of youth suffering from hypertension, sleeplessness, increased crime, and also increased death rate is observed [3]. WHO reports stated that around 1.1 million adolescent children die every year which accounts for nearly 3000 deaths every day [11] and WHO recommended at least 60 minutes of daily exercise for healthy living.

Few reports have shown that female students face slightly more stress than their fellow male students [12]. This level of stress is due to the present education system which pose them increase challenges, high expectations, long study hours etc [13,14]. Stress deteriorates immune system [15] and change in life style, diet and exercise is reported to help increase in immune responsiveness [16]. Effect of stress on heart rate variability is due to stress during exams [17], and also the effect of High power Resonance Frequency from mobile phones on health [18] indicates that over pressurizing during exams and over use of mobile phones for relaxation both can effect functioning of heart. Keeping the above issues, a survey was conducted in which data was collected from 50 youth between the age group of 16 to 22 years and the data was analyzed in terms of healthy eating habits, exercise, academic performance and health issues if any.

STUDY METHOD

In the present study, a survey was conduction by preparing questioner which comprises of variables like: Age, Gender, Number of meals per day, Whether they are consuming breakfast or skipping it, Involvement in sports-related activities, Sedentary time (hours) - the time which they sit which can be in class or at home, Sleeping time (Hours that they sleep), their wake up time, Education status- whether students are excellent, good, average or poor performers and Health issues if any. A questioner was prepared having all these options listed and youth between the age group of 16 to 22 years were asked to fill their details. The name of students is not asked as the questioner had health issues if any and hence name is to be kept anonymous. Both male and female students were asked to fill their details and among the 50 students 27 were females and 23 were males. Among them 10 girls are of the age of 16 years, 4 are 17 years, 4 are 18 years, 4 are of 19 years, two each of 20 and 21 years and 3 girls are of 22 years. Among the boys, 6 are of 16 years, 4 of 17 years, 2 of 18 years, 4 are of 19 years, 5 are of 20 years and 1 each of 21 and 22 years.

DATA ANALYSIS METHODS

Mean: Mean refers to an intermediate value between a discrete set of numbers. The equation used for calculating the mean for the data set under analysis is :

$$\bar{x} = \frac{(\sum x)}{n}$$

Where, X is the value of variables and n is the total number of samples

Median: It is the value that divides the sample into two halves. It is the value of the data sample whose physical location is between the rest of the number.

Mode: It the value of the data set that has the highest number of recurrences.

Range: It is the range of data set under investigation which is the difference between the largest and the smallest value.

Variance: It is the expectation of the squared deviation of a variable from its mean. It indicates how far a set of numbers are spread out from its average value. It is square of standard deviation.

Standard deviation: It is the measure of the amount of variation or dispersion of a set of value. Low standard deviation indicates that the values are close to mean, while a high value indicates that the values are spread out over a wider range. Formula used to

Calculate standard deviation is:

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

Where $\{x_1, x_2, \dots, x_N\}$ are the observed values of the sample items, \bar{x} is the mean value of these observations, and N is the number of observations in the sample.

Mean deviation: It is the average of absolute deviations or the positive difference of given data. The absolute values of the difference between the data points and their central tendency are totaled and divided by the number of data points.

Coefficient of variation (CV): It is defined as the ratio of the standard deviation to mean. The equation used to calculate Coefficient of variation is:

$$\text{Coefficient of variation \%CV} = \text{Standard deviation} \times 100 / \text{Mean}$$

Percentage relative mean deviation (%RMD): The relative average deviation of a data set is defined as the mean deviation divided by the arithmetic mean, multiplied by 100. High values of %CV and %RMD indicates a poor set of values.

$$\text{Percentage relative mean deviation \%RMD} = \text{Mean deviation} \times 100 / M$$

RESULTS AND DISCUSSION

The data obtained from people is used analyzed for mean, median, mode, range, variance, standard deviation, mean deviation, coefficient of variation and Percentage relative mean deviation and are listed in table 1. All the samples were initially analyzed followed by analysis of girls and boys separately. From the mean for a number of meals per day, girls had lower mean value as compared to boys indicating their decrease in meal count per day. While mean values for sedentary time and sleeping time for girls are less than boys indicating that they do are slightly active than boys and girls sleep little more than boys indicating good health. The mean value for girls regarding wake up time indicates that girls wake up early than boys which indicates good life style.

Table 1: Statistical analysis of samples

Analysis for all samples				
Analysis	No. of meals	Sedentary time	Sleeping time	Wake up time
Mean	3.1666	10.7333	6.5333	6.82
Median	3.0000	11.5000	6.0000	7.00
Mode	3.0000	12.0000	6.0000	6 and 8
Range	2.0000	6.0000	3.0000	3.50
Variance	0.4722	4.3955	0.9823	
Standard deviation	0.6872	2.0965	0.9909	
Mean deviation	0.5556	1.8778	0.8711	
%CV	21.7015	19.5326	15.1669	
%RMD	17.5582	17.4951	13.3338	
For girls				
Analysis	No. of meals	Sedentary time	Sleeping time	Wake up time
Mean	2.8750	10.5625	6.6250	6.4687
Median	3.0000	10.0000	6.0000	6.3000
Mode	3.0000	8.0000	7.0000	6.0000
Range	2.0000	6.0000	3.0000	3.0000
Variance	0.5166	5.3291	1.1833	
Standard deviation	0.7180	2.3084	1.0877	

deviation				
Mean deviation	0.5468	2.0078	0.9531	
%CV	24.9739	114.9716	16.4181	
%RMD	19.7826	19.0088	14.3864	
For Boys				
Analysis	No. of meals	Sedentary time	Sleeping time	Wake up time
Mean	3.5000	10.9285	6.4285	7.2214
Median	3.5000	12.0000	6.0000	7.3000
Mode	3 to 4	12.0000	6.0000	7.3000
Range	1.0000	6.0000	3.0000	2.3000
Variance	0.2500	3.6377	0.8163	
Standard deviation	0.5000	1.9073	0.9035	
Mean deviation	0.5000	1.6612	0.7755	
%CV	14.2857	17.4524	14.0546	
%RMD	14.2857	15.2003	12.0635	

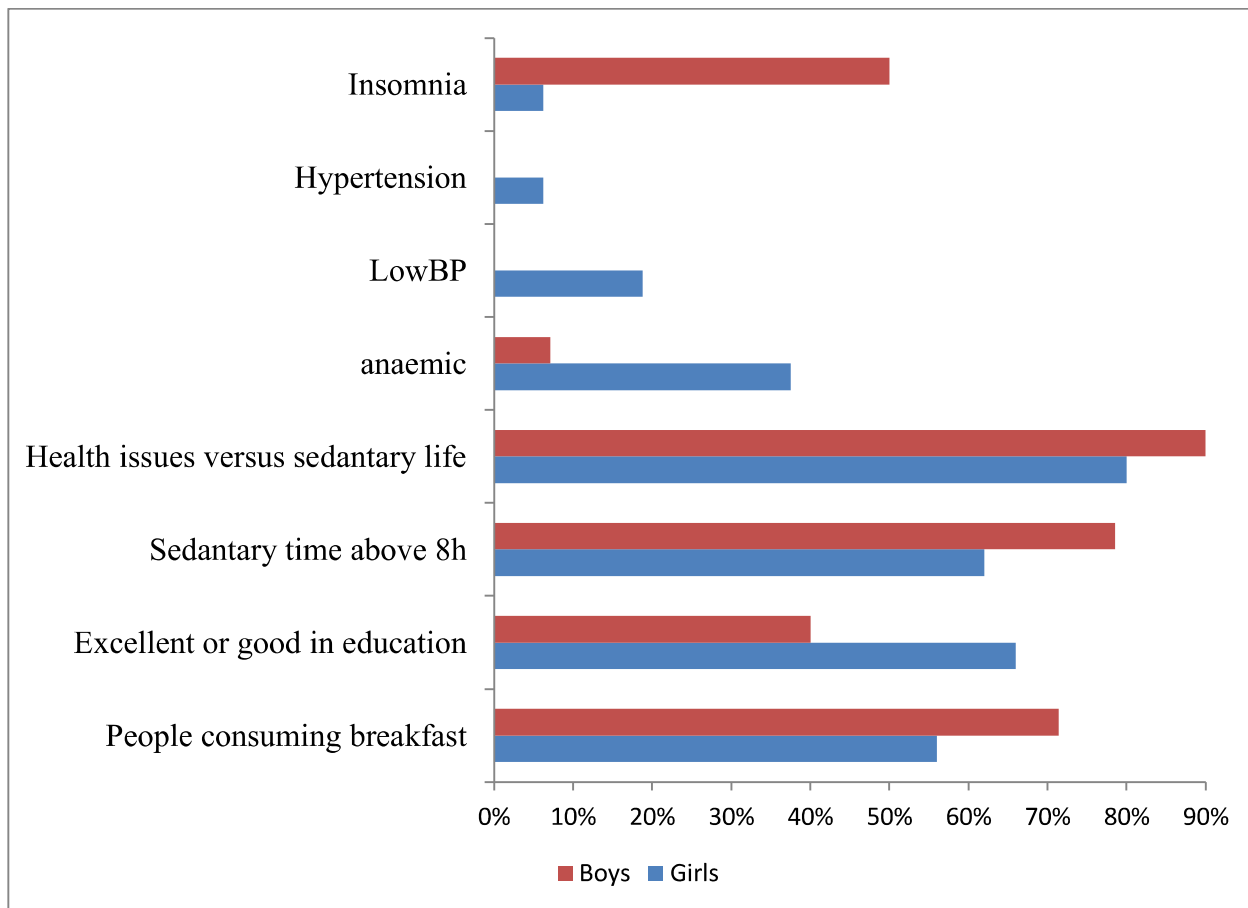
The median and mode values for all the variables are almost the same. Variance for a number of meals and sleeping time is less indicating the good choice of range and not much variability, while a variance of 4.39 indicates a stretch of variables. The mean deviation for the number of meals and sleeping time is less than 1 while for sedentary time spent if more. A low percentage of %CV and %RMD indicates that the values are a good set.

ANALYSIS OF HEALTH OF YOUTH

The health of girls and boys under study are analyzed and compared for their food intake against academic performance and health issues. Among the girls only 56.25% consumed breakfast while 71.42% of boys consumed breakfast. Around 66.66% of girls were good at education while only 40 % were good at education. This can be correlated to the sedentary life. Only 62.5% of girls had a sedentary life for more than 8 hours, while 78.57% of boys were leading a sedentary life. Most of the boys spend time sitting beyond college hours while few girls had a sedentary life. 50% of girls were involved in sports while among the samples studied only 35.71% involved in sports. Among the people having sedentary life, 80% of them had health issues while 90% of boys had health issues due to sedentary life. The most prominent health issues among girls are anemic nature and low BP. Around 37.5% of girls are anemic while it is just 7.14% in boys. This can be related to their nutritional status. Boys did not have issues of low BP or hypertension, while 6.25% of girls had this issue. These girls are prone to problems related to heart and with time they may experience deterioration in the functioning of immune system. Around 50% of boys had sleeping disorder while only 6.25% of girls had the disorder. This can be due to other activities that they are engaged in along with sedentary life while girls had other activities engaged and hence less of insomnia problems. The analysis of these results is presented in figure 1.

CONCLUSION

Among the collected data, it was observed that 50% of the students consumed only 3 meals per day while 16.6 % of them have 2 meals indicating that they skip breakfast. Around 37% of the students were skipping their breakfast, which has affected their performance at school or college and few of these also have the issues of insomnia. Around 53% of the students had some or the other physical activity and such students no such issues as sleeplessness. Students having a good sleep of 6 to 8 hours have performed well in their academics too and have no such health issues. Girls were found to suffer from health issues like anemia and low BP, while 50% of boys had sleeping disorders. Youth having a good life style and physical activity were found to be good performers while youth having sedentary life and skipped food had health issues and are poor performers. To overcome all these stress-free environment and a good support system at home is required for today's youth to lead a healthy life.

Figure 1: Health issues, sedentary time and food habits analysis

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CHALLENGES IN THE FIELD OF MEDICINE AND DIAGNOSTICS DURING POST COVID ERA

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ABSTRACT

The year 2020, the year of pandemic COVID-19. Human race has been facing many challenges once in every decade, but this time the pandemic has locked the entire world. It halted all activities of the human race, challenging their brains to come up with technologies that can solve the problems of the day and meet the needs of people during lockdown. From a rush to develop vaccines to coming up kits for Rapid detection of devices, many innovative apps have come which enabled people to connect with each other and also helped them do their work. Through this paper, challenges being faced by governments in terms of meeting the infrastructural needs developing diagnostic kits and vaccines will be discussed. Challenges to be faced Andhra Pradesh along with future prospects are also mentioned.

Key words: Corona Virus, COVID-19, Diagnosis of Corona, Vaccines for Corona, Post Covid Era Challenges.

INTRODUCTION:

On December 9th 2019, a novel strain of corona virus was identified in the Wuhan city of China which has caused pneumonia of unknown etiology (1). By 7th of January, 2020, the Chinese Center for Disease Control and Prevention (CDC) has identified the virus which was named as 2019-nCov by WHO (2,3). The com by US common symptoms reported by US Centers for Disease Control and Prevention include- fever, cough, fatigue, shortness of breath and loss of smell and taste (4). WHO and CDC of Europe have released many articles educating people about the spread of disease and prevention measures to be taken (5, 6). Incubation period for the disease is 14 days and some reports say it can be even more (5, 7, 8). Complication associated with the disease include pneumonia to acute respiratory distress syndrome (ARDS), it can lead to neurological issues, loss of motor functions and even pediatric multisystem inflammatory syndrome in children (9 – 11).

The novel corona virus which is the Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), is related to SARS-CoV and was reported to exhibit 96% identity with bat corona virus (BatCoV RaTG13) (12, 13). The virus specifically attacks hosts type II alveolar cells of lungs via Angiotensin converting enzyme 2 (ACE 2), to which binds through its spike (14). People affected with the virus were found to have symptoms of systemic hyper inflammation. They had elevated levels of Interleukins (IL-2, IL-6, IL-7),



GM-CSF, Interferon Gamma, Monocyte and macrophage chemotactic factor along with tumor necrosis factor alpha (15). Classic serum markers identified were increased C-reactive protein, elevation in lactate dehydrogenase enzyme and also ferritin (16). The virus structure, its genome organization, replication and pathogenesis have been extensively studied (17, 18, 14). In this paper, latest techniques on diagnosis of corona virus, vaccine development strategies and future recommendations will be discussed.

DIAGNOSIS OF CORONA VIRUS

The symptoms that the individuals would have if they are infected with corona virus were extensively studied. A report by WHO (19) states that around 87.9% of the people will have fever and 67.7% of the infected people would suffer from dry cough along with other symptoms as shown in figure 1. According to the WHO official dashboard as on 25th May, 2020, the number of COVID-19 confirmed cases are 52,67,419 while the number of deaths are 341,155. Still there are many cases unidentified in the total 200 countries that the virus has conquered. As on the reported date India reports 131868 positive cases, while Andhra Pradesh it is 2823 cases. The Ro value for the disease SARS-CoV-2 or COVID 19 is 2.2 to 2.5 indicating that every individual can infect a minimum of 2 people (20), while in New York it has reached a maximum of 3.4 to 3.8 (20, 21). Here, a quick diagnosis and a fast report generation of COVID 19 infection become important. According to ICMR as on 25th May, 33.3 lakh tests were conducted in India which is just 0.26% of the population.

THE METHODS OF DIAGNOSIS: The available diagnostic methods for COVID 19 are categorized into two types. The first types try to detect the presence of virus while the second type tries to detect for the presence of antibodies. Detection of corona virus infection based on the presence of antigen is mostly being used. The earliest reports were using a nested PCR (22) and today WHO recommends RT PCR and Real time PCR (23).

Reverse Transcriptase PCR: It is used to detect virus RNA. Corona virus has RNA as the genetic material which is converted to DNA and amplified using primers. The nasopharyngeal swabs or oral swabs were used as samples, DNA was isolated and the virus presence was detected. Usage of High throughput Real time RT PCR would give results in few hours to 2-3 days (25).

Isothermal amplification assay: This assay also uses PCR and amplifies virus genome, but is much faster in giving results as it does use those many cycles. It uses fluorescent tags that enable virus detection (24).

Antibody detection methods: Upon contact with antigen, the immune system produced antibodies. It takes 14 days to develop traces of detectable antibodies and post infection after 28 days a peak level of antibody levels are seen in individuals (26). However, presence of antibodies would be an indication that the person has encountered and recovered from the disease and this test result can be used to giving travel passports (27).



As on April 8th, 2020, the Financial Express reports that it is just 1,01,068 tests that were conducted in India because of lack of proper approved testing kits (28), while by second week of May, ICMR increased the capacity to 1 lakh tests per day (29).

VACCINE DEVELOPMENT

Entire world is in the race to develop vaccines and around 15 potential vaccine developers are in pipeline across the globe working on developing a potential vaccine within a year using modified virus, messenger RNA, DNA etc (30-34). Most of them are in the stages of clinical trials. The Coalition for Epidemic Preparedness Innovations (CEPI) announced its funding program for vaccine development and University of Queensland has started working on recombinant DNA and RNA based vaccine development strategies and they aim to go for clinical trials by June, 2020 (35). Though MERS-CoV vaccine is under preclinical trials, a potential usage of SARS-CoV vaccine was proposed due to the similarities between virus and the cross reactivity can be exploited mean while (36).

TECHNOLOGICAL CHALLENGES:

The covid era has already put forth several challenges in the fields of medicine and diagnostics. The advancement in technology were seen during the past two month of lockdown. There was a drastic increase in the medical equipment purchase, manufacture and in-house developments. According to the reports of Center for Disease Diagnostics and Economic Policy reports (CDDEP) as on April 21, 2020, for a highly populated country like India, it is very difficult to meet the needs if not upgraded. For a population of 135.26 crores, there are 19 lakh hospitals with 95000 beds and 48 thousand ventilators. These figures indicate that 1 in a 100 person can be admitted to ICU while 0.0035 individuals out of 100 can be put on ventilators. In Andhra Pradesh we have a total of 928 hospitals which can accommodate just 83,230 beds. They have 4,162 ICUs and 2081 ventilators (37, 38).

The challenge here is to expand these facilities. To face the pandemic, number of hospitals with Intensive care units is to be established. Though the entire world is facing all these challenges, a researcher from AIIMS has developed a mini ventilator called AgVa which is now being manufactured in collaboration with Bharath Electronics limited and manufacture in-house ventilators (39). As per the latest reports, the Andhra Pradesh Government has already started manufacturing 2000 detection kits (based on RT PCR) and also on the way of making indigenous ventilators which would scale up to 5000 units production per month (40). To meet these needs a wide variety of adjoining man power need to be trained, equipped with skills and employed. Figure 2 depicts some of the area that has gained importance in recent days. While WHO says India would achieve this target by 2030 (41).

CONCLUSION

Covid 19 has set a new bench marks for the entire mankind. A small virus whose structure and mode of replication is studied, yet the ways to stop it is still under investigation. During the past one month the major focus of every individual and



government was to understand the lacuna and fill it to face the challenges. Our governments have realized the need to pump funds into vaccines and not just software development. Indigenous goods production and manufacture has increased. We are fit to face any challenge has become our slogan. Increased need to work on medical related fields has been understood. A 1: 1000 ratio for doctor to patients, set by WHO may not be enough during such conditions. It is not just medical field but everyone have been working their own way to face post covid challenges. Mainly the health care related area need to be addressed. It is a challenge as nothing can change overnight. But determination to fund these areas would improve our countries economics. It will not just support that field but the depended fields will also flourish leading to increased employment.

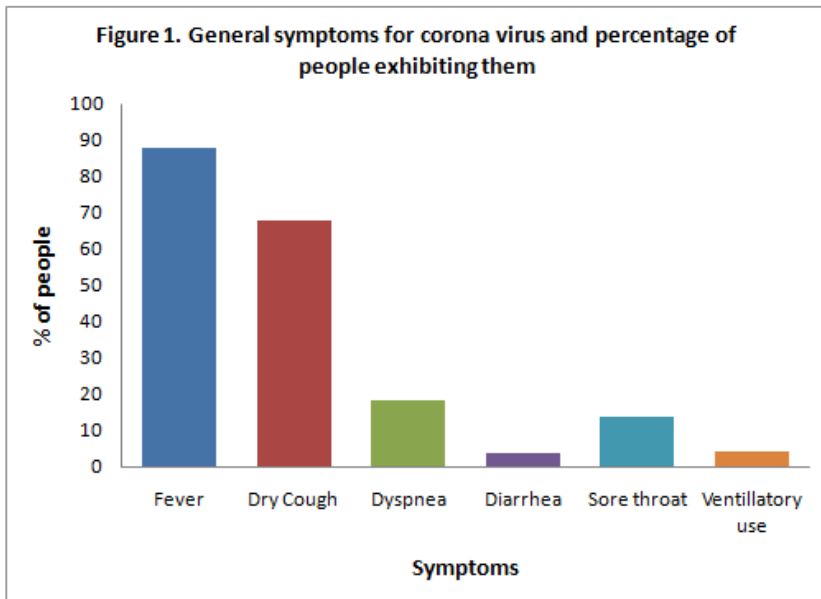
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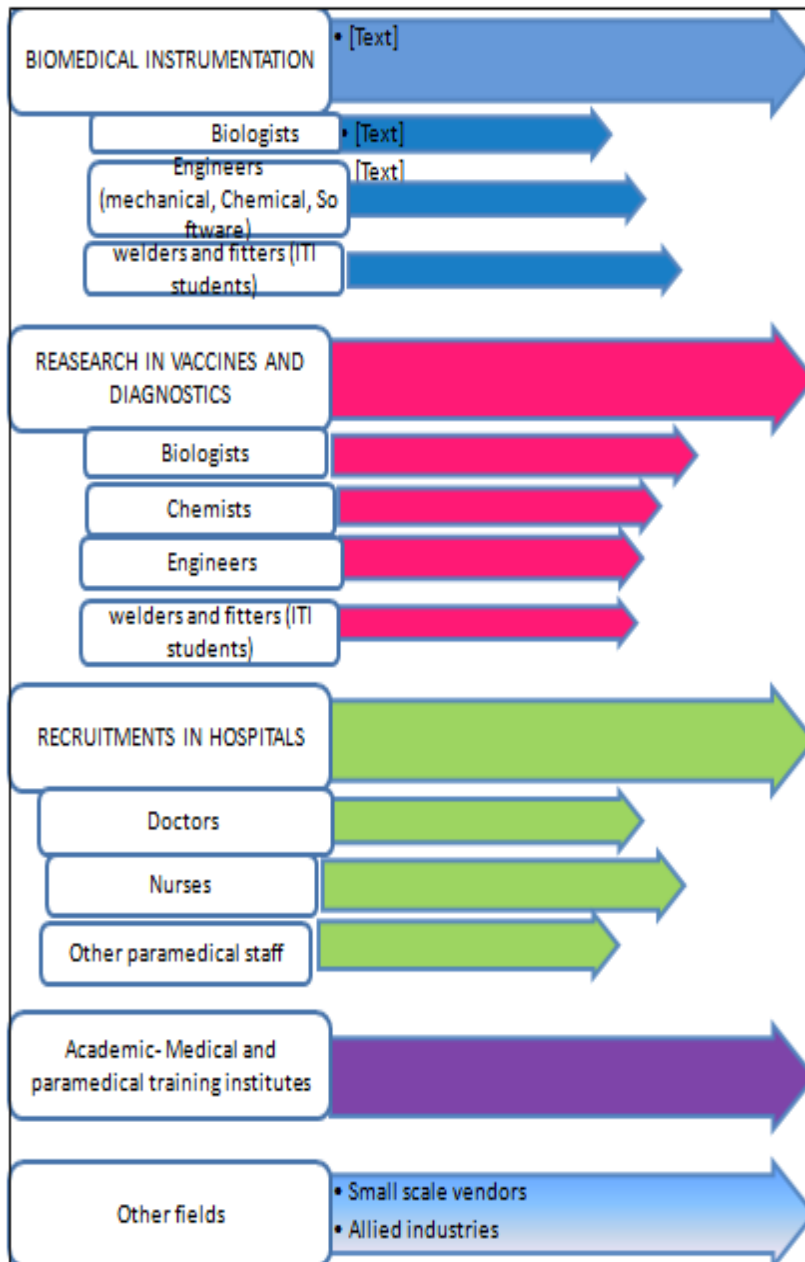


Figure 2: Area that have gained importance during Covid era