

ISSN : 2231-2374

Research Highlights

A Journal of



Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD

Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

Vol. 32, No. 1 | Quarterly | January 2022

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OMICRON - AN EMERGING VARIANT OF CONCERN

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Abstract

Omicron and its uncertain characteristics noticed in its evolutionary life cycle from infection to transmission made it a variant of interest, concern and surveillance in the current pandemic catastrophe. Mutations are an important causative factor due to the significant changes in genetic foot prints. Precautionary practices and vaccination are the important measures needed to fight the problem.

Keywords: Omicron, Spike, mutations, delmicron, endemic

Introduction

Omicron is an emerging SARS-CoV-2 viral variant of concern that lines up with the other evolutionary variants such as Delta, Gamma, Alpha and Beta. On November 25th, 2021, the variant was first identified in South Africa by genome sequencing and numbered as, B.1.1.529. A day after its identification, it was designated as Omicron and mentioned as an important variant of interest (VoI) and concern (VoC) by the World Health Organization (WHO). Hence, the conspicuous variant for many reasons necessitated scientists to characterize and understand its function considering it as a potential future pandemic wave threat. The

identification of Omicron, SARS-CoV-2 variant is considered a new chapter in the COVID-19 variant according to comments by Karim and Karim (2021).

Features of the Omicron variant that were indifferent to other sarbecovirus astonished even the scientific community to think what's next beyond this in COVID-19 evolutions. The epidemic growth observed with Gauteng's R-value of above 2 showed its fast spread rate (<https://www.nature.com/articles/d41586-021-03614-z>). Thus, its warp rate of evolution and transmission with heavy mutational changes mainly made it a VoI and VoC assert Callaway (2021). Besides these, a few other odd and unpredictable novel mutations noticed together with common mutations of SARS-CoV-2 variants raised a presumed third wave alert among the scientific community. Yet another characteristic feature of less detectable asymptomatic presence, irrespective of self-quarantine and vaccine control measures spotted in a few cases reports identified in Hong Kong (Gu *et al.*, 2022) and India, posed further speculation rife about an extraordinary infection potential of the Omicron variant among humans.

Omicron and its Mutation Profile

Omicron, a Variant Under Investigation (VUI-21-NOV-01) as per the United Kingdom Security Agency reports, showed

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the shared mutation profile with amino acid changes that exceeded fifty and which are spread widely in the SARS-CoV-2 protein structure. About thirty two of these changes are noticed in the spike protein, among which thirty are substitution mutations. Out of these thirty substitutions, about fifteen or half of the substitutions are noticed in the human receptor-binding region of the spike glycoprotein in the Omicron variant that starts from G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H.

Most of the experimental and theoretical studies proved these substitution mutations as the most important causative factor for immune escape or reduced therapeutic potential discerned for the existing vaccine jabs. It was argued by Yeh and Contreras, (2021) that directional selection could have been the probable driving force in the omicron variant evolution. Its divergence to ≤ 6 other major sub-groups indifferent to the other SARS-CoV-2 variants identified from the genomic surveillance of 131 Omicron different variants identified from November 9th to 28th, 2021 confirmed frequent occurring mutational sites. The analysis showed that 86.3 per cent of the Omicron variants to bear spike protein insertion at 214th amino acid position (INS214EPE), a significant genetic footprint inference obtained from the different polymorphism statistical tests viz., as DH, Zeng's E and Tajima's D. In specific, Tajima D test also forecasted that unforeseen fast spread could have happened 6 weeks before its identification. Computational docking

studies predicted that the high binding affinity to Human ACE2 (hACE2) receptor is due to the following mutation spots enriched with hydrophobic amino acids leucine and phenylalanine in RBD, (i.e) Q493R, N501Y, S371L, S373P, S375F, Q498R, and T478K.

Topology based Artificial Intelligence (AI) model (TopNetmAb) developed based on well tested (Chen *et al.*, 2021^{a & b}) and deep experimental data comprehensively predicted the Omicron variant to be over ten times more contagious than its original form or maybe twice as infectious as the Delta variant (Chen *et al*^b). The vaccine escape potential was also predicted to be twice as high as that of the delta variant mainly due to Omicron RBD mutations. In specific K417N, E484A and Q493R substitution mutation compromised Eli Lilly's monoclonal antibody (mAb) cocktail whereas substitution mutation at E484A, Q493R and Q498 reduced the efficacy of CelltrionmAb (Regdanvimab) and RBD substitution mutation at E484 messed up the Rockefeller University mAbs (C135 and C144) except for RegeneronmAb cocktail that had a mild impact on the omicron variants. Among all these different RBD-mAb complexes, mutation noticed in common at E484A, K417 and Q493R was identified as the main causative factor for vaccine breakthrough potential of Omicron variant.

Cao and his research team (2021) showed through *in-silico* docking studies that Omicron variant escape over 85 per cent of the SARS-CoV-2 neutralizing antibodies (Nabs) such as LY-CoV016/LY-CoV55553

cocktail, REGN-CoV2 cocktail, AZD1061/ AZD8895 cocktail and BII-196 developed based on the diverse epitope group of (A-D design). Even the neutralizing antibodies (NAbs) such as VIR7831 and DXP-604 were shown to have a reduced efficacy which alerted the scientists to design and develop vaccine design strategies based on conserved regions. A potential immune escape of omicron variant from approved monoclonal antibodies (mAbs) associated with a significant drop in the electrostatic potential energies between RBD and mAbs (Etesevimab, Bamlanivimab and CT-p59) complex was mainly attributable to amino acid substitution changes of T478K, Q493K, Q498R and E484A (Woo & Shah, 2021). Similarly, the three substitution changes in the RBD-Omic-ACE2 computation complex, i.e., T478K, Q493K and Q498R were also reported to increase the rate of infectivity and transmissibility with associated change in binding energies and electrostatic potential doubling up. Moreover, the unique substitution of E484 with A instead of K in Omicron variant is found to be the main or common causative factor for developing the immune evasion or vaccine by-pass mechanism in most of the computational studies that were absent in the other antibody neutralized Beta, Gamma and Mu variants. Confirmation by genomic sequencing is essential for Omicron variants despite antigen diagnosis by kits (<https://www.medtechdive.com/news/fda-update-covid-tests-ail-detect-omicron-variant/611617/>).

Is Omicron becoming an Endemic Variant?

Experts also believe conversely that the Omicron variant of SARS-CoV-2 is shifting itself over time to become an endemic strain with milder illness. Its restricted geographic area located across the global countries raise the transit to endemic paradox. The probable endemicity also raises debatable questions on its continued existence and complete eradication. A Hong Kong research study report not yet published claims Omicron to be less severe in infecting lungs despite their faster spread about 70 times than the Delta variant in human bronchus. If so, then would the omicron variant displace the infectious delta variant, the debatable question requires further extended genomic surveillance studies.

From a positive perspective, some experts consider the transition to endemicity as Darwin law of natural selection as it provides immune protection. However, it remains unclear whether the raised immune protection or milder infection noticed in the Omicron variant is due to either vaccine acquired immunity or prior infection acquired innate immunity or because of Omicron induced antibodies. Recent news reports also debated that omicron could be a probable nature's selection of nature's vaccine that could end the game of devastating COVID-19 disease. The Indian SARS-CoV-2 Genomic Consortia INSACOG is closely tracking the Omicron variant B.1.1.529 and its presence with parliamentary panel recommendations for vaccine evaluation, booster dose research and also has proposed a plan of action for

improved public health infrastructure. The recent high spike of super strain, Delmicron in western countries, a new double variant of Delta and Omicron makes clear that pandemic will not end now and gives alarm bell to understand its characteristics.

How to Tackle Omicron Virus

Fight against the COVID-19 or any of its variants could be navigated as precautionary measure by getting vaccine booster shots for risk age and jobs category in addition to initiation of vaccination among children said Prime Minister Modiji in his short notice address, other than adherence to social distancing and stringent lockdown measures. Also his launch of Saptapadi or seven mantras to manage effectively the COVID-19 virus gave awareness to the entire nation about different tackle measures to be followed by all of us. They are listed below:

- To take special care of the elderly and senior citizen with pre-ailments
- Practicing self precautionary safety hygiene measures, social distancing and following lock down measures
- boosting one's immunity as per the AYUSH guidelines such as drinking warm water throughout the day, practising Yoga, Pranayama and meditation for 30 minutes daily and inclusion of spices like turmeric, cumin, coriander and garlic in cooking, drinking herbal teas, decoctions prepared with basil, cinnamon, black pepper, dry ginger and raisins apart from consuming turmeric-infused milk and

following ayurvedic procedures like application of coconut or sesame oil to the nose and steam inhalation to get rid of dry cough

- Downloading the Arogya Sethu mobile application to assist the government in tracing the COVID-19 affected individuals
- Advised people to provide food and shelter to those who are in need and poor and also has asked to remain compassionate towards colleagues by avoiding job and payment cut-offs
- Show respect to all the health professionals and sanitation workers who are working day and night in field to tackle effectively the problem.

Conclusion

The exponential growth of the omicron variant and its unclear severity and behaviour with increased transmission and less sensitive rapid diagnostics with continuous evolution to double variant of delmicron leads to speculation of continued pandemic challenge. The continued omicron uncertainty emphasizes strengthening the immunity through re-vaccination of the vulnerable or booster jabs across the globe with self-quarantine public health control measures that might effectively manage the possible future threat.

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SOCIAL MEDIA USAGES FOR EDUCATION AMONG THE YOUNGSTERS - AN EMPIRICAL EVIDENCE

* VIMALA, V.

Abstract

Social Media and its advanced technology in India have gained significant attention among youngsters in today's context. The different social media platforms like Facebook, Instagram, Twitter, Pinterest, LinkedIn, Youtube, blog etc, on youngsters are found to have adverse effects on their education system, family life and psychological behaviour. Its marketing strategies increased the website traffic due to the high usage among the youngsters in Tamil Nadu. Social Media Examiner report states that 90 per cent of social marketing increased and the awareness metrics on social media modes indicated that, 2 billion Facebook users, 800 million Instagram, 467 million LinkedIn, 330 million Twitter users and 173 active Snapchat users. In this context, it is anticipated to investigate the effect of social media and its advanced technology on adolescent girls to conquer all the risk factors involved in social media.

Keywords: Social Media Modes, Social Networking Sites, e-Media, Virtual System, Advance Technology

Introduction

In India, social media has to gain distinctive attention and become a vital part of everyone's life. The transformation of social media has strongly affected adolescent girls in recent days with the emergence of a large number social media sites like Whatsapp, Facebook, Twitter, blogs, Instagram, Snapchat, Pinterest, skype and other apps which easily connected the people across the globe. The advanced technology and usage of social media modes allow people to share or exchange information, idea, images, videos and other messages through a specific network. Social media is widely accessible through e-media to facilitate and publish their views to access information. Different modes of social media, channels and its upgraded technology robustly take part in a significant role in the development of youths. Usages of social media affected the lifestyle of youngsters' psychological behaviour, education system and issues of attitude in society.

Social media has widely led to both positive and negative impacts. It has

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become a supportive medium for coverage of wide social movements in a society (Eren-Erdoğan & Ergun, 2017) and as an impact, anti-consumerism has evolved. A case study from the university youths has proved social media to have a positive impact by providing learning and job opportunities (Ali *et al.*, 2016). Contrary to this youngsters spending significant time in Social Network Sites (SNS) are reported to get negatively influenced in their societal norms and values, such as studies and their relations are getting affected. Even their health is affected because of change in their lifestyle with excessive SNS usage (Akram *et al.*, 2015).

SSN also plays an important role as a marketing platform to attract teenagers and young adults and establish a personal fit among them as consumers (Mishra & Tyagi, 2015). Perloff, (2014) in his review has well explained social media and its varied effects on young women's body image concerns and he has also provided deep insight on the theoretical-driven research and its effects of social media on young adult women's body image and self-perception. Steinsbeek *et al.* (2021), suggested that social media network usage for self-oriented use rather than for other oriented use negatively affects appearance and self esteem from childhood to adolescence.

Worldwide debate claims of whether the growing use of social media and screens, among children, are healthy or harmful for their impact has accumulated due to its rapid increase to make alternate measures or controls as required (House of Commons

Science and Technology Select Committee, 2020). The social media usage from blogging to online social networking to the creation of all kinds of digital material is inevitable to many teenagers' lives according to Lenhart *et al.*, (2007).

Social media has a strong effect on the adolescent behavioral health and also has proven that teen's use of social media occurs simultaneously along with their identity development, emerging sexuality, physical development and moral consciousness as per the reports of Eleuteuri *et al.* (2017). Girl children's behaviour and a consequence their well-being are more adversely affected than boys due to increased use of social media network sites McDool *et al.* (2016). The impact of social media (SM) or new media (NM) in our education institutions and society today are undoubtedly overwhelming according to Chukwuere and Chukwuere (2017). The students in the developed and developing countries are getting more addicted to social media and its applications for a variety of reasons that ultimately change their social and personal lifestyle both in academics and non-academics.

The social media impacts from both the positive and negative aspects in various fields of education, business, society, youngsters are broadly discussed in the Indian context by Siddiqui & Singh, (2016). Social media pages have also shown to achieve successful destination branding aid to promote ecotourism in north-eastern Himalayan state (Puja and Amit, 2016). The digital marketing option available through social network sites

has proven to be effective for the marketers with regard to firm's sales and the consumer's for their product choices (Yasmeen *et al.*, 2015). Online Social networks are helpful in the identification of the potential brand ambassadors and thereby increase the return on investment of markets in a seven step process (Kumar & Mirchandani, 2012).

Social media network marketing has proven to be the next generation of business trends to proceed with smart businesses by developing an online network of people (Deepa & Deshmukh, 2013). Effectiveness of social media as a marketing tool and various methods of online marketing strategies through social media and its effective adoption to increase the buying among the customers was studied by Bashar (2005). The research identified that internet as an emergency military communication system, which dominated the social networking sites with eventual outcome in the social behaviour pattern of youth. (Neelamalar & Chitra, 2009).

Enormous studies are available about social media and their effects in various sectors of business, marketing, corporate sectors, industries, military and defense that vary from simple case studies to different state studies, cross-country studies and sector-wise comparison studies. The literature studies carried out on the social media and the effect of its advanced technology among the adolescent girl is very limited and inadequate in India. With the review of a few important works carried out in current study based on the objectives, it is identified that the research

gap exists at present. The review of literature clearly indicates that research undertaken on the area of effect of social media and advance technology on the adolescent girls; particularly in Tamil Nadu state is inadequate. Hence, the study intends to investigate the effect of social media modes, network sites and it's the impact on the youngsters.

The central objectives of the present study was to understand the significance of social media usages and its impact on psychological behaviour, family pattern and social lifestyle to study the challenges and opportunities of social media on youngsters, education system and society. The study was to find the impact of social media on youngsters and its association with education and society.

Methodology

The present study intends to understand and analyse the impact of social media and its advanced technology on adolescent girls of Tamil Nadu. The survey was carried with a well-structured, pre-tested questionnaire among selected youth social media users (n=231) in Tamil Nadu state. The level of the influence or impact of each construct of the social media among the youngsters were coded as ordinal data as with '1' denoting as not at all Influence, 2 denoted as slightly influence, 3 denoted as somewhat influence, 4 denoted as very influencing and 5 denoted to influence extremely. In the present research, suitable statistical tools were used to find out the results on the social media impacts on two major factors such

as education system and society as a whole. Means, standard deviations, correlations and reliability estimates (cronbach alphas) for all the research variables calculated using SPSS statistical Tool.

Results and Discussion

The study made an effort to investigate the consequences of social media application and its advanced technology usage by youngsters. The preferred social media usage with advanced technology by the youngster's had a highest influential impact on the societal values that were presented as six different statements. It is understood from Table 1, that youngsters especially girls have self-reported to get extremely influenced in their societal

values while using social media applications and their advanced technologies.

Each statement concerned with the societal values had varied influential effects among the youngsters whereas the mean societal influential index scores obtained by the overall mean score of the six societal influential corresponding statements of the social media usage by youngsters in the Likert scale of influence were 43.83, 43.50, 39.17, 42.67 and 61.83 respectively. The overall mean score gave a clear representation that social media is negatively influencing the female youngsters in many of their societal values about their personal and social lifestyle leading to unnecessary confusions among them despite its few positive and neutral influential effects.

Table 1. Societal Influence of Social Media Applications Usage by Youngsters

Construct	1	2	3	4	5
Posting of inappropriate and irrelevant, a discriminatory matter, offensive, anti-cultural and religious contents and links promotes abhorrence among ethnic groups in the society	71 (30.74)	65 (28.14)	23 (09.96)	15 (06.49)	57 (24.67)
The uses of social media by adolescent girls disvalue marriage institution in the society	53 (22.94)	42 (18.18)	41 (17.75)	42 (18.18)	53 (22.94)
The use of social media is destructively disturbing personal dealings (social lifestyle)	39 (16.88)	41 (17.75)	52 (22.51)	38 (16.45)	61 (26.41)
The use of social media stimulates immoral and unethical posting of videos, pictures, images among female students	10 (04.33)	29 (12.55)	30 (12.99)	73 (31.60)	89 (38.53)
The use of social media creates unnecessary information and confusion on adolescent girls mind	32 (13.85)	41 (17.75)	41 (17.75)	54 (23.38)	63 (27.27)
The use of social media impact on adolescent girls positively	58 (25.11)	43 (18.61)	48 (20.78)	34 (14.72)	48 (20.78)

Source: Survey Data, 2021, N = 231, [Level of Influence or Impact: 1 - Not at all Influence, 2 - Slightly Influence, 3 - Somewhat Influence, 4 - Very Influence and 5 - Extremely Influence]

Note: The numbers mentioned in the parenthesis () represents the percentages.

Social media has shown to influence extremely the youth from different social lifestyle dimensions starting from their interests to cultural values, beliefs, opinions, behaviours and corresponding orientation both within-group and or as an individual, thoughts and its impact on lifestyle, their social position, and actions or reactions,

associations bound with the norms or rules. The overall mean frequency of the eleven social lifestyle perspective statements in the Likert scale respectively were 35.91, 46.36, 41.82, 45.18, 61.73 depicted the extreme influence of social media usage among the female adolescent respondents (Table 2).

Table 2. Effect of Social Media on Social Lifestyle of Youngsters

Construct	1	2	3	4	5
Remarkable change in the Interest of adolescent girls	33 (14.28)	42 (18.18)	47 (20.35)	51 (22.08)	58 (25.11)
Cultural Change and Shock	26 (11.25)	38 (16.45)	36 (15.58)	58 (25.11)	73 (31.61)
Belief and Value system	14 (06.06)	21 (09.09)	64 (27.71)	68 (29.47)	64 (27.71)
Opinion in life may or may not differ	35 (15.15)	47 (20.35)	42 (18.18)	48 (20.78)	59 (25.54)
Behavioural changes	29 (12.55)	31 (13.42)	43 (18.61)	59 (25.54)	69 (29.87)
Behavioural orientation (group and individual)	47 (20.35)	58 (25.11)	42 (18.18)	33 (14.28)	51 (22.08)
Thought and its impact on lifestyle	36 (15.58)	73 (31.61)	38 (16.45)	26 (11.25)	58 (25.11)
Effect of Social position	64 (27.71)	64 (27.71)	21 (09.09)	14 (06.06)	6 (2.5)
Action	35 (15.15)	47 (20.35)	42 (18.18)	48 (20.78)	59 (25.54)
Associations	47 (20.35)	58 (25.11)	42 (18.18)	33 (14.28)	51 (22.08)
Norms / Rules	29 (12.55)	31 (13.42)	43 (18.61)	59 (25.54)	69 (29.87)

Source: Survey Data, 2021, N = 231, [Level of Influence or Impact: 1 – Not at all Influence, 2 – Slightly Influence, 3 – Somewhat Influence, 4 – Very Influence and 5 - Extremely Influence]

Note: The numbers mentioned in the parenthesis () represents the percentages.

Youngsters surveyed criticized the social media to influence extremely in the destruction of the social values, beliefs, traditions and lifestyle of youngsters with a mean score approximately to about twenty-eight per cent (Table 3). Similarly, survey results also showed social media to

extremely influence or promote borrowing of foreign culture and traditions. Social media's influence among youngsters towards gender inequality was unclear with the respondent's survey results said not to influence at all or extremely influenced with a more or less equal frequency distribution of respondents. Most

of the survey respondents said social media usage is the main reason for the involvement of girls in politics as indicated by twenty-six per cent. Social media extremely influenced the youngsters despite time consumption process to chat, share content, connecting links between peers or other people etc to about thirty-eight per cent. Social media is also said to slightly influence youngsters to fall in love with an observation of about twenty-six per cent. Youngsters also claimed social media usage to extremely influence the

relationships with family, friends and course mates and to extreme levels in certain cases the destruction of inter-country relationships based on the respective response rate of twenty-five and thirty-one per cent. Addictions to social media noticed among the female girls were reported to agree by the majority of the respondents from somewhat influential to extremely influential. The ways youngsters behave to the elders were also noticed to be extremely influenced by the social media they use.

Table 3. Usage of Social Media and its Impact on Youngsters Behaviour

Construct	1	2	3	4	5
The usage of social media destroyed your social values, beliefs, traditions and lifestyle of adolescent girls	14 (06.06)	21 (09.09)	64 (27.71)	68 (29.47)	64 (27.71)
The usage of social media promotes borrowing of foreign culture and traditions	35 (15.15)	47 (20.35)	42 (18.18)	48 (20.78)	59 (25.54)
The usage of social media helps in destroying gender inequality	53 (22.94)	42 (18.18)	41 (17.75)	42 (18.18)	53 (22.94)
The usage of social media encourages adolescent girls to involve in politics	39 (16.88)	41 (17.75)	52 (22.51)	38 (16.45)	61 (26.41)
The usage of social media calling, chatting, sharing contents, linking links and many more is time consuming	10 (04.33)	29 (12.55)	30 (12.99)	73 (31.60)	89 (38.53)
The usage of social media has changed how you feel in falling in love with Non-Indians	42 (18.18)	41 (17.75)	53 (22.94)	42 (18.18)	53 (22.94)
The usage of social media is latest means for you to find love	39 (16.88)	61 (26.41)	41 (17.75)	52 (22.51)	38 (16.45)
The usage of social media has destroyed your relationship with family, friends and course-mates	33 (14.28)	42 (18.18)	47 (20.35)	51 (22.08)	58 (25.11)
The ineffective of use of social media destroys interrelationship between countries	26 (11.25)	38 (16.45)	36 (15.58)	58 (25.11)	73 (31.61)
The usage of social media is becoming addictive to female students	14 (06.06)	21 (09.09)	64 (27.71)	68 (29.47)	64 (27.71)
Social media influence on how you communicate or Address older person	35 (15.15)	47 (20.35)	42 (18.18)	48 (20.78)	59 (25.54)

Source: Survey Data, 2021, N = 231, [Level of Influence or Impact: 1 – Not at all Influence, 2 – Slightly Influence, 3 – Somewhat Influence, 4 – Very Influence and 5 - Extremely Influence]

Note: The numbers mentioned in the parenthesis () represents the percentages.

Social media influence the youth's social lifestyle. Youngsters of the current study reported using social media more equally for entertainment, online shopping purposes to more than twenty-one per cent whereas approximately twenty-one per cent reported using social media for learning opportunities. About thirteen per cent of the female adolescent respondents used

social media to communicate with their friends. Four per cent of the respondents used social media for the purpose to look for advertisements. Approximately ten per cent of the respondents claimed to use social media to find job opportunities whereas more than nine per cent of the youth also reported social media usage to cause health problems (Table 4).

Table 4. Social Media Influence on Social Lifestyle of Youngsters

Description	N
Social media provide learning opportunities	48 (20.78)
People use social media for entertainment	49 (21.21)
Social media provide opportunity to find job	23 (9.96)
Too much use of social media causes health problem	21 (9.09)
Social media use for communication with friends	31 (13.42)
Social media use for advertisement	10 (4.33)
Social media use for online shopping	49 (21.21)
Total	231 (100)

Source: Survey Data, 2021, N = 231

Note: The numbers mentioned in the parenthesis () represents the percentages.

From the current survey, it was identified from Table 5, that among the different social media applications used by the youngster's text messaging was more (27 %) and for which the cell phone feature was used predominantly to about thirty-one per cent. Among the different social network sites, Facebook was preferentially used by

the youngsters to about approximately twenty per cent. Similarly, for the online video sites, YouTube was used to about twenty-six per cent and for online gaming, Second life.com was used to about more than twelve per cent and for the blogging social network sites, the MySpace feature was used to about approximately nine per cent level.

Table 5. Adolescent Girls and their Social Media Usages

Social media usages	N	Social media usages	N
Text messaging	63 (27.27)	Cell phone feature	72 (31.17)
Social networking sites	59 (25.54)	Facebook	48 (20.78)
Online video sites	48 (20.78)	YouTube.com	61 (26.41)
Online gaming	30 (12.98)	Secondlife.com	30 (12.98)
Blogging within social networking sites	31 (13.42)	MySpace feature	20 (8.66)
Total	231 (100%)	Total	231 (100%)

Source: Survey Data, 2021, N = 231

Note: The numbers mentioned in the parenthesis () represents the percentages.

Youngsters use social media for various purposes. It may be for education or societal purposes. As per the representation from Table 6, it could be understood that twelve per cent of the adolescent girls reported its usage for learning, teaching and chatting mode of educational purposes. Twenty per cent reported its usage for mailing purposes, whereas fourteen per cent reported using social media for surfing the education content. They also were found to use Facebook, to about ten per cent, LinkedIn to about 5 per cent, Pinterest to about more than 5 per cent, Instagram to about three per cent,

Twitter to about seven per cent and other social networking sites to about eight per cent. As part of the societal purpose of social media, the respondents used social media for connecting to their friends to about twenty-four per cent. They also used social media to about nineteen per cent to share their photos and to easily access others profiles to about approximately seventeen per cent. They also used social media for various other minor societal purposes that included testimonial showcases, information sharing, talent advertisements, current affairs exposure or community connections.

Table 6. Purpose of Internet Usage and its Activities in Social Networking Sites (SNS) by Youngsters

Social media on education	N	Social media in the society	N
User learning and teaching	28 (12.12)	Profile setting	12 (05.19)
Mail	48 (20.78)	Communities	10 (04.33)
Surfing	32 (13.85)	Photo sharing	45 (19.48)
Chatting	28 (12.12)	Scraps	05 (02.16)
Facebook	24 (10.39)	Friends network	56 (24.24)
Linkedin	11 (04.76)	Easy access of others profile	39 (16.88)
Pinterest	12 (05.19)	Testimonial	22 (09.52)
Instagram	09 (03.89)	Sharing information	16 (06.93)
Twitter	18 (07.79)	Advertising their talents	12 (05.19)
Social networking	16 (06.93)	Exposure of their current affairs	11 (04.76)
Others	05 (02.16)	Others	03 (01.29)
Total	231 (100%)	Total	231 (100%)

Source: Survey Data, 2021, N = 231

Note: The numbers mentioned in the parenthesis () represents the percentages.

Youngsters mostly preferred using cell phone features the foremost among the different social media applications (Table 7). The significant correlation at 0.1 percent level and the reliable coefficient values between

0.8 to 0.9 for cell phone feature, blogging within social network sites, myspace features, facebook and youtube shows the evidence of the most commonly used social media apps by the youngsters.

Table 7. Means, Standard Deviations, Correlations and Reliability Estimates for Study Variables [Youngsters and the Various Sources of Social Media Applications]

Variables	M	SD	1	2	3	4	5	6	7	8	9
Text messaging	0.66	0.59	--								
Social networking sites	36.23	14.11	.19*	--							
Online video sites	4.16	0.97	.03	.19*	--						
Online gaming	1.86	1.56	-.06	.38	.16*	--					
Blogging within social networking sites	3.73	1.79	-.06	-.18	.07	.04	.93				
Cell phone feature	4.12	0.79	.26***	-.11	.03	-.04	.43***	.97			
Facebook,	2.62	0.86	.09	-.32***	-.00	.00	.44***	.31***	.91		
YouTube.com	2.42	0.69	-.06	-.29***	-.00	-.03	.31***	.26***	.43***	.82	
My Space feature	3.45	0.79	.01	.09	.19	.21**	.59***	.32***	.41***	.19*	.85

Note: N = 231; reliability coefficients appear in bold.

*p<0.05, **p<0.01, p<0.001***

Youngster's also use social media apps for education purposes in the dimension of learning and teaching are represented in Table 8. Twitter, Facebook, LinkedIn, Instagram and Pinterest were the

predominantly used apps by the youngsters for educational purposes as indicated by their corresponding means, the significant correlation at 0.01 per cent level with usage reliability coefficient value from 0.7 to 0.09.

Table 8. Means, Standard Deviations, Correlations and Reliability Estimates for Study Variables [Social Media on Education]

Variables	M	SD	1	2	3	4	5	6	7	8	9
User learning and teaching	0.69	0.72	--								
Mail	33.26	13.21	.22*	--							
Surfing	4.15	0.96	.04	.19*	--						
Chatting	1.88	1.53	-.05	.45	.26*	--					
Facebook	3.76	1.81	-.08	-.19	.08	.09	.91				
LinkedIn	3.26	0.89	.23***	-.13	.04	-.03	.48***	.89			
Pinterest	2.68	0.76	.07	-.29***	-.00	.00	.41***	.29***	.79		
Instagram	2.46	0.82	-.08	-.29***	-.00	-.03	.49***	.39***	.28***	.86	
Twitter	3.77	0.91	.01	.08	.14	.18**	.56***	.46***	.42***	.14*	.91

Note: N = 231; reliability coefficients appear in bold.

*p<0.05, **p<0.01, p<0.001***

Social Media is also used by the youngsters to connect socially with their societal peers for various other purposes of show casting their profile, talents, to connect with their friends and share of information for their increased job opportunities so and so forth. Table 9 depicts the youngsters and their

details about social connections for various purposes. It was found that community connection with friends, for profiles, testimonials, information share and talent advertisements were found to be significant at 0.01 per cent level with a good reliability coefficient value from 0.8 to 0.9.

Table 9. Means, Standard Deviations, Correlations and Reliability Estimates for Study Variables [Social Media in the Society]

Variables	M	SD	1	2	3	4	5	6	7	8	9
Surfing	4.15	0.96	.04	.19*	--						
Profile setting	0.73	0.69	--								
Communities	44.22	18.00	.20*	--							
Photo sharing	3.12	0.91	.01	.19*	--						
Scraps	1.88	1.53	-.05	.36	.26*	--					
Friends network	3.76	1.81	-.08	-.19	.08	.09	.96				
Easy access of others profile	3.11	0.86	.23***	-.13	.04	-.02	.48***	.98			
Testimonial	2.62	0.79	.07	-.29***	-.00	.00	.41***	.29***	.86		
Sharing information	2.42	0.85	-.08	-.29***	-.00	-.03	.42***	.29***	.48***	.90	
Advertising their talents	3.49	0.86	.01	.08	.14	.18**	.51***	.26***	.29***	.14*	.89

Note: N = 231; reliability coefficients appear in bold.

*p<0.05, **p<0.01, p<0.001***

Summary and Conclusion

The present study concluded that majority of the youngsters because of the social media usage has got affected or influenced in their social behaviour, lifestyles and education system as below:

- The use of social media encourages dishonest and unethical posting of videos, pictures, images among young students in the current scenario

- Outstanding change in the concentration of youngsters and behavioural orientation (group and individual) is very high
- The habit of social media calling, chatting, sharing content, linking links and many more is time overwhelming among the select youngsters
- Use social media is very for entertainment and online shopping
- Cell phone features and Social networking sites are more popular among the youngest.

To sum up, the present study has brought out the consequences of social media and its advanced technology on the youngsters of Tamil Nadu. The research revealed the effect of social media on the education system, social impact and remarkable change in society, psychological behaviour, health hazards, and revolution in the lifestyle of youth.

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FOOD-GENOME INTERFACE IN TREATING DISEASES

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Abstract

Foods are a bridge to connect genetic makeup of the living systems. The study of the food and its effect on gene and their networks are referred to as nutrigenomics. The Nutrigenetics era began in 18th Century and flourished to great levels during 20th and 21st centuries. In the 21st century, the era of post genomics, mile stone achievements in Human genome publications and High-throughput ‘omic’ technologies made nutrigenomics concept to scale to great heights. Further, system biology top-down and bottom-up approach made the screening for disease and their prevention possible at early stage with faster development of functional foods.

Keywords : food, genome, diseases, omic, nutrigenomics

Introduction

The food-genome continuous communication can lead to a mnemonic bug or debug genome health codes. Either nutrient deficit or excess may lead to different gene modulation that mediates protection, prevention or modulation of disease. Comprehending the food-genome interface via nutrigenomics, personalized nutrition studies are essential to treat many lifestyle diseases such as diabetes, obesity, cancer so on and so forth. The food in any form fresh or cooked is broken down ultimately into its nutrient components that ensemble and

influences our genes and proteins. Food and genome interface.”

Food-Genome Interface - A Concept Drift from Nutrition to Nutrigenomics

Food and genome interface though a new concept of olden days paradigm of Greek physician, Hippocrates, statement “Leave your drugs in the chemist’s pot if you can heal your patient with food.”

In the World’s history, it could be postulated from the review of Sales *et al.* (2014) that the concept of food-genome interface began in hippocrates period (440 BC) succeeded by the discovery of oxygen, by Lavoisier in the 18th Century (1783-1791) and proceeded to further in the 19th century with the discovery of how various food and nutrients are oxidized to synthesizes energy by the father of organic Chemistry, Baron Justus von Liebig. These two era’s were henced named as Chemical and Analytical Era. Later in the 20th Century or the biological era a tremendous period of development during which the major macronutrients and biomolecules were identified and characterized research studies on intermediary metabolism of foods begin to take shape and in the 21st century, the Post-Genomic Era, integration at three different levels happened viz., biological, social and environmental, a period of leap in the scientific discoveries of Nutrigenomics from the concept of Nutrition and dietetics (Table 1).

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Table 1. Food-Genome Interface – A Concept Drift from Nutrition to Nutrigenomics

Period	Year	Discoverer/ Inventor	Food Genome Interface Discoveries / Inventions
Pre Historic Period	400 BC	Hippocrates	Food as a Healing agent
Chemical & Analytical Era			
18 th Century	1783	Lavoisier	Oxygen
Biological Era			
19 th Century	1800s'	Baron Justus Von Liebig	Food, Nutrient oxidation to energy
	1869	Friedrich Meischer	DNA Isolation
Genomic Era			
20 th Century	1953	James Watson and Francis Crick	DNA Double Helix
	1989	Dr Stephen DeFelice	Nutraceutical Word was Coined
Post Genomics Era			
21 st Century	2001	Pelgrin	Nutrigenomics word was coined
	2003	Establishment of US Nutrigenomic Centre, as per Economist Report	Centre of Excellence For Nutritional Genomics, University of California
	2003	Human Genome Published	The Science of Nutrigenomics began

The dawn of personalized nutrition happened in the post-genomic era with the establishment of new *in-vitro* lower eukaryotic and *in-vivo* animal models with the emergence of new technologies namely Nutritional System Biology and Metabolic Typing (Panaigotu *et al.*, (2009); Sathyamurthy *et al.*, (2021). Nutritional System Biology refers to the usage of system to understand how the nutrients could possibly influence the various human metabolic pathways and have an impact on the homeostasis with up or down regulation of diet-disease related genes and more specifically how it differs specifically for each individual genotype. Metabolic typing means the pattern of metabolites or the macromolecules present in each individual and how it could vary with their individuals eating pattern. Even the state of fasting is reported to alter the catabolic metabolites. The study in fasting human volunteers have

identified about hundred new metabolites in blood and urine besides the common non-esterified fatty acids, glycerol and ketone bodies as catabolic metabolome during an Oral Glucose Tolerance Test (Rubio-Aliaga *et al.*, 2011).

An important milestone achievement in the food-genome interface may be attributed to the completion of human genome project (Nedaeinia *et al.*, 2022). The Human Genome Project began in 1990 to understand the genetic inheritance to identify each of the nucleotides in DNA that got completely published in 2003. It comprised of cataloging the number of genes that make up the human DNA. Identifying the protein products and functions of these genes, associating variation in genes to specific diseases further led to understanding of the complex interactions between genes, proteins and environmental

factors and their manifestation as disease and how difference in genes and their concerned metabolites reflection as a biomarker could be useful in monitoring various disease and its progression.

In general, any nutrient imbalance is proportionate to the onset of diseases. The wonder of disease susceptibility varies among individuals despite having the same level of nutrition. This necessitates understanding the probable factor in their different levels of disease susceptibility. The Human genome publication stated that most differences in varied disease susceptibility are mainly due to 0.1% of genetic variation called Short Nucleotide Polymorphisms (SNPs) pronounced as snips that occur in approximately 1.4 million locations in Humans. SNPs are the DNA sequence variations that occur commonly in population and which denotes a single nucleotide difference in the genome between members of a biological species of a paired chromosome.

High Throughput sequencing 'omic' Technologies & Food-Genome Research

The High throughput (HTS) 'omic' technologies and their inventions created a remarkable milestone in the revolution of Nutrigenomic Research. These HTS omic techs are aids to detect the sequence of biological molecules at genome transcriptome, proteome and metabolome levels. The tens of thousands of SNPs, deoxyribonucleic acid variants and copy number variants, ribonucleic acid molecules and protein molecules are sequenced using these Techs'. Based on the period of development,

the sequencing techniques are classified as First Generation (Sangers' Capillary Based Sequencing); Second Generation (Whole Genome Sequencing (WGS) & Next Generation Sequencing (NGS)); and third-generation that include a single DNA molecule sequencing (Eg. Nanopore Sequencer). The integration of system biology into nutrigenetics with the top-down and bottom-up approach has further elevated the nutrigenomics research to a higher level of personalized nutrition and therapy.

Food-Genome Interactions and its Different Study Types

The food genome interactions broadly may be categorized into three types as direct, epigenetic and genetic nutrient interactions. A nutrient on interaction with receptor behaves as a regulator of transcription factor directly activating the gene expression is called direct interaction. In the epigenetic interactions, nutrients alter the DNA structure and in genetic interactions, nutrients binding to different SNPs thereby modulating the gene expression.

Nutrigenomics studies have concluded with four basic tenets which are 1) Improper diets as risk factors for disease 2) The degree to which the diet influences the balance between healthy and disease states is mainly dependant on the individual's genetic makeup 3) Moreover, the dietary reactive chemicals alter the gene expression and or alter the genome structure and 4) diet regulated genes are likely to modulate the onset, incidence, progression and /or severity of the chronic diseases. Thus, food and

nutrients comprehensively called diet plays a major role in genetic switch on and off of disease susceptibility. Hence, understanding of different types of diets and how they could progress further mankind has consumed during these years. It can be classified as 1. Ancient Diet, 2. Present Day Diet, 3. Future DNA, 4. Future Diet of Personalized therapy.

Ancient, Present and Future Diets

Food acts as a powerful key to reverse DNA damage at genetic level. Thus food in diet form could impact genetic codes and alter the disease specific genetic markers. Mapping of beneficial and detrimental foods specific to each individual's genes is not new to India as it is in existence from vedic times (Asthana *et al.*, 2018) though in a different context of relativity to individual specific wholesome tri-doshas (*vata pitta or kapha*) instead of direct link to genes and its network (Sharma and Wallace, 2020). Hence, the same concept is projected in a new way of understanding to recent developments in technologies and concepts. The food likes and dislikes of an individual are influenced by their specific genetic variations. Many of the trendy "fad diets" experimented have proven to be harmful to health in long time.

Satvik vegetarian based foods are classified as excellent source for triggering beneficial genes of mind, body and soul (Patwardhan & Paranthaman, 2021) Thus food and its nutrient components interactions happen in multitude of different regulatory ways with macro, micro and naturally occurring bio-reactive chemicals or phytochemicals. Nutrients and bioactive

compounds are involved in maintaining the homeostasis of metabolic reactions like hormonal balance, immune competence to detoxify and utilize macronutrient for fuel and growth. The understanding of the genome-protective nutrients in individuals with specific gene variants could potentially result in improved resistance towards major disease. The transition in traditional plant rich diet with fibre to recent days of foods enriched with refined carbohydrate has been identified in genetic studies as the causative factor for sky rocketing increase in the lifestyle diseases such as diabetes, obesity and cancer or various other civilization diseases (Mead, 2007).

The major macronutrient carbohydrate has peculiar impact on the gene expression. Carbohydrate in the presence of insulin, induces genes expression of glucose transporters, glycolytic and lipogenic enzymes, eg. acetyl-CoA carboxylase (ACC). Besides insulin and glucagon being critical gene regulator, Glucose by itself play a key role in transcriptional regulation. Yet another macronutrient, protein is essential for growth, immunity and normal maintenance of body function and structure apart from reproduction and production. The function of protein in body is not only at macro level but is also at micro gene function level. The dietary protein influences responses from a variety or number of genes responds to both protein quantity as well as quality which influence gene expression. Jump & Clark (1999) showed dietary fat to influence an adaptive responsive change based on the quantity and

the type of fat ingested. Especially the fatty acids were shown to stimulate the expression of adipocyte fatty acid binding protein (ap2) in mRNA.

Studies showed that micronutrients such as bivalent metals strongly influence gene expression. Oral intake of Zinc has been shown to enhance the transcription rate of the metallothionein gene in intestinal tissue (Shay and Cousins, 2018). Bivalent metals tend to prolong the half-life of MT m RNA in hepatocytes. Thus micronutrient deficient diet predispose people to toxicity from nonessential metals such as cadmium (Peraza *et al.* (1998). Similarly, micronutrients especially vitamins, biotin, essential proteins and enzymes were proven to be critical in the synthesis of many other metabolites at the gene level. Water Soluble vitamin C is shown to influence hepatic gene expression. Vitamin A in the form of retinol and retinoic acid is shown to have a regulatory function at the gene level. The most important target tissue studied for the effect of vitamins on genes includes target tissues such as adrenal glands, testes, cerebellum, kidneys, prostate, cerebral cortex, skin and the viscera.

Nutriepigenomics is an allied branch of nutrigenomics. It mainly focuses on how the food nutrients have varied effects while epigenetic modification happens or vice the versa. Mainly gestation and lactation nutrition imbalances that are linked to non-communicable disease, such as obesity, cardiovascular disease, diabetes, hypertension and cancer are categorized as nutrigenomics changes. Personalized

Nutrition is how an individual characteristics could have an varied effect on food-genome interface. Understanding the complex food genome link through nutrigenomics and its allied multidisciplinary gene based studies are essential to treat many life-style diseases such as diabetes, obesity, cancer so on and so forth.

The information about the individual characteristics are collected to develop different Personalized Nutritional Therapies (PNT) of targeted nutritional advice, products, or services (Ordovas *et al.*, 2018). There is no agreed definition for personalized nutrition, however it partially overlaps with related terms such as PNT, nutrigenomics, nutrigenetics, nutritional genomics etc., (Adams *et al.*, 2020). An hypothetical precision plate comprise of dietary habits, food behaviour and physical activity that is within the individual's external factors and on the other hand the counterbalanced internal nutrigenomics, microbiota, metabolomics and deep phenotyping (Toro-Martin *et al.*, 2017).

Personalized nutrients and their influence in the prevention of potential disease at gene levels are reviewed extensively in the reports of Neeha and Kinth (2013). The common micronutrients, folic Acid and vitamin B12 involves in chromosome break, hampers DNA repair / methylation. It also prevents Cancer, CVD, Brain Dysfunction, Male Infertility, Leukaemia. Vitamin E prevents Colon Cancer, CVD and Immune Dysfunction. The B vitamin Niacin hampers DNA repair and

prevents nerve problem and memory loss. Vitamin D is proven to prevent gene variation in several types of cancer like colon/breast/prostate cancer, whereas the mineral, zinc involves in chromosome break and prevents brain & immune dysfunction, The fatty acids, flavonoids and proteins alter gene expression for health maintenance and prevention from several diseases and disorders. Vitamin A takes part in repression of PEPCK Gene, aids in termination of pregnancy & fetal death. Protein plays an important role in gene alteration and thereby aids in management of malnutrition disease such as kwashiorkor and marasmus. Thus formulation of DNA diet or personalized nutrition is essential for the future world to prevent plausible disease limited to nutrigenomics approach however, is also possible through nutriepigenomics and personalized nutrition.

Nutrigenomics and its Diversified Implications

Apart from the food and genome interaction, nutrigenomics have diversified implications in various other sectors of health and food sector such as health care, food safety, food security, food borne diseases and agriculture.

Health Sector

With the advent of high throughput *omics* technologies the role of nutrition and health care is profoundly changing into next level (Kussmann *et al.*, 2007) with invent of genome-based improved diagnostics, more effective therapeutic strategies, evidence-based approach research with study models for demonstrating clinical efficacy and better decision-making

tools for patients and providers. Tailored treatments are now a days available to a patient's particular genomic makeup (Bush *et al.*, 2020).

Food Safety

Whole-genome sequencing (WGS) is a comprehensive method for analyzing the entire genomes. WGS is used by food regulatory and public health agencies for detection, investigation and control of food-borne bacterial outbreaks, food regulatory and other activities in support of food safety. Faster and more efficient decision making is possible with the preparedness and response to food-borne infections (Brown *et al.*, 2019). Several World organizations such as Centers for Disease Control & Prevention (CDC), the Food and Drug Administration (FDA), the United States Department of Agriculture's Food Safety and Inspection Service (USDA/FSIS) utilizes the WGS technology for food safety and health care. The FDA's Center for Food Safety and Applied Nutrition (CFSAN) was established in 2013. A GenomeTrakr WGS Network first integrated network of state and federal laboratories was set-up to use WGS to track the global food-borne pathogens.

Food Security

With the increasing World Population that might exceed nine billion by 2050 (i.e) about 34 % (Rodríguez-Herrera *et al.*, 2022), healthy food and nutrients albeit being the beneficial gene trigger could also become modulators of disease in case of toxicity due to pathogen and pests. These could be avoided through sequencing techniques

of the germplasm by ensuring food safety and security on long term usage. Even allergenicity and toxicity of crop products requires consideration before consumption that could be avoided using germ plasm screening for hypoallergenic beneficial crops. Thus Nutritional Security is also ensured through nutrigenetic “*omics*” technologies. The global feeding is a scientific, logistical and humanitarian enterprise and a huge challenge that involves a lot of combined effort that begins with farmers, breeders and extending further to policy makers i.e., governments and genomics work at the base level.

Prevention of Food Borne Diseases

Whole Genome Sequencing provides detailed genetic information about germs that make people sick. Centre for Disease Control and Prevention Division of Food borne, Water borne, and Environmental Diseases (CDC-DFWED) uses this information to improve efforts to find, investigate and prevent illnesses caused by bacteria, fungi, and parasites. This is especially important when looking for the source of an outbreak or predicting drug resistance in bacteria and fungi. WGS provides highly detailed and timely information that helps CDC and other government agencies protect the public's health.

WGS data helps in shaping out the governmental food safety policies and food industry practices by providing safer foods for human lives. The Federal Government

Agencies of United States namely CDC and FDA (Food and Drug Administration) use whole genome sequencing to detect and investigate food-borne disease outbreaks through their corresponding two networks viz., PulseNet and the GenomeTrakr. The PulseNet is a laboratory network managed by CDC; it focuses on the WGS disease cluster data obtained from the bacterial DNA Fingerprints of sick people that might lead to possible outbreak. GenomeTrakr Network is actually the first data repository formed from the geographically distributed laboratory network to utilize WGS technology to identify the plant pathogen. Its a database of food-borne bacteria managed by FDA; it also focus on germs from the environment.

Nutrigenomics and the Near Future

The food production industry have started to use WGS findings to resolve the issue of transient pathogens as powerful tracking tools to trace sources of contamination, as part of environmental monitoring requirements. As WGS profiles clearly discriminates the unique or unrelated, resident and closely related isolates states Brown *et al.* (2019). It is this use of WGS that may have the biggest impact on food safety and public health in the future by significantly reducing the number of contaminated products from entering the market. WGS provides information beyond the identity and relationship of strains; i.e. bacterial genotype. It can be of great help to public health by improving the safety, quality and shelf life of foods.

Conclusion

The relationship between the human genome, nutrition, diet and health across different periods in different contexts are established facts. The new advancements in science and technology opens avenues to understand and realize the interrelationship between food and genome interface. As the popular saying goes genetics loads the gun but environment pulls the trigger. The

three factors namely age, genetic makeup and environmental exposure modulates the diseases. Among the three factors age and genes is beyond our control however, environmental exposure is not so hence, awareness and responsibility towards our lifestyle could prevent most of the lifestyle diseases. Right food in right amounts during all times is the healthy way of life.

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HERBAL FINISHED WELLNESS PILLOW CASE FOR INSOMNIA DISORDER PEOPLE

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Abstract

The basic need of man-kind after food is clothing. Clothing has been selected mostly based on its decorative aspects but it has much important functional properties like protection from hostile environment and micro organisms etc. Clothing plays a crucial role in every culture; besides protecting humans from a hostile environment. In the olden days, our forefathers were curing ailments by wrapping herbal treated cotton fabric on the wounded area. This thought has given me a spark to do research work in this aspect. In today's busy world, many people suffer from socio and work-related depression that leads to insomnia or become the cause of many health problems for people of all age groups. Insomnia is a sleep disorder that causes various life-threatening problems. This research study focused on making wellness pillow covers treated with herbs to heal insomnia disorder. It is a small effort to retrieve our traditional curative textiles method. In this technological world, people are recently following our tradition and focusing on living physically and mentally

healthy. This awareness brings scope for the curative or wellness textiles among the public and thus promotes a new business line.

Keywords: Stress, Pillowcase, Wellness, Curative

Introduction

Sleep is an essential activity for human beings. Quality sleep is crucial for biological functions such as neural growth, learning and memory, emotional regulation, cardiovascular, metabolic function, cell detoxification. In recent day's people suffer from depression related to work and social conditions. These depressions are the main cause of mental stress and thus create many health issues among people. Latest research studies describe that people suffer from a common disease called *Insomnia* disorder mainly due to mental stress.

Insomnia is the difficulty in starting or maintaining sleep, or waking up early in the morning, associated with impaired daytime activities, for example, low cognitive performance, fatigue or mood disturbances.

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It can occur as acute or chronic sleeping disorder that may belong lasting or for shorter duration. Insomnia is a chronic disorder that occurs because of non-sleep for about three nights a week or for three months or more. Insomnia can affect our mental and physical health and cause many risks and side effects that can affect our ability to function.

Risks and side effects of insomnia include a decrease in peoples' work performance and students' academic performance. It might also lead to increased accidents during work time or riding vehicles or may also increase the risk of chronic medical conditions such as heart disease, stroke and obesity. The majority of the middle-aged working professionals in middle-level management are prone to stress-related insomnia or sleeping disorder as per study reports. According to the Medical world, allopathic drugs prescribed for insomnia has potential side effects like constipation or diarrhoea, dry mouth, headaches, muscle weakness and digestive problems such as gas, heartburn and nausea. Nano-emulsive herbal finished advanced cotton textile with improved functional properties of hygiene and antimicrobial effects is found to be effective in studies (Venkatraman *et al.*, 2021).

Ocimum tenuiflorum (Tulasi), *Mentha Sp.*, and *Eucalyptus Sp.* cited in Ayurveda text books for their medicinal property (Tirtha, 1998) were chosen for the preparation of customized herbal wellness pillow as an aid for insomnia condition. Hence, the main aim of this research work was to make a novel

customized pillowcase as a non-invasive, conservative and herbal based curative aid for insomnia disordered middle aged working population.

Methodology

Customized herbal Wellness Pillow Preparation

Exclusive wellness cotton pillowcase was customized and finished within a herbal leaf extracts composite prepared from *Ocimum tenuiflorum* (holy basil) or tulsi, *Mentha Sp.*, and *Eucalyptus Sp.*, These customized pillow covers were given to the selected working professionals (n=20) to evaluate its efficacy in treating insomnia respondents based on their self reporting personal experience of the products.

Preparation of Herbal Wellness Pillow

Tulsi

Ocimum tenuiflorum commonly known as Tulsi has been used in Ayurveda (Tirtha, 1998) for thousands of years for its various healing properties. Tulsi leaves (Fig. 1A) are considered an anti-stress agent. Recent studies show that the leaves provide significant protection from stress. Even healthy people can chew 12 tulsi leaves twice a day to prevent stress (Mohan *et al.*, 2011). The unique medicinal properties of tulsi have inspired us to use this herb for this research work.

Mint Sp.,

Mentha, commonly known as mint (Fig.1B), has been used in traditional medicine for many years to treat a variety

of ailments. The inhalation of mint essential oils have proven to improve brain function. Studies have shown that the aroma of mint can stimulate alertness and help combat fatigue (Ali *et al.*, 2015). Research also claims the scent of mint to elevate the mood of human beings. These exclusive properties have stirred us to use this herb.

Eucalyptus Sp.,

Eucalyptus (Fig.1C), a tree family native to Australia and other subtropical regions, is a powerful source of oil that comes with many medicinal properties. Numerous studies suggest that the steam from eucalyptus has a natural cooling effect that relieves depression. It is a natural remedy for insomnia. The powerful compounds in this oil include A-phenin, B-phenin and limonene, all of which are known to calm the mind and cleanse the bloodstream to the brain. This uniqueness of the herb prompted us to use it for this research purpose.

Cotton Fabric

Cotton is one of the most common fabrics found in home furnishing. It is hypoallergenic (i.e) prevents anyone from getting itchy. Cotton fabric with other natural herbal finish has proven to have antibacterial effect (Zaghloul *et al.*, 2017; Satanarayanan *et al.*, 2010). Cotton fabric were is user friendly which is comfortable, light weight and heat resistant. 165 GSM cotton woven fabric was selected to make the pillowcase according to BIS specification (IS: 745: 2003).

Extraction of Herbal Solution

Fresh leaves of tulsi, mint and eucalyptus were collected from nearby areas. Each leaf was first cleaned using distilled water to remove dust and other foreign matter. Next, these leaves were carefully dried in the shade to preserve the medicinal properties of the herbs. These dried leaves were then powdered using a mixer grinder. Finally, these powders were filtered using a thin muslin cloth to obtain a fine powder (Fig.1D-F)

For the study, the infusion method of Soxhlet Extraction had been adopted. The powdered herbs of Mint leaf were filled in the thimble and placed in the soxhlet extractor. The extractor had been filled with a solvent solution of methanol at a temperature of 60°C extraction period of 6 hours. Similarly, the soxhlet extraction was carried out for eucalyptus and tulsi powder separately.

Using all three extracts a herbal composite was prepared. The detailed procedure is as follows. During the composite preparation process, the mint extract was kept under stirring conditions using a magnetic stirrer (110 rpm, 40°C). Later eucalyptus extract was added drop-wise to the mint extract at the rate of 10ml per minute. Followed by tulsi extract which was added drop-wise onto the mint and eucalyptus extract at the rate of 20ml per minute. The magnetic stirring condition was kept constant for at least 2 hours to complete the composite formation. The final herbal composite was used to finish the semi bleached fabric.

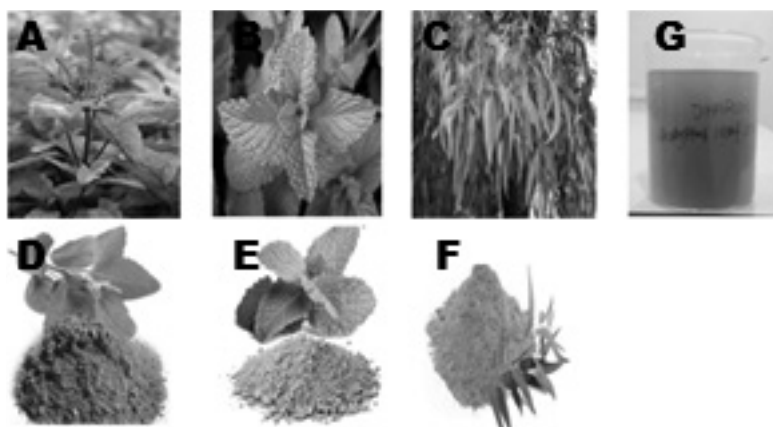


Fig. 1. Ingredients for the Preparation of Wellness Pillow Case (A-Tulsi, B-Mint Sp., C-Eucalyptus, D-Tulsi Powder, Mint Sp., Powder., F-Eucalyptus Powder, G-Herbal Composite)

Preparation of Semi Bleached Cotton Fabric

Greige cotton fabric with the following specifications was collected from a nearby wholesale fabric outlet. Cotton material obtained was scoured and bleached in a sample jigger machine and made ready for finishing.

- Width of the fabric: 44 Inches
- Warp count: 24s
- Weft Count: 24s
- Ends / Inch : 72
- Picks / Inch : 72
- GSM: 165

Finishing of Cotton Fabric Using the Herbal Solution

The fabric was padded in the herbal composite solution in the ratio of 1:3 at 40°C using 8% citric acid (binder) concentration. The wet pickup was adjusted to 100%. The padded fabric was dried at 80°C and then cured at 140°C for 5 min.

Evaluation of Herbal Finished Cotton Fabric

The finished material was checked for its dimensional stability wash and rub fastness at NIFT-TEA college Textile Testing Lab as per BIS standard procedure.

Preparation of Pillow Cover

The fabric was cut and stitched into the standard size of 27" X 17" (LXW) (Fig 2.) using Brother Single Needle Lock Stitch machine (S 1000 A-3) at NIFT-TEA college Garment Construction Lab.



Fig 2. Herbal Finished Cotton Fabric

Study Population

The customized herbal wellness pillow covers were to given to about respondents

(n=20) working in the garment factories and the non-invasive herbal pillow wellness curative aid was given for 48 days to assess their self report sleeping wellness experience after its usage.

Results and Discussion

Quality of herbal finished fabric such as dimensional stability and colour fastness was

checked with BIS standard. The results are shown in the Table 1 & 2. The fabric shrunk by 1.3 percent along the length and 3.5 % along the width. Wash fastness of the herbal prepared fabric was ranked as good with regard to color change and excellent with as far as staining is considered. Readings show that the fabric quality is good and it meets the BIS standards.

Table 1. Dimensional Stability of Herbal Finished Woven Fabric

Particulars	Dimension Before Washing	Dimension After Washing	Shrinkage (%)
Length	50 cm	49.35 cm	-1.3
Width	50 cm	49.25 cm	-3.5

Table 2. Colour Fastness performance of herbal Finished Woven Fabric

Particulars	Wash Fastness (BIS)	Rubbing Fastness (BIS)	
		Dry	Wet
Length	4	4-5	2-3
Width	4-5	4-5	3

The pie chart (Fig.3) reveals the percentage distribution of the working population who reported having insomnia disorder. It was found that thirty-five per cent of the working population in the garment sector working had insomnia disorder. In comparison to the other working professions, the garment working population had more sleeping problems. The various respondents surveyed in the garment industry includes mostly the middle-level professionals such as the chief designer, the merchandising manager, the IE heads, the quality managers and the dyeing masters. Pillow covers (Fig.3) that were given to the above 20 respondents were asked to use them continuously for 48 days. After that, they were personally asked about their experience and pillowcase.

Each feedback is summarized on the graph (Fig.4).

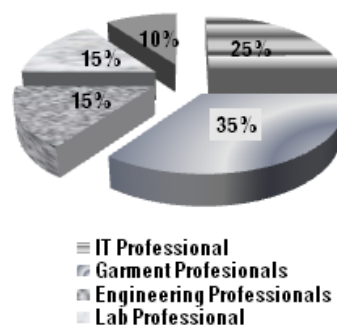


Fig. 3 Distributions of the Survey Respondents in Working Sector

The graph (Fig. 4) showed about eighty-five per cent of the respondents self-feedback of the customized herbal wellness pillow to serve as an excellent best alternate solution for sleeping pills. Eighty per cent of the

respondents claimed the pillow to be a good comforting solution for the sleeping disorder and forty-five per cent of the garment working respondents gave feedback of the customized pillow as excellent in enhancing the sleep and sixty-five per cent of the study respondents

claimed the herbal wellness pillow as good in reducing the stress and sixty per cent claimed it to be good in reducing the headaches. Further, the respondents claimed that these kinds of customized pillow products have good scope for business in the future garment industry.

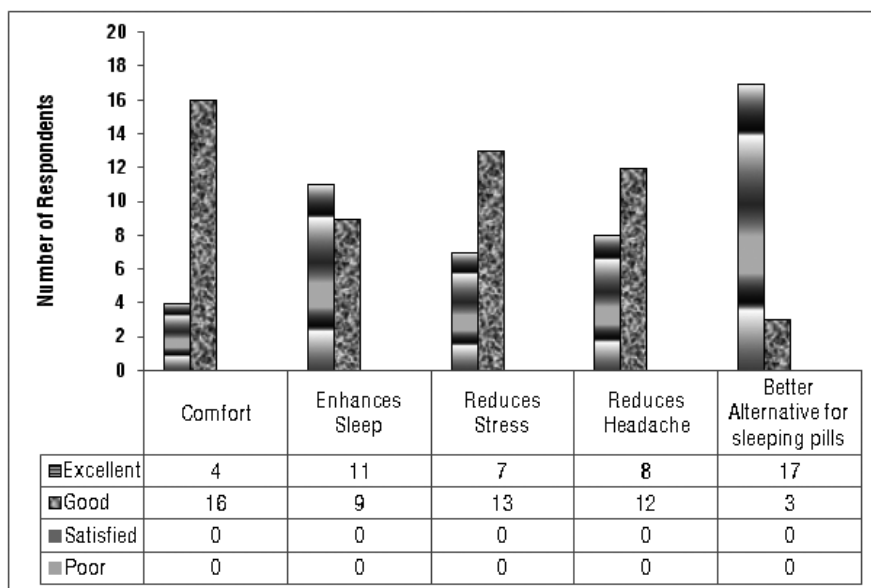


Fig. 4. Self Reported feed-back of Non-Invasive Customized Wellness pillow on Intervention to Garment Factory Working Respondents

Conclusion

Herbals have always shown to have tremendous potential in curing a wide variety of ailments without any side effects. Compared to allopathic treatments, they are relatively inexpensive and they are very effective for consumers. The result of this study has shown that herbal based fabrics to yield a better solution to the problem of insomnia. Also, there is a huge potential for herbal treated fabrics in the future.

Acknowledgement

The authors wish to express gratitude to their respective academic institutions for encouraging them to do the research study and thus enhance their career goals. The authors owe their thanks to all the participants of the research for their support and cooperation. Nevertheless, we are very grateful to the people who supported us directly or indirectly to finish the project successfully. Finally, we express our sincere thanks to our family members for their moral support.

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DWINDLING READING AND WRITING SKILLS AMONG SCHOOL CHILDREN DURING THE PANDEMIC

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Abstract

The pandemic has changed the children's learning process with the advent of online digital devices. The panacea to gather knowledge, these digital devices also has changed the way children get educated. They have forgotten how to read and write, which are the most fundamental skill required for children to become good learners. These primary skills must be developed in children with regular practice to complete a meaningful learning process at a very young age. The review highlights the challenges faced by the stakeholders in the home-schooling learning environment and the effective and interesting ways to tackle the same to develop a young learner.

Keywords: Reading, writing, learning, students, knowledge, strategies

Introduction

The focus on the citizen's health during pandemics urged our leaders to take action with lockdown as a safety measure all over the country. Nevertheless, it brought a drift in the systematic learning process from face to face school environment to an online home school environment. In homeschooling, children attended online classes either through digital devices such as computers,

laptops or smartphones or satellite telecast through other digital devices such as television. Thus, in pandemic times, digital devices became a two-sided coin by playing an advantageous role in children's learning process; right from learning to evaluation on one side and disadvantageous on the other side with shrink in the reading and writing skills of the children.

The unavoidable online classes and their study patterns during pandemics have drastically affected the children's learning process, their knowledge build-up, or the knowledge gap. Many of them have lost the capacity to remember and recollect the previously learned concepts. An Indian study across different school children in five states has depicted the overall loss in the foundation abilities such as reading, writing, conceptual understanding and remembrance, the important characteristics for the development of literacy and numeracy among the learners. A study by the National Council of Educational Research and Training (NCERT) revealed that about 75 per cent of the children's handwriting turned uglier and 65 per cent of them had almost forgotten the ways to read and write and from where to initiate the learning process. A cooperative equal responsibility on the shoulders of

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teachers and parents is essential to bringing back on track the children's learning process during the pandemic crisis.

Ardania *et al.*, (2020) state one of the essential skills required for humans from birth to adulthood is learning that forms the basement for the self-development of better attitudes and behaviours in their everyday life other than academics. Their future becomes unreliable if children aren't inducted with these basic skills of reading and writing at an early life stage with continuous practice. However, with the COVID crisis and emergent shift to online schooling platforms about 91.3 per cent (i.e) approximately about 1.5 billion global learners across all age groups from children, kids to adults were excluded from the normal learning process as per the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020) reports.

The salience of basic learning skills viz., writing, reading other than listening and speaking is lost during emergency disaster distance mode of online education settings that abandoned the physical classrooms leading to threat and fragile implementation of UN sustainable goal 4 (Filhoet *al.*, 2020), necessitates resetting SDG to meet out the education crisis in the pandemic world (Naidoo and Fisher, 2020). Hence it becomes essential to understand how reading and writing becomes essential for the self-development of the children and the different challenges faced by the education stakeholders with suggestions of a few

innovative ways that could be introduced by the teachers and the parents other than the mass governmental online strategies.

Why reading is important?

- **Reading improves vocabulary** not only in kids but also in adults, while a book is read, many new vocabularies or words which we don't know earlier or are unaware of its usage in a sentence. Children sometimes stumble upon with usage of different words or lack knowledge of its appropriate pronunciation or actually what the word means. Hence, continuous reading helps children or young people to phrases and new sentences and improves the writing styles with continuous reading practice, young people encounter new words more frequently through which they can improve their pronunciation as well as develop a presentation of their content.

- **Better comprehension**

Kids who are encouraged to read at an early age have a better comprehension of things around them. They develop smart thinking abilities and are more receptive to creativity and ideas that other kids of their age lack. As a result, they grow up to be good and more intelligent and aware of their surroundings than kids who don't read. The imagination level rises proportionately to the reading habit. While reading a fiction book, the child tends to experience another world. In the new world, the imagination of a child works at its best as they view things from a new perspective.

- **Develops critical thinking skills**

Kids develop critical thinking skills as a benefit of reading books. For example, reading a mystery novel sharpens the reader's mind, about different elements in the story that lead to different conclusions. In the case of non-fiction, the kids will try to find out if whether the author's morale is right or wrong in their perception. Critical thinking skills are very crucial in the day-to-day decision-making process of the children. Reading kindles an individual to think and process information in a way that watching television cannot. More book reading deepens the understanding process and makes them progress towards its application in real-time.

- **Improves memory**

Every time a book is read by a reader who may be children, kids or adult, the book is mainly remembered with its settings viz., the characters, its backgrounds, its history, its personalities, its sub-plots and its story plots. From reading, the child also develops sharp memory. What's more important is, with every new memory you create, you create new pathways and this strengthens the existing ones.

- **Improves results at school**

Kids who indulge in reading a book and learning new things are found to perform well at school. Their creativity level is also high making them open to new ideas and building empathy for others. For

instance, kids try to idolize themselves as characters in their favourite stories. They learn to empathize with characters in the books and want to be like them. They learn incredible life lessons such as helping others and being kind. Moral codes such as goods things are always appreciated and evils are punished take root in their minds too, as a result of which they learn to stay away or face troubling situations.

- **Improves analytical skills**

Reading habit also helps children to figure out how the story would end before finishing the book read. This shows how a child has utilized their analytical skills. Thus reading allows one's thinking skills to get improvised or become more developed in all aspects.

- **Builds confidence**

In a world where competition prevails in every walk of life, it becomes essential to build a child's personality to have considerable confidence in them. Kids lacking confidence at an early stage of their life often develop to be shy, and victimize themselves due to their inferiority complex. They may find it hard to face even the smallest challenge that life throws at them and at many times instead of trying to achieve the goals, instead, they may simply give up. Reading books sharpens various skills along with the self-confidence of the child.

- **Helps in socialization**

By reading and later sharing the content with their peers and family members, the children try to socialize with the community. Humans despite being called social beings are now more virtually connected through smartphones. This drawback could be alleviated in the modern world by engaging the children in book clubs a social place that promotes reading, sharing and interacting with their ideas and thoughts.

- **Broadens horizons**

By reading books, the children get a glance or exposure to new places and cultures. Thus books expand their horizons, by letting them see other countries, other people and so many other things that they have never seen before or imagined. It could be said as “the perfect way to visit a strange country in one’s mind or illusion”. While reading the children sitting in the comfort of their rooms are time travelling with the author’s imaginative world. The children began to visualize everything from the author’s perspective right from the exploration of the new people to the discovery of traditions, cultures etc., that are unique and unforgettable.

- **Improves expressive language skills**

Reading a well-written book influences the ability of the reader to become a better writer. Just like artists influence the observers’ thoughts, so do the writers too. Many successful authors gained their expertise by reading the works of others.

Kids who learn to read also develop better writing skills. One of the main reasons to develop reading skills is that they can be introduced to the world where words are considered as the main effective weapon and they are free to shoot out. Therefore, Parents must also try to develop an interest in writing besides reading. Kids who develop good writing skills don’t fall victim to cramming and they can express themselves more clearly through their words.

- **Improves focus and concentration**

In the social media era, attention is drawn in a million different directions at once the children do multi-task every day. In a single minute span, the children classify their time to their daily tasks and for virtual conversation or play with peers. This type of behaviour triggers stress levels to rise and decrease their productivity. While they start to read a book, their entire attention gets focused on the story-the rest of the world just falls away and makes one immerse in every fine detail of the story and the characters. Reading must be initiated before 15-20 minutes they start with other work. It may be in the morning while they commute, or when they are in public transit), this sharpens their focus before they go to school.

- **Makes you more empathetic**

According to studies, children losing themselves in books, especially fiction might increase their empathy. By reading

a book, the child becomes so much involved in the story that they start to feel the pain and emotions relative to different characters. This in turn allows the children's minds to become more aware of how different things affect people differently. Eventually, this improves their empathy.

- **Foster Emotions**

When a book is read by a reader who may be a child or kid or an individual, they are at the urge to receive knowledge of the message, value, a fact, opinion or emotion the writer has delivered or imparted that ultimately invite us into their emotional psyche. Therefore, it won't be wrong to say that reading fosters or leads to flexed emotions. It builds mind connectivity between the reader and the writer whom they never knew or met before. In certain instances, the children may disagree with what they are delivering or may get to analyze their thought perception and connection at an emotional level.

- **Readers are leaders**

Although not definitively proved, almost all great leaders were found to be voracious readers. The leaders are respected and known for the wisdom that they developed as a result of healthy reading habits. For centuries together, an individual becomes a leader because of his reading habit that influenced their inspiration, growth and development of new ideas. For ages, reading is claimed as a valuable investment to develop one's

personality with uncountable and long-lasting benefits. For any child to become one such leader. The teachers and the parents need to enlighten them on reading habits and show them how reading has influenced the great people of our nation and make them explore how reading could refresh one's soul and mind for a healthy and productive future.

- **Learn at your own pace**

Another benefit of reading a book is the individual learn the book at their own pace. Since the book is with themselves, they can always re-read the section, if they feel like not understanding over and over again. As everything is done at their own pace their mind is free at the most to interpret things in the way how they feel.

- **Escape from Stress**

Reading books reduces stress, helps children to sleep better, improves their health, develops imagination and above all: it is fun to do an activity. Reading has a tremendous effect in fueling various personality aspects and enhancement of their linguistic prowess. It would be apt to say that "the entirety of human life depends on our reading habit". Whatever we grow up to become in our lives, no matter wherever we stand, reading has the one power to shape us at all points right from the starting point.

- **Strategies to improve reading skills**

Reading is a challenging activity because the act of comprehending is not always simple. Depending on the purpose, the

reader should develop the ability to sort the subject, content and language pattern used in different books. Reader at the beginning stage should always start with a book which could make them get involved and develop interest towards reading rather than choosing a vague book (depends on the reader's nature). A reader chooses the book based on different factors such as their age, standard and their interest. (Eg.,) Kids, start with short storybooks; the secondary school students, start with a novel/ autobiography of their idol.

Reading skills can be inculcated in children by following the five main steps that include 1) Time allocation, 2) reading based on their interests or in different ways, 3) Providing more home-based activities, 4) strengthening the spelling skills, 5) checking the pre-reading skills of children. The regular practice of reading books by children in

the allocated time not only develops their reading habits but also helps them to manage time effectively. Children are introduced to different kinds of reading activities (Figure 1). They can take up any reading activity or any documents that are of interest to them such as newspapers, advertisements notes etc rather than reading subject's books. This increase their vocabulary and ways to learn with visualizations. They are made to engage in fun talk activities with parents at home while cooking or any other activity-based house chores. This shall enhance their sentence making and critical thinking skills. Spelling is another way of vocabulary learning, which helps the children to build confidence in learning the correct words, making sense of reading and it must be a continuous process for effective lifelong learning. Frequent assessment of their pre-reading skill of the children is essential during regular practice to enhance their post-reading skills.

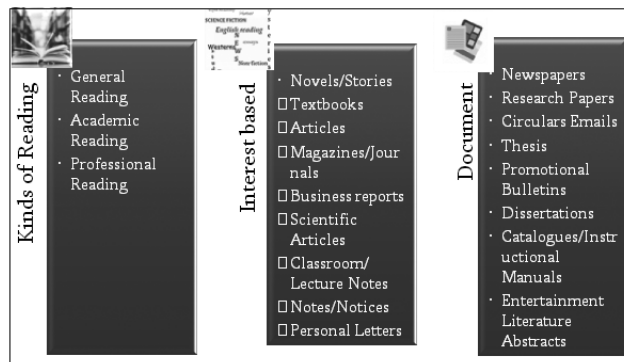


Fig 1. I Can Read Whatever I See

Why is writing important?

Writing is essential as it is primary forms with which the human beings communicate

with others after oral mode. Excellent writing can be developed in the children only when they feel and understand what and how to express their ideas or thoughts or any content.

- **Writing is a practical knowledge.**

It's a natural prodigious ways to teach the learner to self explore and educate. For this, the child essentially needs a good knowledge and appropriate experience about the content of which he/she is going to write.

- **Writing is an important element in student's education.**

Writing is an essential skill for the learners. It may be by hand or on the computer. Students may need to write short answers or longer essays while being assessed for their academics of what they have learned during their tenure. Moreover, each student as they grow old, would have developed unique ways of writing based on their reading abilities and writing talents based on the education they have gained over the period.

- **Written source serve as Records for future**

Students can store their innovative ideas or thoughts in the diary that could be preserved for their future use. Diaries aid in capturing students true inner feelings; that could be recollected and remembered at a later time as it occurred in front of their eyes and mind. Academically scientific journals, research papers were written earlier times to serve as future scientific records.

- **Writing is an important form of communication**

Writing letters and emails is one of the most known ways of interaction with our

friends, families, and peers or colleagues. At times writing is considered as the final stage in communication, when a person desires to leave no room for doubt, for a situation like signing MoU, treaties, confidential files, etc.

- **A great stimulator of Brain**

Writing is an excellent skill that stimulates the brain. It makes the learners to think 'out-of-box' and come out with new innovative ideas on continuous practice. Continuous writing enhances the focus on high-quality content to be printed.

- **Boosts imagination**

Good writing skills foster imagination skills and induces the writer to come up with one-of-a-kind ideas to present in the written content. Also, it enhances the horizons of the students and let them include various subjects that they have never learned before.

Strategies to improve writing Skills

Writing could be made fun-based exercise with the picture book, puzzle activities. It can help the children to improve their writing skill. And also allowing the children to paint and write their innovative ideas, a step ahead in improving their writing skill. This should be incorporated into their daily routine by giving daily some writing activity and as a responsible stakeholder it must be ensured for completion. For small children activity like making a grocery list can be given. Similarly for higher class students drafting a letter exercise and for college student's activity such as writing

an article in a journal can be given as an activity to improve the writing skills. Time should be invested by parents or teachers for active interaction with them so that they can improve the spelling, vocabulary skills etc., and praise them for their good reading and writing or any learning activities. Even the preliminary learning skill, listening is also enhanced with improved reading and writing skills. Each day does some writing should be inducted among the children in one way or another for the children and makes sure they do it. The children must be provided with ample opportunities to gather new words, make them curious about new vocabularies and their meanings through visual image clues. With all the above activities the child learn, discover and build or develop their own style of writing to march forwards confidently towards their future.

Challenges faced by the different stakeholders in the learning process during COVID

Being a parent or a teacher for a child in the online homeschooling learning process is challenging in the prevailing pandemic crisis with many other daily and academic issues respectively. The stakeholders in the online learning home-schooling environment namely the parents, teachers and children are facing numerous challenges that start from the acceptance of deviations in their daily routine aspects. With children urged to study in the alternative home space environment, makes the learners of all ages become inattentive to classes despite continuous mailing or phone calling back states (Willen, 2020). There is also a need for the parents to get engaged in more than 70 – 80 per cent of children's online

learning or rather act as children's learning companions at home despite their difficulties in household chores or jobs (Novianti and Garzia, 2020). In certain circumstances, children without sufficient adult supervision for various reasons such as parents' occupation, elderly or illiterate caretakers also makes online education at the house an unsafe place. As a result psychological distress and work or social impairment gets accumulated among parents and caregivers involved in home-based online schooling and they required continuous emotional and instrumental support for improved outcomes argued Calear *et al.*, 2022).

Lukkariet *al*, (2021) opine that remote teaching required increased stakeholders cooperation, contrary to this, the threshold of parents reaching special education teachers have diminished, and this has burdened teachers and parents alike and has created worry and welfare issues of special children among the teachers. COVID-19 crisis has at the most affected the deaf adults, children and their families due to linguistic delay and social exclusion (Swanicket *al.*, 2020). Their seclusion at home for a long duration with limited interaction among the peer group and the community at large cautioned the United Nation to initiate a 'Disability-Inclusive Response to COVID-19' in May 2020 in recognition of the inclusion of the people with disabilities as the hardest-hit group by the social, economic, and health implications of the pandemic crisis. In sync with this even, the World Federation of the Deaf identified deaf people as the most vulnerable marginalized

group during the pandemic crisis. The review report also states many students at home/living space have undergone psychological and emotional distress during the pandemic and have been unable to engage productively besides the parents, caretakers and teachers (Pokhrel&Chhetri, 2021).

COVID-19 has led to an additional burden to the already existing inadequacies and inequities in the Indian education due to misalignment between resources and needs closing the channels of education for the disadvantaged communities when schools are shut. (Vaijyanthi, 2022). In low socio-economic groups, the technology affordability by parents were difficult and hence children were deprived from getting education or the basic learning foundation skills. Besides the economic downsize, understanding the different online pedagogical measure available for different age grouped children and special children (Doucet *et al.*, 2020) becomes yet another hurdle. For successful online learning, the use of suitable and relevant pedagogy methods with expertise and exposure to information and communication technology (ICT) is required among the educational system stakeholders (Pokhrel & Chhetri, 2021). When Parents from developed countries are expressing their difficulty of being a responsible stakeholder in online homeschooling due to their lack of confidence and incompetency in support (Parczewska, 2021), it becomes still more difficult in developing countries like India with high illiteracy and poverty rates. The sudden transition to online education system during the emergence of coronavirus, many

children or students were not fully prepared to engage in the learning opportunities or they were truant and lot of absenteeism were observed in all grades from elementary to higher studies due to constraints in resources and health that impacted their cognitive and social emotional outcomes especially in their middle school levels which required continued support from the teachers and parents to keep them on track (Santibañez & Guarino, 2021). Actually the children of the elementary, middle and high schools were not immediately adaptive to the online learning mode both physically and mentally as it were difficult for most of them to understand what they hear rather than the conventional teaching methods of chalk and talk methods. Thus it becomes essential for parents and teachers to understand different interesting home-based online learning approaches to serve as effective supportive aids during the natural disasters to build a sustainable future for their children. Thus the prevailing education or the learning crisis could only be overcome by a collaborative and coordinated process of support and understanding of effective online teaching methods from all the stakeholders involved in the learning process.

As an emergency, innovative ways had to be identified by the education stakeholders to improve the learning process of the learners. UNESCO's suggested five ways to help children keep learning from the parent or caretaker's perspective are to plan their routine together, besides academic learning they also must made to have open conversation to express their feelings, Also enable them to engage themselves in their

own online learning and offline or physical activities, make them aware of the online platforms and their behavior to mitigate the risks in online learning by establishing a set of rules for children on how when and where it must be used and by staying in continuous support with children's education facility.

Innovative ways identified by the stakeholders to make learning a continuous process

Some of the other innovative ways identified by the teachers to provide training and educational services for the children includes:., arranging home visits by them once or twice a week; to take them for gardening and walking around the home; make them practice simple board games; make them engage in kitchen activities such as segregation of vegetables and grocery items; engage them in daily routine exercise activities and teaching them with basic academic concepts using home aids such as induction of sensory attributes and its integration using different textures.

To help the special children such as autistic and visually impaired special podcasts were also created by educational institutes to deal with their issues as supportive aids to teach them in play way methods and to enable their monitoring of progress through Whatsapp videos and text messages with accountability of parents. Parent's educational programs were organized to make them aware of the emergency distance learning methods as it is essential to make them aware and educate them about the online learning process. To enhance attractiveness in

learning, children are introduced with books utilizing basic straight letters with shortened and simplified texts. Frequent dictation and reading activities were practiced to enrich the children's vocabulary and creativity. Despite all these innovative teaching methods introduced by the stakeholders comparatively special children are still facing learning difficulties.

Conclusion

Reading and writing are important forms of communication and a key part of an education system. But, in today's technology-driven world, the reading and writing skills of young minds have been stalled without appropriate opportunity and exposure. After the reopening of schools, teachers, parents along students themselves have found that they are facing significant difficulties in basic reading and writing tasks. So, this has made many parents ponder on new methods and techniques to inculcate the reading and writing skills to kindle their talent and creative mind once again.

Noticing this tough situation all over the country, our Honourable Union Education Minister, Mr. Dharmendra Pradhan recently launched the "Padhe Bharat: 100-day reading Campaign" for promoting a joyful reading experience among the young minds from Jan 1st 2022 onwards. This campaign has now brought an interesting answer for the teachers and students to create space for children to learn how to read and write with interest, thus making it a habit to develop the required skills and motivation.

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RESEARCH ABSTRACT

A SURVEY ON INTERRELATIONSHIP BETWEEN SCREEN TIMING AND EATING HABITS AMONG YOUNG ADULTS

* REKHA, N.
** HARSHA JOSHI

Abstract

The prevailing new normal situation has increased the amount of time adolescents and young adults spend on screen time. To analyze the amount of time spent by adolescents and young adults the study was taken to find out the relationship between screen timing and dietary habits among selected young adults from Chennai and Ramanathapuram. The data collection was carried out online mode via Google forms. There was a positive correlation between the quantum of time spent with the dietary habits of the selected young adult population.

Keywords: Youth, Screen time, Life style, Body Mass Index, Digitalization

Introduction

The digital explosion in the last two decades has unavoidably increased human's exposure to prolonged hours of screen time, a growing health impact and concern (Vizcaino *et al.*, 2020). Digitalization is inevitable to store, process data and facilitate rapid, easy and online interactions on social media platforms. This pandemic has flared

up the usage and dependence on the digital floor as the only way for people to maintain the socio-emotional network. Screen time is the amount of time spent in front of an electronic screen device such as a Smartphone, computer, television, video game and other digital devices (DataReportal, 2020).

COVID-19 pandemic further increased the screen time exposure condition irrespective of age, since people had to stay indoors with no other options of going out as most of the places remained closed due to restrictions and regulations laid by the government (Kanekar and Sharma, 2020). The prolonged screen timing as per reports is found to be negatively associated with the physical and mental health of the people. Mental health sickness further accumulates to other mental illness problems such as depression, anxiety and other psychological problems with reduced emotional stability.

Young adults are a group of people who belong to the age group of 18 to 24 years and they encompass the maximum group of the population compared to other age groups. There are research findings that prove that

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screen time directly or indirectly affects the eating habit of people, especially the young adult's age group. Healthy eating is a habit or behaviour associated with improving and maintaining health. Keeping this scenario in mind the study was formulated to find out the relationship between screen timing and dietary habits among selected young adults from the districts of Chennai and Ramanathapuram.

Methodology

The study was conducted among young adults between the age group of 18-24 years including both male and female young adults from Chennai and Ramanathapuram districts respectively using purposive sampling method. The survey was conducted through online mode and the data was collected using a well-structured questionnaire in the form of Google form which encompassed both the close-ended and open-ended questions related to demographic profile, dietary habits, details on amount of time spent on screen, exercise pattern, health disorder and sleep pattern of the selected young adults. On the whole, 227 young adults in the age group of 18-24 years comprising young adults from Chennai (n = 117) and young adults from Ramanathapuram (n = 110) were selected.

Results and Discussion

A maximum of 48 per cent belonged to the age group of 21-22 years. The per cent of females were more compared to males except in the age group of 23-24 years. Only three per cent of young adults were above 24 years of age. Eighty-six per cent of the selected young

adults were graduates and seven per cent of the selected young were postgraduates.

The amount of time spent on screen by the selected young adults showed that most (72%) of the young adults spend more than three hours on their mobile phones.. The young male and female (77%) from Ramanathapuram spent more time on screen compared to young adults from Chennai as adults from Ramanathapuram used more of mobile compared to any other digital gadgets for study and other purposes which was in par with the other studies Ilamparithi *et al.*, (2018).

BMI Classification of the selected young adults revealed that around 20 per cent of the selected young adults were in the overweight category. Female young adults were more in the category of underweight compared to males. Comparison of BMI with the quantum of time spent on the mobile phone revealed that there is a positive correlation. It was observed that as the screen timing increased there was an increase in BMI of the selected young adults.

The food habits showed that 75 per cent of selected young adults were non-vegetarians and 20 per cent of the selected young adults were vegetarians. Skipping of breakfast was found among 23 per cent of them as they did not find time to eat due to late waking up as a result of long hours of usage of mobile phones during the night. Chi-square analysis showed that there is a significant relationship between the time spent on screen and the habit of skipping meals for using mobile

phones among the selected young adults.

The quantum of time spent while eating using the mobile phone showed that 22 per cent of males and 14 per cent of females took 25-35 minutes to complete the meal. Most of them had the habit of watching television while having their meal and could not restrict themselves from watching television while they were eating.

It was also observed eating while watching television prolonged the time of eating and they also tend to eat more while watching TV. Involvement in the performing of basic exercises like walking, jogging and cycling showed that eight per cent of females and 24 per cent of males had the habit of doing exercise. Twenty per cent of the young adults revealed that they were not doing any kind of physical activity. Online ordering of food was prevalent among selected young adults and it was found that males taking foods online were more compared to females. The usage of health apps by the selected young adults to monitor their health was very less which was 17 per cent. Around 24 per cent of the selected young adults watched diet-related videos regularly and they also practised it the daily diet like foods that help in weight reduction, immunity-boosting foods to manage the present pandemic situation. The predominant type of physical discomfort experienced by the selected young adults was headache due to long hours of screen usage. Eight per cent of them experienced muscle and joint pain mainly due to spending more time on screen and due to the wrong posture

while using the laptop, mobile or desktop. A significant correlation at 0.05 level was observed between the amount of time spent on the mobile phone and health-related discomforts experienced among the selected young adults. It was also observed that females experienced more episodes of a one-sided headache than males. Thirty per cent of the young adults experienced this one-sided headache sometimes mainly due to tension and stress. It was encouraging to notice that 76 per cent of the young adults both male and female followed the correct sleeping pattern of seven to nine hours, whereas 21 per cent of the selected young adults slept less than six hours which was inadequate sleep hours which has adverse effects on the health. Correlation between the amount of time spent on the mobile phone before going to sleep had a significant relationship at 0.01 per cent level.

Summary and Conclusion

This study has thrown light on the interrelated factors that affect young adults' health as a result of prolonged usage of digital devices which has been forcefully imposed on people due to the present pandemic situation. It is clearly evident from the study that young adults spend a maximum of their productive hours on screen as they are forced to do so and get exposed in viewing illuminated screens like computers, laptops, social media such as Facebook, WhatsApp, Instagram, YouTube etc., online games and watching TV/movies which have become unavoidable. This changed new normal lifestyle will have

an adverse effect on the health of the young adults especially on their food habits. Young adults are from the productive age group of the entire population, so taking care of their

health by following healthy dietary practices and lifestyle is very much important to lead a healthy life in the future.

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NEWS MAKER

NANOPHOTOSYNTHESIS - A TREATMENT FOR STROKE

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Stroke is the second leading cause of death and disability in the aging population. Besides these, it may also occur due to imbalanced lifestyle behaviour and external environmental risk factors. In Stroke, every minute counts as approximately two million brain cells die without restoration of blood supply to the brain. As per the World Health Organization Reports, it kills about five million people worldwide. Several treatments and rehabilitation options are available to treat the emergency non-communicable disease. In developing countries, Stroke treatments are in high demand due to the increasing rate of stroke incidence. Most of these stroke treatments work only if performed in a narrow window period of post-stroke attack whereas the nanophotosynthetic therapy (NPT) developed by Wang *et al.* (2021) overcome the limitation and also act as a feasible alternative new stroke treatment method. In the NPT approach, cyanobacteria (*Synechococcus elongates*) is directly delivered into the brain coupled with nanoparticles that can efficiently convert the tissue penetrating near Infra-Red light into visible light for simultaneous photosynthesis to happen with the evolution of the byproduct Oxygen. This concept has been proven to be a feasible stroke therapy in rodents' stroke models.

Ischemic stroke, occurs when the oxygen supply to the brain is blocked or depleted as a result of artery blockage or narrowing in

brain. In certain cases it also happens because of excess carbon dioxide acculmulation in brain due to certain other conditions such as acidosis, oxidative stress and mitochondrial dysfunction leading to permanent neuronal death. Stroke and its treatments are mainly focused on either dissolution or surgical removal of the block. Therapeutic procedures viz., Intravenous Thrombolysis (IVT) or Intra-Arterial thrombectomy (IAT) and vascularization procedures have proven to improve clinical outcomes reduce mortality and rescue stroke patients from permanent brain death. However, stroke associated outcome of intracranial haemorrhage limits the possibility of rescue procedures in only less than 5% of stroke patients forcing them to look forward to other new therapeutic interventions. Studies show that prevalent primary hypoxic condition observed in cerebral ischemic stroke could be alleviated to some extent by the use of oxygen-carrying biomaterials. Despite that, its exploration is hindered mainly because of its reduced ability of oxygen-carrying potential. The improvement of cardiac function and increased tissue oxygenation possibility with unicellular obligate photoautotrophic cyanobacteria, *Synechococcus elongatus* (*S. elongatus*) has opened a new avenue to overcome oxygen limitation. Its a living cell that grows in anaerobic conditions and continuously evolve oxygen on illumination with light.

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Scientists simulated a photosynthetic environment for the live blue-green algal cells of *S. elongatus* to sustain inside the human brain with continuous oxygen replenishment in a carbon dioxide-rich photosynthetic environment that could be a possible alternative therapy for stroke patients. They also wondered that simulating a sunlight environment is difficult inside the brain without skull surgery. Thus they deployed nanophototherapy – a process where high penetrative less harmful near-infrared light sources were utilized to irradiate the brain without invasive surgical procedures and to simulate indirectly the photosynthesis environment. Inside the brain, these infrared light were converted into visible light by employing neodymium-doped up conversion nanoparticles (UCNPs) with *S. elongatus* to simulate a photosynthetic environment biocompatible in neuronal cells and generate Oxygen. This process has proven to benefit the brain of mice to recover from its lost nerve function. On testing, a mouse with the skull intact, near-infrared at 808 nm is converted by UCNPs into wavelength usable by bacteria successfully led to CO₂ consumption and oxygen production by *S. elongatus* and

reduced volume of dead tissue and also restored functional recovery in the mice in the context of motor coordination and limb control tests.

Nanophotosynthesis' therapy treatment is still in a very early stage of development; however, their in-vitro and progressing animal stage studies confirm it as a possible feasible future treatment option for stroke in humans. *S. elongatus* and its harmless nature observed in bio-compatibility tests with human neuronal cells prove its ability as a possible biocompatible and safe therapeutic procedure. The absence of immune response on experimentation in living mice also proved its efficacy as an alternate beneficial treatment procedure. Thus, the novel approach of harnessing microorganisms and nanotechnology provides oxygen generating stroke therapy on illumination with far infra red rays. Once the reported bio-system is available, the post-stroke permanent injury can be avoided or it can also act as a short term therapy for hypoxic conditions that arise in many diseases (i.e) therapy time period could be prolonged in stroke patients or their immediate death could be prevented.

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SHORT COMMUNICATION

PROTEASE-A POTENTIAL FOOD SOURCE IN COVID-19 MANAGEMENT

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Abstract

The sudden pandemic outbreak early in December 2019 has caused lives to a stand-still condition compelling the whole world to look for immediate alternate therapeutics. However, the continuing viral evolution with evasion from most therapeutic antibodies raised doubt about its effectiveness potential. What more hurdle is Furins, the essential human endoprotease enabled activation and diffusion of the SARS-CoV-2 virus. As the proverb “Diamond cuts diamond” then why not a protease of COVID-19 be inactivated with yet another human-compatible food source protease or an inhibitor? This theory postulated a look for protease rich natural food sources or their combinations that could break host and virus coordinated proteases actions. Moreover foods and their bioactive components are a proven ancient practice of integrated passive targeted drug delivery systems that are still being practiced by complementary medicine healers for sustained pharmacological action and ease of the ADME (Pharmacokinetics) and Pharmacodynamics principles lacking evidential clinical trial validation.

Keywords : Protease, COVID-19, Food, Management, inflammation

Introduction

The ongoing endemic transition of the coronavirus and speculation about recurrent pandemic waves, despite government measures and vaccine jabs, necessitates the entire world to look for therapeutic alternatives that could at the foremost prevent or manage the situation. SARS-CoV-2 activation by human proteases makes pandemic management difficult (Jian *et al.*, 2020). Hence, designing and developing a pharmaceutical drug or molecule against the human essential protease activator could happen only at the cost of human beings life. Yet scientists have developed vaccines crossing these limitations in different trial stages. On the other hand, SARS-CoV-2 is rapidly evolving non-stop to many scientifically designated variants such as alpha, beta, gamma, delta, omicron and so forth is pushing the entire world to a crisis and a global threat. To restrict this crucial situation, scientists are trying with all options wide open to expedite the process and look out for any drug targeting cheaper therapies available to reach the community of laymen. The tacit approval of the complementary medical system in India with reduced incidence of COVID-19 infections

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among front line workers is a measure in this direction despite many debates raised by the medical professionals. The AYUSH guidelines framed by the Indian Government are yet another breakthrough to reach a larger population.

Protease – Is it a double edged sword?

Proteases are enzyme biocatalyst that hydrolytically cleaves the peptide bonds. Based on the amino acid constitution in the active site, they are named serine, cysteine, glutamine, threonine or aspartic proteases. Many of the proteases require metal ions for their maximal catalytic activity. Hence, they are also called metalloproteases. It can also be classified based on the buffer range at the maximum activity as neutral, alkaline or acidic proteases. Proteases can also be classified based on by-products released as either proteinases or amidases. A huge market potential with a compound annual growth rate of about 6% is predicted for proteases due to its non-toxic and pollution-free industrial applications.

However, proteases are considered vicious in the pandemic spread. In the bio-systems of the host and the SARS-CoV-2 virus, the proteases mediate a co-ordinated viral host entry, maturation and assembly for further diffusion and spread (Gioia *et al.*, 2020). Targeting a molecule against an essential human physiological, biochemical and regulatory protease such as furins becomes a barrier to human life. It becomes still more complicated when the virus gets integrated within the human genome and in a way, it activates its proteases for further rapid spread. Human furins are essential for

proteolytic activation of SARS-CoV-2 and pathogenesis besides transmembrane serine protease 2 (TMPRSS2) (Bestle *et al.*, 2020). The furin cleavage site (PRRAR) in viral spike protein is the key to SARS-CoV-2 pathogenesis (Johnson *et al.* 2020) and deletion of it is reported to attenuate SARS-CoV-2 pathogenesis (Johnson *et al.*, 2021). On the other hand, moving rapidly from epidemic to pandemic and endemic status, COVID-19 necessitates its efficient management with alternate therapeutics besides vaccination.

Hu *et al.*, (2021) pointed out that treatment of the indefinable cytokine storm (Ragab *et al.*, 2020) observed in COVID-19 patients would be a kind of rescue from the severity of the disease. The review by Wong *et al.* (2021) showed how the inflammation in COVID-19 could be shifted from pathogenesis to treatment with the aid of anti-inflammatory strategies. Designing a potential inhibitor against the viral-specific protease is yet another acceptable strategy besides anti-inflammatory treatments to manage the SARS-CoV-2.

The main protease of SARS-CoV2 (M^{Pro}) or 3C Like Protease (3CL^{Pro}) as per reports are highly conserved and more similar to the other viral protease structure but with no close relative homologues in humans (Jin *et al.*, 2020; Zhang *et al.*, 2020; Zhu *et al.*, 2020), Design of specific inhibitors that acts against M^{Pro} / 3CL^{Pro} has been demonstrated for its antiviral activity against its life cycle in numerous reports (Qiao *et al.* 2020; Rut *et al.* 2021; Pillayar *et al.* 2016). It was shown by Papa *et al.* (2021) that furin inhibitors may reduce infectivity and cell-cell spread

but they cannot abolish the SARS-CoV-2 spread. The rapid emergence of new SARS-CoV-2 variants, consecutive recurrences and its sensitivity to vaccines remains unclear (Ferreira *et al.* 2021) and this emergency demands alternate therapeutics (Khan *et al.*, 2021).

Bromelain, the protease in pineapple has proven these two effects of anti-inflammatory and protease function. Studies have proven that it inhibits the expression of Angiotensin-Converting Enzyme (ACE-2) and TMPRSS2 and has also been shown to cleave SARS-CoV-2 spike protein and reduce SARS-CoV-2 infection in VeroE6 Cells (Sagar *et al.*, 2020). Bromelain, a group of complex enzymes (*Ananas comosus*) has been postulated to have resistance to SARS-CoV-2 Infection (Varilla *et al.* 2020). It is a sulfhydryl proteolytic enzyme with multiple advantages in the field of medicine with its disease protection or prevention effect. Scientific reports claim for its beneficial effect in numerous disease protections such

as cardiovascular diseases, blood coagulation and fibrinolysis disorders, infectious diseases, inflammation-associated diseases, and many types of cancer (Hikisz and Bernasinska-Slomczewska, 2021). With its proven antiviral and protease based anti-inflammation and disease protection effect, various other edible food-based bio-sources are being data mined to find other possible proteases based edible natural origin to evidentially prove its bio-efficacy at first through *in-silico* approach and later with extension to large scale feasible food composition formulation and development.

Conclusion

Counteracting the vicious human protease and SARS-Co-V2 with a bio-compatible protease that has proven anti-inflammatory effect would be a better and a viable economically feasible alternative therapeutic strategy to manage the SARS-CoV-2 Virus that is shifting from pandemic to endemic status.

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BOOK REVIEW

URBAN HEALTH

Author : Dr. SUMITHRA SWAMI

Year of Publication : 2020

Publishers : Random Publications,
New Delhi

ISBN : 978-93-5269-685-7, Pp 312

The book on Urban Health has seven chapters. Each chapter is written with clarity and supportive studies and resources to make the readers comprehend the theme of the book.

Chapter-1 on Consequences of Population growth well explains the different sources of collecting population data per se the Census which is the largest source of data for population studies, data on vital events and demographic surveys. Furthermore, the environmental and ecological consequences of population growth and the basic components of population change are vividly explained with supportive references. The chapter ends with the problems of population growth among developed and developing countries.

Dr Swami has portrayed the Urban Scene with its changes in Chapter-2 on Urban life and Health. The author has explained the role of the urban environment and related emotional stress on human health. An illness and health condition change that happens

in men and women due to urbanization is highlighted in this chapter.

Chapter-3 deals with the per capita spending and government expenditures on health. The author has written this chapter with a focus on the economic impact on health care delivery, services and health care infrastructure and concluded that newer technologies per se information technology would create new models to provide viable health care in the 21st Century.

“Method of Health Inequalities” is the next chapter in the book. Social inequality, economic inequality, racial and wealth inequality and their effects on Obesity, Crucial determinants of health outcomes and related health inequality is discussed in this chapter. Equal access to medical care is the focus of this chapter.

The need for a comprehensive approach to health is stressed in chapter-5 on “Health and Society”. Individual and social aspects of health and responsibilities of an individual to cultivate an attitude towards the society in terms of physical well being are emphasized in this chapter. The health status of women, family history of health and prevalence of commonly occurring non-communicable disease conditions are well explained.

The author reiterates the challenges and constraints related to Environmental

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health in Chapter-6. The deleterious effect of heavy metal toxicity and X-ray radiations on individual health is summarized by the author. Control of hazardous substances namely pesticides, exposure limits, worker health and safety versus the environment are pointed out with country wise protocols and regulations.

In the last chapter of the book, Dr. Swami has brought out the issues concerning public and private health infrastructure. The author has explained the

applications of Chaordic principles to health care using various theories and models and concludes that transformation is a key intrinsic to understanding the health care system.

On the whole, this book is very interesting and useful as a reference for urban life, individual health and social health. It further provides an insight into the impact of Urbanization on health care services and ultimately the health of a population.

Kalpana, C.A.

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Vol. 32, No. 1, 2022

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