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Do World Nations Have a Solid Grip to Smash the COVID-19 Pandemic?

ANKIT MONGA 

The era of the coronavirus pandemic has proven to be one of the most consequential and life-turning event in modern human history. Until recently, the human race had to deal with epidemics like Ebola and Swine Flu, which although left a lasting impact on medical sciences and pharmaceutical preparations and forced us to revise our action response plans to coordinate a multi-level functional and coordinated response, the current pandemic has clearly failed all these mechanisms built for such a challenging era. The public health systems have been overwhelmed due to lack of preparation and the failure to recognize the severity of the virus on the part of world governments and international organizations.¹ A well-coordinated response plan within nations and statistical analysis of the potential of the virus and its affects by major organizations tasked with researching such potentially hazardous genomes might have provided an early indication of the severity of the virus. When we talk about communication, lack of coordination amongst nations in enforcing lockdowns and improvising nationwide mask mandates right from the beginning are also some of the major reasons why the virus is now well out of control with millions affected across the planet with no end in sight.²

Many nations have shattered records with alarmingly high number of cases and mortalities within their borders, with many more continuing to grapple with ever-increasing loss of human life while facing a new wave of fresh infections as we enter the winter season. Meanwhile, some Nations are still behind the regulatory measures needed to contain the spread, with people now openly flouting the rules and regulations they followed in earlier lockdowns imposed by respective governments and authorities in major metropolitans and suburban areas.³ The World Health Organization has struggled to get all its member states on the same page and to follow the listed regulatory guidelines. In the words of John

MacKenzie, a virologist and advisor on the WHO's Emergency Committee, the Leaders at World Health Organization are "very frustrated" with the failure of affected Nations to work in conjunction and in accordance with the safety guidance and response protocols to contain the pandemic.⁴

As we move towards the more disastrous phase of the pandemic, as seen from the rise in cases and deaths in the western hemisphere and continued spread in densely populated nations like India, with the advent of the cold season serving as breeding ground for the virus to spread more valiantly, many are enthused by the positive and convincing results shown by vaccines, with the United Kingdom becoming the first nation to successfully start administering vaccinations to its citizens.⁵ Unfortunately, the distribution and successful administration of the vaccine to billions of people residing in over 200 countries will once again demand rigorous cooperation and coordination amongst countries and states across the globe. And with the current level of coordination recorded and observed amongst nations, there is a high possibility that the failure to learn from the past mistakes of this year can translate towards the vaccine administration process of over seven billion people, spelling possible doom over the entire process and causing unnecessary loss of life by an already out-of-control pandemic.⁶ Such once-in-a-century public health emergency demands nations to cooperate and share data and take effective measures to counter-act and control the spread of the disease, before it becomes uncontrollable. And now, the transport, storage and equitable distribution and administration will require a concerted and coordinated multi-national response from every affected country.

REFERENCES

1. Gautam A, Dhara B, Mukherjee D, Mukhopadhyay



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D, Roy S, Ganguly SS, et al. A Digital Survey on the Acceptance and Affordability of COVID 19 Vaccine among the People of West Bengal, India- A Survey Based Study. medRxiv 2020.11.13.20229534, <https://doi.org/10.1101/2020.11.13.20229534>.

2. Ajmera P, Majeed J, Goyal RK, Yadav S, Mukhopadhyay D. Overcoming the Pandemic: Analysing the Ongoing Challenges in the Prevention of COVID-19 in India. Journal of Health Management. 2020;22(4):630-52. <https://doi.org/10.1177/0972063420983076>

3. Mehmood Q, Chahal P, Patel P, Upadhyay P, Nawaz A, Mukhopadhyay D, et al. Sex hormones as an emerging weapon to combat COVID-19. OSF Preprints 2021;27. <https://doi.org/10.31219/osf.io/ncwmz>

4. Sai LV, Mukhopadhyay D, Dudhraj V, Supriya K, Rajya Lakshmi AV. A Review on Biological and Co-

Morbidity as Potential Factors for COVID 19 Heavy Morbidity and Mortality Among the Elderly and Their Implications on Public Health Scenario in India. International Journal of Pharmacy and Pharmaceutical Sciences 2020;18(02):537-46

5. Ghosh A, Mukhopadhyay D, Patel P, Mukherjee D, Chowdhury J, Samal S. Cholera In The Light Of Covid-19: Coercively Displaced People's Neglected Challenge. World Journal of Pharmaceutical Research 10(6):439-442. <https://doi.org/10.20959/wjpr20216-20508>

6. Mukherjee D, Sarkar P, Ghosh A, Patel P, Chowdhury J, Samal S. Notorious Covid-19 pandemic gives eye opening aid to detect Tuberculosis comorbidity. Medico Research Chronicles 2021;8(2):I-V. <https://doi.org/10.26838/MEDRECH.2020.8.2.492>

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Role of Youth in a Post-Covid World

RIYA DUWAL SHRESTHA 

COVID-19 has been affecting the world beyond expectations for almost two years now and this pandemic has taken a heavy toll on people's physical, mental and economic stability. Times of distress like these demand the consolidated effort of all age groups. Particularly, young people have emerged as an active age group, they have shown great efforts as first-line responders, researchers, and volunteers to respond and mitigate many consequences of this epidemic.

History reveals to us that young people have offered a major contribution to every development and revolution of their country and it is widely acknowledged that participation of youth as leaders and active members brings about unprecedented results in achieving health goals. As the health crisis continues to escalate worldwide, the role of youth is indispensable in the post-COVID-19 era. They can contribute to recovery efforts and lead their community back to normalcy.

In the world facing the fright of pandemic, people not only have to fight COVID-19 but also misinformation and misconception that come with it. Above it all, lies a greater battle of finding tranquility amid chaos. Health workers and survivors of this pandemic are battling stigmatization and discrimination due to misinformation about the virus. Such ruthless treatment can mentally affect those with the disease as well as their caregivers. This stigma about COVID-19 will only drive a person away from getting screened, tested, and treated, which has severe public health implications.¹ Elimination of these misconceptions is very important for post-COVID-19 recovery. So, young people can spread community awareness, share authentic information and dismantle myths regarding COVID-19 both online and offline to stop perpetuating negative labels against survivors and health workers. An emblematic example comes from a Youth choir named Ndlovu Youth Choir in South Africa, where they performed

and filmed a musical rendition of the World Health Organization's (WHO) coronavirus safety advice to spread community awareness and avoid unverified information.²

Health care workers are globally in high demand, young people can take initiative to ease pressure on frontline workers and find opportunities to give to their community as volunteers. Volunteering will not only support those who require help but will also give young volunteers a sense of meaning and optimism. Many young people around the world have responded by working through these real challenges and making meaningful changes. Josh St John James, 17 from Kingston in London who set up a volunteer group to help out the elderly ensuring that the vulnerable are neither hopeless nor helpless is the quintessence of how youth can radiate positivity and a sense of security during the pandemic.³ Hami Nepal Youth Organization, a non-profit organization from Nepal working relentlessly to save countless lives through the distribution of critical supplies for both the healthcare sector and the wide population to fight this virus shows a great example of youth involvement.⁴

Another critical aspect of combating coronavirus is research. Hamza Meghari of Palestine, a Clinical Care Research Assistant currently based in the UK, is conducting a study of clinical and epidemiological characteristics of COVID-19 in association with the World Health Organization (WHO). Researches like this not only help us understand the nature of the virus better but are capable of preventing its further spread and bringing better management tactics.⁵

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (WHO, 1948). Lockdown protocol has helped in reducing the spread of the virus. However, these restrictive measures have



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harshly affected the mental health of individuals.⁶

It has caused anxiety, disruption, stress, and stigma in society. As the world recovers, youth can contribute by understanding the psychological stress caused by the virus and increase efforts in helping their community. They can continue to advocate for mental wellbeing and be someone to whom others can turn for psychological support. Focusing on the maintenance of mental health, public awareness campaigns can be organized in this prevailing situation. Young family members should take some time to converse with older members of the family and become more involved in their daily activities whenever possible.

Writing about the roles youth have to play in this time of the pandemic, it is an undeniable fact that young people have significantly been affected and it is compounding the already uncertain future of young people. The International Labour Organization (ILO) estimates that more than one in six young people have stopped working due to the pandemic.⁷

Despite the extreme circumstances, young people are using their creative and innovative energy to fight against the crisis and return their community to normalcy. We need youth leadership now more than ever and as changemakers, they play a crucial role in ensuring people that the health plans and the developmental goals are resilient as we take the path of recovery in this post-COVID-19 era.

REFERENCES

1. Akoto, B. Stigma and scars of coronavirus. Your Commonwealth (Online Article). Available from:

<https://www.yourcommonwealth.org/social-development/health-safety-wellbeing/stigma-and-scars-of-coronavirus/> [Last Accessed on 12th May, 2021]

2. Wickramanayake, J. Meet 10 young people leading the COVID-19 response in their communities. Africa Renewal (United Nations, Online Article). Available from: <https://www.un.org/africarenewal/web-features/coronavirus/meet-10-young-people-leading-covid-19-response-their-communities>. [Last Accessed on 12th May, 2021]

3. O'Shea, J. Coronavirus: Volunteers rally round to help those self-isolating. BBC News. (Online Article). Available from: <https://www.bbc.com/news/uk-england-51821470> [Last Accessed on 12th May, 2021]

4. Badal, P. Admirable work by Hami Nepali Youth Organization during COVID crisis. Inform Nepal. (Online Article). Available from: <https://informnepal.com/exemplary-work-of-hami-nepali-youth-organization-for-the-betterment-of-the-community/> [Last Accessed on 30th May, 2021]

5. Women Deliver. 10 Ways Young People are Leading the Way Against COVID-19. (Online Article). Available from: <https://womendeliver.org/2020/10-ways-young-people-are-leading-the-way-against-covid-19/> [Last Accessed on 30th May, 2021]

6. Nicolás ES. WHO warning on lockdown mental health. EU observer. (Online Article). Available from: <https://euobserver.com/coronavirus/147903> [Last Accessed on 30th May, 2021]

7. International Labour Organization (ILO). ILO Monitor: COVID-19 and the World of Work. Fourth Edition. (Online PDF). Available from: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_745963.pdf [Last Accessed on 30th May, 2021]

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The Screening and Treatment of Vitamin B₁₂ Deficiency

PARUL SAHNI

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Vitamin B₁₂ deficiency is now more prevalent than ever. It is a common cause of megaloblastic anemia, neuropsychiatric disorders, and other clinical manifestations. Screening is required in patients with single or multiple risk factors. Measurement of serum methylmalonic acid can be used to confirm deficiency in asymptomatic high-risk patients with low-normal levels of vitamin B₁₂. Oral administration of high-dose vitamin B₁₂ as well as intramuscular administration are effective as corrective therapy. This review briefs about the pharmacokinetics and pharmacodynamics of Vitamin B₁₂, risk factors associated with its deficiency, screening methods and treatment options.

KEYWORDS: Vitamin B₁₂, Cyanocobalamin, Cobalamin

INTRODUCTION

Vitamin B₁₂ is a common name for a group of cobalt-containing biologically active substances that differ in the structure of the ligand coupled to cobalt atom and called cobalamins.¹ The main cobalamins in humans are hydroxocobalamin, adenosyl cobalamin and methylcobalamin, of which the latter two are active forms of coenzyme.² In vitamin B₁₂ preparations, cyanocobalamin is most commonly used as the active substance, which differs from other cobalamins in greater stability in the external environment and higher bioavailability, and therefore, it is cyanocobalamin that is usually referred to as “vitamin B₁₂” in clinical practice.³ Vitamin B₁₂ is involved in numerous physiologic processes required for normal growth, development, and metabolism of humans, and its deficiency can lead to severe, including life-threatening, disorders of various organs and systems. Studies conducted in recent decades worldwide have shown an increase in the prevalence of vitamin B₁₂ deficiency, including its subclinical form, which may be due to both improved diagnosis and ageing of population and associated polymorbidity. This is the reason for the ongoing search for new approaches to the diagnosis and treatment of B₁₂-deficient states.

Vitamin B₁₂ enters the body with proteins of food from which it is released at low pH in the stomach lumen.⁴ After release, it binds to haptocorrin and remains complexed with it until proteolytic cleavage in the duodenum, where it binds to the Castle's intrinsic factor. After entering the brush border of the enterocyte, vitamin B₁₂ separates from the Castle's

intrinsic factor and enters the bloodstream, where it binds to transcobalamin II or haptocorrin, which deliver cobalamin to peripheral tissues and the liver.⁴ Most of the cobalamin transported by haptocorrin is metabolically inactive. Castle's intrinsic factor is responsible for absorption of approximately 99% of vitamin B₁₂, while 0.5–5% is absorbed from the mucosa by simple diffusion all along the gastrointestinal tract.^{4–5} Vitamin B₁₂ is distributed to almost all organs and tissues. Its steady-state concentrations are produced most rapidly in plasma, red blood cells, liver and kidneys, more slowly in adipose tissue, skeletal muscles, bone and brain.⁶ The main site of vitamin B₁₂ deposition is the liver, where up to 90% of its reserves are concentrated.⁶ Up to 3–7 µg of vitamin B₁₂ are excreted with bile from liver into the intestines per day, and about 75% of this amount is reabsorbed. Enterohepatic circulation determines the long half-life of vitamin B₁₂ from the liver, about 12 months.⁷ In the body, cyanocobalamin is converted to coenzyme forms, methylcobalamin and 5-deoxyadenosylcobalamin. Methylcobalamin is involved in numerous transmethylation reactions and acts as a coenzyme for methionine synthase catalyzing the conversion of homocysteine to methionine required for the formation of S-adenosyl methionine, a universal methyl group donor for almost 100 different substrates, including DNA, RNA, hormones, proteins, and lipids.^{3,4} Methionine is required for the conversion of folic acid to folinic acid, which provides a normoblastic type of hematopoiesis. 5-deoxyadenosylcobalamin is a cofactor for the reaction of L-methylmalonyl-CoA isomerization



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in succinyl-CoA during the degradation of propionic acid, which plays an important role in the metabolism of carbohydrates and lipids.⁵ Cobalamin deficiency results in accumulation of methylmalonic acid and neurologic symptoms. Succinyl-CoA is also necessary for the synthesis of hemoglobin.⁵ Cells that divide rapidly need vitamin B12 most. Vitamin B12 deficiency leads to impaired proliferation of hematopoietic cells and epithelial cells, increased concentrations of propionic and methylmalonic acids that have a damaging effect on the myelin sheaths of nerve fibers, and Hcy, which is a risk factor for cardiovascular complications.⁸ Clinically, vitamin B12 deficiency can manifest as lesions of various organs and systems. The classic manifestation of B12 hypovitaminosis is considered pernicious (B12-deficient) anemia associated with insufficient production of the Castle's intrinsic factor by parietal cells of the stomach.

However, in recent years, neurological manifestations of vitamin B12 deficiency have become a priority, such as sensory and motor disorders, ataxia, cognitive impairment, including those leading to dementia and mental disorders, which often occur in the absence of hematological disorders.⁹ In epidemiological studies, vitamin B12 deficiency was associated with the occurrence of infertility, delayed development of children, as well as thrombosis, including thrombosis of cerebral venous sinuses.^{7,10} Thrombosis was observed in severe vitamin B12 deficiency, resulting in marked hyperhomocysteinemia.⁷ In the elderly, vitamin B12 deficiency was also associated with decreased tolerance to orthostatic hypotension, being an important cause of falls and associated fractures¹¹, with an increased risk of age-related macular degeneration¹², senile asthenia¹³, and sarcopenia¹⁴, which are important causes of disability. Vitamin B12 deficiency may develop due to its insufficient intake with food, increased need, malabsorption, disturbance in transport or metabolism. Since vitamin B12 metabolism in the body is complicated, it can cause vitamin deficiency at any stage. The latter is especially typical for the elderly due to age-related physiological changes, polymorbidity and polypharmacy.² In economically developed countries, the most common causes of vitamin B12 deficiency include atrophic gastritis, administration of medicinal products that reduce gastric acidity, metformin, and chloramphenicol.¹⁵ The elderly are at highest risk of developing vitamin B12 deficiency, especially those over 75 years old.³ In economically developed countries, the prevalence of vitamin B12 deficiency is about 6% in people under 60 years of age, about 20% in those over 60 years of age¹⁶, and 23–37% in those over 80 years of

age¹⁷, but its actual prevalence in the elderly may be even higher because symptoms of deficiency in the elderly may be masked by age-related changes and comorbidities.² About 10–25% of the elderly have subclinical vitamin B12 deficiency characterized by low serum levels of the vitamin in the complete absence of clinical symptoms or with mild general symptoms that are often mistakenly associated with other disorders.¹⁸ It should be noted that the development of clinical symptoms of vitamin B12 deficiency since the onset of etiological factor can be delayed by 3–10 years due to its high body stores and long half life in the liver.^{12,18} However, even subclinical vitamin B12 deficiency can lead to increased serum Hcy concentration and an increased risk of cardiovascular diseases^{19,20} and, apparently, cognitive impairment.²¹ The main development mechanism of vitamin B12 deficiency in the elderly, occurring in 40–70% of cases, is the food-cobalamin malabsorption syndrome, a disorder characterized by the inability to release cobalamin from the link with food proteins, which leads to the unavailability of the vitamin to form the complex with the Castle's intrinsic factor.^{22,23} Factors contributing to this syndrome include atrophic gastritis, *Helicobacter pylori* infection, antisecretory drugs, alcohol abuse, gastric bypass or certain other GI surgeries, and chronic exocrine pancreatic insufficiency.²² It should be kept in mind that absorption of vitamin B12 from food worsens as early as at the age of over 50 years.³ In addition, elderly people with normal serum vitamin B12 values may have its functional deficiency due to oxidative stress.²³ The risk of both pernicious anemia and neuropsychiatric disorders is significantly higher in the elderly than that in younger people.^{9,24} Many elderly patients, especially those with comorbidity, such as renal insufficiency and/or diabetes mellitus, even with normal serum levels of cobalamin and HoloTC, may have elevated MMA levels, which led to the hypothesis that they are resistant to cobalamin and, consequently, should be prescribed higher doses of vitamin B12.²⁵ Other vulnerable population categories for vitamin B12 deficiency include vegans and strict vegetarians, pregnant and breastfeeding women, infants of the first 2 years of life, particularly those who were exclusively breastfed, those with pernicious anemia, celiac disease, and Crohn's disease, those who underwent GI surgery resulting in the impaired production of the Castle's intrinsic factor and hydrochloric acid secretion.^{10,25} The need for vitamin B12 is also increased in people who abuse alcohol, smokers, and those with HIV infection, tuberculosis, kidney disease, hyperthyroidism, and diabetes mellitus.^{10,25} Given the potentially serious consequences of vitamin B12 deficiency and the

irreversibility of some of them, in particular neurological ones in case of delayed initiation of treatment²⁶, it is necessary to identify the deficiency in early stages and to prescribe treatment in a timely manner.²⁷ Therefore, screening for vitamin B12 deficiency in populations with risk factors is advisable. According to experts, screening for vitamin B12 deficiency may be warranted in patients with one or more risk factors, such as gastric or small intestine resection, inflammatory bowel disease, administration of metformin for more than 4 months, administration of proton pump inhibitors or H2 blockers for more than 12 months, veganism or strict vegetarianism, and age over 75 years.³ Since the risk of serious consequences of vitamin B12 deficiency, including pernicious anemia, cognitive and behavioral disorders, depression, myocardial infarction, stroke is highest in the elderly, many researchers advise screening for vitamin B12 deficiency in all the elderly.²² It is possible that in addition to the elimination of neurological and hematological symptoms, vitamin B12 may have other favorable effects in the elderly, such as antidepressant, antipsychotic²², analgesic, and opioid-sparing.²⁸ As of now, there is no gold standard for diagnosing vitamin B12 deficiency. Furthermore, there is no commonly accepted determination of normal vitamin B12 levels. The World Health Organization considers the vitamin B12 status in adults to be sufficient at serum levels greater than 221 pmol/L. Levels of 148 to 221 pmol/L are considered low, and less than 148 pmol/L are considered B12 deficiency.²⁹ Several circulating biomarkers can be identified for diagnostic purposes: total B12, active B12 (HoloTC), and 2 metabolic markers, Hcy and MMA. The determination of each of these biomarkers has its limitations, as their level may be altered by some nonspecific factors, therefore taking into account the availability and cost of tests, a stratified stepwise approach, starting with the determination of total vitamin B12 level and complete blood count are typically advised to assess B12 deficiency.²⁷

Patients with serum cobalamin levels IN the range of 110–148 pmol/L are recommended to be retested in 1–2 months.³⁰ Patients with persistent suboptimal cobalamin levels should be tested for titers of Castle's intrinsic factor antibodies and given low doses of oral vitamin B12. Such patients should be warned of the need to closely monitor for potential neurologic symptoms and if they occur, seek medical attention immediately. Patients with positive tests for the Castle's intrinsic factor antibodies should be treated according to the

therapeutic guidelines for pernicious anemia. In patients with negative test results, the cobalamin levels should be re-evaluated in 3–4 months and, if remained low, the biochemical testing should be continued to confirm biochemical deficiency.³¹ It is a paradox that some patients with symptoms of vitamin B12 deficiency have elevated serum cobalamin levels with parallel elevation of MMA and Hcy markers. This functional deficiency of cobalamin, which is more often asymptomatic, can develop with increased binding of vitamin B12 to haptocorrin rather than transcobalamin II, followed by a decrease in the vitamin delivery to peripheral cells.⁴ These patients are recommended to receive trial therapy with hydroxocobalamin.³⁰ Elevated B12 levels are usually associated with liver disease and hematologic abnormalities, but may occur in some cancers⁴, suggesting that some cancers may impair the metabolism of vitamin B12. Repeated intramuscular injections of vitamin B12 have been considered the gold standard of therapy for B12-deficient states, but they have a number of limitations that can degrade quality of life. First, injections are painful, causing fear of treatment or refusal in a number of patients. Second, they cause adverse reactions at the injection site, including intramuscular hematomas, especially in individuals receiving concomitant antithrombotic therapy.²

Injectable forms of vitamin B12 are more allergenic than tablets. In addition, injectable products require consumables and healthcare professionals for their administration, which in combination with an increased risk of adverse reactions and the high cost of injectable therapy, leads to an additional economic burden for patients themselves and the healthcare system. Given the fact that many patients, such as those with pernicious anemia or irreversible digestive tract disorders, require lifelong vitamin B12 replacement therapy, it can have significant negative medical and economic effects. An alternative to injectable products is the high-dose oral cyanocobalamin agents, which create sufficient cobalamin concentrations in the blood through diffuse absorption mechanism, including in patients with cobalamin malabsorption of various etiologies, including Castle's intrinsic factor deficiency, atrophic gastritis, surgeries and antiseecretory drugs. The efficacy and safety of oral drugs containing 1,000 µg of cyanocobalamin in individuals with vitamin B12 deficiency have been demonstrated in numerous studies, including comparative ones with intramuscular vitamin B12, and in metanalyses.

CONCLUSION

Research work conducted in recent years across the globe indicates an increase in the prevalence of vitamin B12 deficiency. Further studies are required to detail the features of the pharmacokinetics and pharmacodynamics of vitamin B12, the causes and risk factors for the development and clinical manifestations of its deficiency. Also, the concerned professionals should provide updated modern recommendations for screening and diagnosis of vitamin B12 deficiency.

REFERENCES

- Kennedy DO. B vitamins and the brain: Mechanisms, dose and efficacy —A review. *Nutrients*. 2016;8:68. <https://doi.org/10.3390/nu8020068>.
- Andr  s E, Zulfiqar AA, Vogel T. State of the art review: oral and nasal vitamin B12 therapy in the elderly. *QJM*. 2020;113(1):5-15. <https://doi.org/10.1093/qjmed/hcz046>
- Langan RC, Goodbred AJ. Vitamin B12 Deficiency: Recognition and Management. *Am Fam Physician*. 2017;96(6):384-9.
- Shipton MJ, Thachil J. Vitamin B12 deficiency — A 21st century perspective. *Clin Med (Lond)*. 2015;15(2):145-50. <https://doi.org/10.7861/clinmedicine.15-2-14>
- Romain M, Svir   S, Linton DM, Stav I, van Heerden PV. The role of Vitamin B12 in the critically ill — a review. *Anaesth Intensive Care*. 2016; 44(4):447-52.
- Alpers DH. Absorption and blood/cellular transport of folate and cobalamin: Pharmacokinetic and physiological considerations. *Biochimie*. 2016; 126:52-6. <https://doi.org/10.1016/j.biochi.2015.11>
- Stabler SP. Clinical practice. Vitamin B12 deficiency. *N Engl J Med*. 2013;368(2):149-160. <https://doi.org/10.1056/NEJMcpr113996>
- Carmel R. Current concepts in cobalamin deficiency. *Annu Rev Med*. 2000; 51:357-375. <https://doi.org/10.1146/annurev.med.51.1.357>
- Andr  s E, Loukili NH, Noel E, Kaltenbach G, Abdelgheni MB, Perrin AE, Noblet-Dick M, Maloisel F, Schlienger JL, Blickl   JF. Vitamin B12 (cobalamin) deficiency in elderly patients. *CMAJ*. 2004;171(3):251-259. <https://doi.org/10.1503/cmaj.1031155>
- Sukumar N, Saravanan P. Investigating vitamin B12 deficiency. *BMJ*. 2019; 365:11865. <https://doi.org/10.1136/bmj.l1865>
- Moore A, Ryan J, Watts M, Pillay I, Clinch D, Lyons D. Orthostatic tolerance in older patients with vitamin B12 deficiency before and after vitamin B12 replacement. *Clin Auton Res*. 2004;14(2):67-71. <https://doi.org/10.1007/s10286-004-0142-x>
- Gopinath B, Flood VM, Rochtchina E, Wang JJ, Mitchell P. Homocysteine, folate, vitamin B-12, and 10-y incidence of age-related macular degeneration. *Am J Clin Nutr*. 2013;98(1):129-135. <https://doi.org/10.3945/ajcn.112.057091>
- Soh Y, Won CW. Association between frailty and vitamin B12 in the older Korean population. *Medicine (Baltimore)*. 2020;99(43):e22327. <https://doi.org/10.1097/MD.00000000000022327>
- Ates Bulut E, Soysal P, Aydin AE, Dokuzlar O, Kocyigit SE, Isik AT. Vitamin B12 deficiency might be related to sarcopenia in older adults. *Exp Gerontol*. 2017;95:136-40. <https://doi.org/10.1016/j.exger.2017.05.017>
- Green R, Allen LH, Bj  rke-Monsen AL, Brito A, Gu  ant JL, Miller JW, Molloy AM, Nex   E, Stabler S, Toh BH, Ueland PM, Yajnik C. Vitamin B12 deficiency. *Nat Rev Dis Primers*. 2017;3:17040. <https://doi.org/10.1038/nrdp.2017.40>
- Hunt A, Harrington D, Robinson S. Vitamin B12 deficiency. *BMJ*. 2014; 349:g5226. <https://doi.org/10.1136/bmj.g5226>
- Johnson MA, Hausman DB, Davey A, Poon LW, Allen RH, Stabler SP; Georgia Centenarian Study. Vitamin B12 deficiency in African American and white octogenarians and centenarians in Georgia. *J Nutr Health Aging*. 2010;14(5):339-45. <https://doi.org/10.1007/s12603-010-0077-y>
- Carmel R. How I treat cobalamin (vitamin B12) deficiency. *Blood*. 2008; 112(6):2214-21. <https://doi.org/10.1182/blood-2008-03-040253>
- Ammouri W, Tazi ZM, Harmouche H, Maamar M, Adnaoui M. Venous thromboembolism and hyperhomocysteinemia as first manifestation of pernicious anemia: a case series. *J Med Case Rep*. 2017;11(1):250. <https://doi.org/10.1186/s13256-017-1415-z>
- Kim J, Kim H1, Roh H, Kwon Y. Causes of hyperhomocysteinemia and its pathological significance. *Arch Pharm Res*. 2018;41(4):372-83. <https://doi.org/10.1007/s12272-018-1016-4>
- Carmel R. Subclinical cobalamin deficiency. *Curr Opin Gastroenterol*. 2012; 28(2):151-8. <https://doi.org/10.1097/MOG.0b013e3283505852>
- Wong CW. Vitamin B12 deficiency in the elderly: is it worth screening? *Hong Kong Med J*. 2015;21(2):155-164. <https://doi.org/10.12809/hkmj144383>
- Solomon LR. Functional cobalamin (vitamin B12) deficiency: role of advanced age and disorders associated with increased oxidative stress. *Eur J Clin Nutr*. 2015;69:687-92. <https://doi.org/10.1038/ejcn.2014.272>
- Zik C. Late Life Vitamin B12 Deficiency. *Clin Geriatr Med*. 2019;35(3):319-25.

- <https://doi.org/10.1016/j.cger.2019.03.004>
25. Solomon LR. Disorders of cobalamin (vitamin B12) metabolism: emerging concepts in pathophysiology, diagnosis and treatment. *Blood Rev.* 2007;21(3):113-30. <https://doi.org/10.1016/j.blre.2006.05.001>
26. Briani C, Dalla Torre C, Citton V, Manara R, Pompanin S, Binotto G, Adami F. Cobalamin deficiency: clinical picture and radiological findings. *Nutrients.* 2013;5(11):4521-39. <https://doi.org/10.3390/nu5114521>
27. Jarquin Campos A, Risch L, Nydegger U, Wiesner J, Vazquez Van Dyck M, Renz H, Stanga Z, Risch M. Diagnostic Accuracy of Holotranscobalamin, Vitamin B12, Methylmalonic Acid, and Homocysteine in Detecting B12 Deficiency in a Large, Mixed Patient Population. *Dis Markers.* 2020;2020: 7468506. <https://doi.org/10.1155/2020/7468506>
28. Buesing S, Costa M, Schilling JM, Moeller-Bertram T. Vitamin B12 as a Treatment for Pain. *Pain Physician.* 2019;22(1):45-52.
29. Hannibal L, Lysne V, Bjørke-Monsen AL, Behringer S, Grünert SC, Spiekerkoetter U, Jacobsen DW, Blom HJ. Biomarkers and Algorithms for the Diagnosis of Vitamin B12 Deficiency. *Front Mol Biosci.* 2016;3:27. <https://doi.org/10.3389/fmolb.2016.00027>
30. Devalia V, Hamilton MS, Molloy AM; British Committee for Standards in Haematology. Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *Br J Haematol.* 2014;166(4):496-513. <https://doi.org/10.1111/bjh.12959>
31. Arendt JFH, Sørensen HT, Horsfall LJ, Petersen I. Elevated Vitamin B12 Levels and Cancer Risk in UK Primary Care: A THIN Database Cohort Study. *Cancer Epidemiol Biomarkers Prev.* 2019;28(4):814-21. <https://doi.org/10.1158/1055-9965.EPI-17-1136>

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Door to Surpass Barriers: A Key for Better Utilisation of Dental Services

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Oral health is an important component of a person's overall health. Oral health care services have long been a concern in underdeveloped nations like India since they are expensive, inaccessible, and underutilized by the general public. Oral health treatment is costly in both the business and private sectors levels and are inexpensive in medical and dental schools, where they are offered by trainees under good supervision. Unawareness of the importance of oral health, a lack of recognized needs, financial restraints, cultural and psychological hurdles are only a few of the challenges that prevent the general public from taking advantage of these services. Oral health insurance, government implementation awareness initiatives, and the development of oral health policies could all help to overcome these obstacles. Every dental surgeon should make a contribution to the cause about this shift in the Indian population's behaviour.

KEYWORDS: Dental Health, Oral Health, Healthcare, Social Class

INTRODUCTION

The individual's lifestyle and habitat are shaped by the norms of the society to which they belong and people's interactions with the socio-cultural system. The community plays a big part in determining who we are, our health status and illnesses, which have resulted in a significant influence on the programs outcomes focused towards promoting the health of the community. Access to oral healthcare for these marginalized groups is frequently hampered.¹ Individuals with special needs,² specific ethnic minority groups,^{3,4} those suffering homelessness⁵ people of poor socioeconomic status,^{6,7} and rural communities⁸ among others, have been demonstrated in previous studies to have greater levels of dental caries than the general population.

A majority of dental problems are not self-limiting. Dental problems, if left untreated, can have a negative impact on a person's health and overall quality of life. Oral hygiene at home is required on a regular basis. The best method is to take care of your teeth and have a yearly dental check-up for the purpose of saving one's own teeth.⁹ Access to health services comprises universally (i) a political factor including decision-making and agreement by various levels of government in a country, resulting in universal access to health services prioritising and organising services in a systematic manner (ii) Economic and societal implications of intervention devices elements relating to finance, mitigation, or elimination (iii) the system's organisation, the users obstacles commencing with

interaction with the service and ending with the resolution and (iv) Understanding the health-disease the users first transitions, beliefs, values, and traditions, via comprehensive actions and respect for individuals, technical-scientific training and cultural competency.¹⁰

COMMON PROBLEM WITH ORAL HEALTH CARE DELIVERY SYSTEM¹¹

1. Resources are insufficient
2. Emphasis on prevention and public health is insufficient.
3. Goals are unclear.
4. Lack of public involvement and accountancy.
5. Imbalance of distribution of services.
6. Scanty organisation and management
 - Poor planning
 - Administration not unified
 - Little emphasis on evaluation
6. Manpower planning and use of auxiliaries failure.
7. High professional standards not being promoted.
8. Dental training not align to health service goals.
9. Dental research does not sufficiently dispose to health care needs and prevention.
10. Unclear strategies for implementing policies.
11. Approach problems.

DENTAL SERVICES IN INDIA:

India is a developing country with 1.39 billion population. Moreover 70% of Indian population inhabits in rural areas with mini health care facilities



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and more share of health facilities is taken up by the urban population. Eventually in urban areas poor people are neglected a lot in terms of health and oral health issues. However there is a huge oral health inequality among the mass rural population.¹²

BARRIERS TO ACCESS THE ORAL HEALTH IN INDIA^{12,13}

1. Knowledge and Values: Person those in need of oral health care are unaware of oral disease prevention and are unaware of their clinical need. The general public frequently does not recognise the significance of oral health, considers it to be separate from and secondary to one's overall health. Many decision-makers in government do not recognise or appreciate oral health as a part of one's overall health and dental health care is pushed to the sidelines in favour of general health care. Health has been relegated to a lower priority policy.

2. Accessibility Issues: Due to regional disparities, many people in need do not have access to an oral health provider in their area. Much of the oral health workforce is unprepared to provide culturally competent care to a diverse population, including people with complex medical and psychological conditions, developmental and other disabilities, the very young and the elderly, tribal or rural areas, and people with complex medical and psychological conditions or developmental and other disabilities.

3. Affordability Issues: Many underprivileged communities are unable to obtain and afford dental care. Some of the underserved are unable to get services due to their financial circumstances. In India, dental insurance is almost non-existent.

4. Systemic Barriers: In India's oral health care delivery system, there are numerous systemic impediments. Health services are distributed inequitably with the bulk of dentists based in cities and urban places, and just a few dentists practice in locations where the bulk of the population resides. Due to a severe scarcity of dentists in government services, the majority of health care services are given by private practitioners and dental institutions by trainees, raising the expense of quality oral health care services and making it unaffordable for the majority of India's rural population. There is a dearth of research on the delivery and utilisation of oral health care. Oral health records, statistics, and a dental treatment audit for the area served are not readily available.

5. Patient Problems: The bulk of the Indian population has a dread of dental care, which prevents people from obtaining treatment. The processes at the front desk and in the waiting room can take a long time. Fear of white coats and bright lights, clinical odours, feeling vulnerable, lack of perceived necessity for frequent dental checkups, high expense of dental treatment, time away from work, and taboos/ misunderstandings about dentistry are other important barriers to patients receiving oral health care.

6. Quality of Dental Workforce: Another significant difficulty is ensuring that future generations have access to a high-quality workforce. Dental education has become a business as a result of increased college commercialization, and the profession's ethical core has eroded. With the passage of time, the moral standards of the workforce have deteriorated, with the majority of the labour focusing on making money. The enormous growth in some specialisations, the mushrooming of continuing education courses, and the poor maintenance of their standards have all been highlighted as reasons why the workforce should have its own code of ethics. In addition, students who are well-qualified and of high caliber should be encouraged to pursue careers in the field. Like the dentists who came before them, many of the students entering dental schools did so merely because they wanted a dental education or an alternative to medicine.

ACTION FOR RESOLVING UTILIZATION PROBLEMS

1. Improving the delivery of oral health care systems.
2. Identifying the population's oral health care requirements and demands.
3. Careful planning and the establishment of realistic oral health objectives.
4. Ensuring that health professionals are adequately compensated.
5. Making the best use of auxiliary personnel and providing health education
6. Regular dental camps and the use of a mobile dental care office/unit
7. A shift in dentistry attitudes toward professionalism and social responsibility.
8. Proper resource development and utilization.

Teamwork and intersectoral coordination are essential for effective use of oral health care services. This can be accomplished by working together between the public and private spheres sector with government

assistance.¹⁴⁻¹⁷

INSTITUTIONS OF DENTISTRY

Adoption of a geographical area/ village/ school/ special centre such as old age homes, orphanages, etc. by dental institutions should be done. Satellite centres can be established in rural and underserved locations to give oral health care services to residents at no cost or at a reduced cost. The use of a mobile dentistry van can be done to reach out to far-flung locations. Dental workforce interns should be directed to conduct oral health awareness and preventive programmes, as well as this will help to build a community-oriented approach. Oral health education can be imparted by PHC health professionals and school teachers.^{17,18}

BODIES OF PROFESSIONALS

DCI should take the lead and implement competency-based, community-based training during an internship.¹⁹ IDA, local non-profits, and corporations companies should strive to invest a significant amount of money. Particular attention needs to be paid to oral health.¹⁸

GOVERNMENT

For remote areas, use the services of young graduates on a contract basis. The foundation of infrastructure improvements or dental clinics needs to be addressed at the PHC level. In India, however, there is no oral health policy. Although drafts have been created, they have not yet been implemented. As a result, there is a pressing demand for a separate budget and a national oral health policy and a budget for dental health. There is a need to reduce taxes on toothpaste and dental products to make them more accessible to the general public and dentists, lowering costs factor. Local production of these items is also a plus. Oral health should be a part of everyone's daily routine of general well-being among the general public.^{13,20,21,22}

CONCLUSION

There are numerous obstacles to expanding oral health care in India. The greatest difficulty is the lack of qualified dental health planners. Because there are no dentists in government decision-making organisations, dentistry is at the mercy of medical experts, who typically take the lion's share of the small funds sanctioned by the government for their own profession. Health education and the creation of an effective health-care system that is well-communicated are essential. There have been a slew of solutions proposed

to overcome these obstacles, but there is no data to back up their efficacy or cost-effectiveness.

REFERENCES

1. Guay AH. Access to dental care: solving the problem for underserved populations. J Am Dent Assoc. 2004; 135: 1599-605. <https://doi.org/10.14219/jada.archive.2004.0088>.
2. Owens PL, Kerker BD, Zigler E, Horwitz SM. Vision and oral health needs of individuals with intellectual disability. Ment Retard Dev Disabil Res Rev. 2006; 12: 28-40. <https://doi.org/10.1002/mrdd.20096>
3. Dietrich T, Culler C, Garcia RI, Henshaw MM. Racial and ethnic disparities in children's oral health: the National Survey of Children's Health. J Am Dent Assoc. 2008;139: 1507-17. <https://doi.org/10.14219/jada.archive.2008.0077>
4. Flores G, Tomany-Korman S C. The language spoken at home and disparities in medical and dental health, access to care, and use of services in US children. Pediatrics 2008;121: e1703-e1714. <https://doi.org/10.1542/peds.2007-2906>.
5. Conte M, Broder HL, Jenkins G, Reed R, Janal MN. Oral health, related behaviours and oral health impacts among homeless adults. J Public Health Dent. 2006; 66: 276-8. <https://doi.org/10.1111/j.1752-7325.2006.tb04082.x>.
6. Costa SM, Martins CC, Bonfim Mde L, et al. A systematic review of socioeconomic indicators and dental caries in adults. Int J Environ Res Public Health. 2012;9:3540-74. <https://doi.org/10.3390/ijerph9103540>
7. Dye BA, Arevalo O, Vargas CM. Trends in paediatric dental caries by poverty status in the United States, 1988-1994 and 1999-2004. Int J Paediatr Dent. 2010;20: 132-43. <https://doi.org/10.1111/j.1365-263X.2009.01029.x>
8. Skillman SM, Doescher MP, Mouradian WE, Brunson DK. The challenge to delivering oral health services in rural America. J Public Health Dent. 2010; 70 (Spec Iss): S49-S57. <https://doi.org/10.1111/j.1752-7325.2010.00178.x>
9. Jain VK, Sequeira P, Jain J, Chancy U, Maliyil MJ, Bhagwandas SC. Barriers in utilization of oral health care services among patients attending primary and community health centres in Virajpet, South Karnataka. Natl J Med Dent Res. 2013;1:39-47.
10. Assis MMA, Jesus WLA. Acesso aos serviços de saúde: abordagens, conceitos, políticas e modelo de análise. Ciência & Saúde Coletiva 2102; 17(11):2865-75. (In Portuguese). <https://doi.org/10.1590/S1413-81232012001100002>
11. Plamping D, Bewley R N, Gelbier S. Dental health and ethnicity. Br Dent J. 1985;158(7):261-3. <https://doi.org/10.1038/sj.bdj.4805585>

12. Parkash H, Duggal R, Mathur VP. Formulation of Guidelines for Meaningful and Effective Utilization of Available Manpower at Dental Colleges for Primary Prevention of Oro-dental Problems in the Country. A GOI- WHO Collaborative Programme, 2007:1-56.
13. Lal S, Paul D, Vashisht BM. National Oral Health Care Programme (NOHCP) implementation strategies. Indian J Community Med. 2004;29:3.
14. Tandon S. Challenges to the oral health workforce in India. J Dent Educ. 2004;68(7):28-33.
15. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century--the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol. 2003; 31:3-23.
16. Oral Health: ICMR Bulletin, Volume 24, April, 1994ICMR, New Delhi.
17. Bali RK, Mathur VB, Tewari A, Jayna P. National oral health policy for India formulated by Dental Council of India, 1994.
18. National oral health care programme implementation strategies, project of DGHS, MOH&FW. Govt. of India. Submitted by Hari Parkash, Project Director, Naseem Shah, Addl. Project Director, Department of Dental Surgery. AIIMS, Ansari Nagar, New Delhi.
19. Dental Council of India. Notification of revised regulations, 2007. Gazette of India 3rd amendment, October 9th, 2007
20. Lea, RA. World Development Report Investing in Health. Forum for Development Studies 1993;20(1):114-7. <https://doi.org/10.1080/08039410.1993.9665939>
21. Lal S, Mohan B, Punia MS. Health and Social Status of Senior Citizens in Rural Areas. The Indian Journal of Community Medicine 1997;9(3):10-17.
22. Kakatkar G, Bhat N, Nagarajappa R, Prasad V, Sharda A, Asawa K, et al. Barriers to the utilization of dental services in Udaipur, India. J Dent (Tehran) 2011;8:81-9.

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Tardive Akathisia in an Adult on Long Term Metoclopramide

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Metoclopramide is prescribed to subjects dealing with gastrointestinal issues like delayed gastric emptying, nausea, vomiting or loss of appetite. It is also used to treat chemotherapy and surgery related nausea and vomiting. Although it is very effective in targeting stomach related illnesses, severe adverse drug reactions can occur in those who take metoclopramide. This case report describes a 32-year-old female who suffered from tardive akathisia while being treated with long-term metoclopramide. Long term exposure to causative medication leads to evolution of Tardive akathisia and this can stay for a lifetime. It is important to restrict the exposure duration of triggering drug. Health care professionals and patients should be well aware of this neurological adverse event of metoclopramide.

KEYWORDS: Metoclopramide, Tardive Akathisia, Adverse Drug Reaction

INTRODUCTION

Metoclopramide is a peristaltic, antiemetic agent for short-term treatment of nausea connected with migraine, chemotherapy, radiotherapy and postoperative problems. The use of this drug is significantly more than domperidone and ondansetron. Metoclopramide is a dopamin-D₂-receptor antagonist, which at high concentrations also has a partial blocking and stimulating effect on serotonin 5-HT₃ and 5-HT₄-receptors. The therapeutic effect is achieved via receptors in the gastrointestinal tract, which causes increased intestinal motility, as well as via the chemoreceptor trigger zone in the central nervous system, whereby nausea is inhibited. Metoclopramide crosses the blood-brain barrier and can mediate dopamine receptor blockade in the basal ganglia with the risk of extrapyramidal side effects.¹ Although majority of adverse events of this drug like headache, diarrhea, restlessness and drowsiness are relatively minor, there are several that can be medically significant like confusion, irregularity in heartbeat, difficulty breathing, difficulty swallowing, seizures, tardive akathisia and dyskinesia, depression and suicidal tendencies. This drug has the potential to cause drug-induced movement disorders, including akathisia. which is characterized by an inner restlessness resulting in a need for constant movement. We hereby report a case wherein the subject developed severe symptoms that were consistent with tardive akathisia after seven months of metoclopramide

treatment.

MEDICAL HISTORY

A 32-year-old woman presented with palpitation, agitation and restlessness. She is a home maker, married and living with her husband in a metropolitan city, belonging to upper middle socio-economic status. Her medical history was significant for gall bladder removal after which she suffered from pain in the epigastric region along with other symptoms consistent with gastroesophageal reflux disease (GERD). She was given IV fluids and started with daily metoclopramide treatment giving good effect. She stayed in the hospital for a day and was discharged owing to relief in her symptoms. Except this she had no other relevant medical history, no pregnancy, no other comorbid conditions and also denied any incidence of drug allergy. After seven months of fixed treatment, however, she began feeling an inner sense of restlessness along with agitation and palpitations and stopped taking the medication on her husband's suggestion. Her symptoms worsened and her condition deteriorated significantly. She experienced constant inner restlessness, urge to move, motor turmoil and chills that occurred spontaneously or were triggered by light touch. She regarded these movements to be happening spontaneously and claimed to have no control. She was cooperative, alert and oriented in relation to time and place. She responded well to our



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questions but was a bit slow in doing this. She was anxious but showed a good general judgment. In her entire life, she had never encountered any kind of psychological or neurological issues. Also, she had never been administered metoclopramide or related drugs before gall bladder removal. She underwent a thorough investigation in the areas of neurology, endocrinology and internal medicine, but appeared to be neurological and motorically unremarkable. Objective and paraclinical examinations, including MRI scan of the cerebrum, as well as determination of the levels of plasma methanephtrines, thyroid-stimulating hormone and 5-hydroxyindol acetate showed nothing abnormal. Finally, the ongoing symptoms were assessed to be consistent with tardive akathisia secondary to long-term metoclopramide treatment. The subject and her husband were informed about the possible role of metoclopramide in her condition. Initially, metoclopramide treatment was stopped but there was no significant improvement in her symptoms. Later, intravenous midazolam treatment was started. Ten days later, the improvement in her anxiety level and involuntary movements was significant. Subsequently, midazolam was gradually stopped within a few days. One week after stopping midazolam, there was no recurrence of tardive akathisia symptoms. Her GERD medication has been replaced. We avoided trying metoclopramide again to avoid any kind of positive rechallenge. The subject was followed up after 1 month via a telephonic conversation with no complaints of tardive akathisia anymore.

DISCUSSION

Akathisia, which may occur as a side effect of treatment with dopamine receptor antagonists, is characterized by a feeling of inner restlessness and discomfort, as well as repetitive movements and a lack of ability to sit and stand still or unpleasant, often burning sensations in specific parts of the body.² The condition is severely painful, but often remains undiagnosed or mistaken with anxiety/depression, because there is a lack of consensus on the diagnostic criteria.^{2,3} The term acute akathisia is used when the symptoms occur within days after exposure to a relevant drug and is a short-term condition that disappears upon the discontinuation of treatment. On the other hand, tardive akathisia occurs after prolonged exposure and may persist after discontinuation of the drug. Tardive akathisia belongs to the group of tardive syndromes, which also covers other movement disorders, including tardive dyskinesia and tardive tremor.² The absolute risk of

developing tardive syndromes when using metoclopramide is unknown, but in several studies an estimated risk of up to 15% has been found.^{1,3} Duration and dose are considered to be of great importance, just like patient-related factors such as female gender, old age, chronic diseases as well as the use of alcohol, tobacco and other neuroleptics, which increase the risk of the above.^{1,4} The primary action in the treatment is to discontinue the triggering substance. A slow phasing out is recommended, as sudden discontinuation may worsen or even trigger tardive syndromes.² This could be due to the hypersensitivity of the dopamine receptors after blockade, but the pathophysiology is not fully clarified.^{1,2} Despite discontinuation of treatment, the symptoms may persist for years, or can be potentially lifelong.⁴ However, it is suggested that the condition often improves over time. The remission rate in previous studies varies greatly, between 2% and 33%. Young age and early diagnosis and discontinuation of the triggering drug probably improve the prognosis.⁴ Tardive akathisia often does not respond to medical treatment, but treatment with tetrabenazine, which is a benzoquinolizine derivative with antihyperkinetic effect, is attempted in some persistent and disabling cases. However, the documentation of the efficacy of the above is sparse.^{2,4}

CONCLUSION

Tardive akathisia is a disabling, often overlooked syndrome that may occur as a side effect of taking dopamine receptor antagonists. Metoclopramide should only be used for a short period of time, and special caution should be exercised when treating elderly and chronically ill patients, and the risk of neurological side effects should be kept in mind.

REFERENCES

1. Rao AS, Camilleri M. Review article: metoclopramide and tardive dyskinesia. *Aliment Pharmacol Ther.* 2010;31(1):11-9. <https://doi.org/10.1111/j.1365-2036.2009.04189.x>.
2. Fahn S, Jankovic J, Hallett M. Principles and practice of movement disorders: the tardive syndromes: phenomenology, concepts on pathophysiology and treatment, and other neuroleptic-induced syndromes. 2nd ed, Saunders, Philadelphia 2011. p.415.
3. Wijemanne S, Jankovic J, Evans RW. Movement Disorders From the Use of Metoclopramide and Other Antiemetics in the Treatment of Migraine. *Headache.* 2016;56(1):153-61. <https://doi.org/10.1111/head.12712>.
4. Zutshi D, Cloud LJ, Factor SA. Tardive Syndromes are Rarely Reversible after Discontinuing Dopamine

Receptor Blocking Agents: Experience from a University-based Movement Disorder Clinic. Tremor Other Hyperkinet Mov (NY). 2014 Oct 23;4:266. <https://doi.org/10.7916/D8MS3R8C>.

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Reducing “Screen-Time” and Promoting Self Care Activities among Overweight and Obese Pre-Adolescents: A Randomized Controlled Trial

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INTRODUCTION: Pediatric obesity has been considered as one of the most serious public health challenges in the world.

AIM: To reduce “Screen-time” and promoting self care activities among overweight and obese pre-adolescents (aged 10-12 years) in India through proper intervention measures.

MATERIALS AND METHOD: Designed as a two-armed randomized controlled trial, 537 pre-adolescents aged 10-12 years were enrolled in this online study. Data was collected through a questionnaire (containing close-ended 26 questions). Pre- adolescents, whose BMI was classified as “overweight” and “obese” were enrolled and randomly assigned (flip of coin) to the intervention group and control group. The intervention group were then given monthly online one-on-one sessions (to maintain confidentiality) by five standardized instructors. The study lasted for four months and a total of four individual sessions were provided to each child in the intervention group. Data was transferred into Excel for descriptive statistics, and analysed using SPSS version 22.0 using the paired t-test and multi variate logistic regression was applied keeping the significance value of $p \leq 0.05$

RESULTS: A total of 537 pre- adolescents met the inclusion criteria. Among them, 270 (50.3%) belonged to the intervention group and 267 (49.7%) belonged to the control group. Majority of the pre- adolescents were males (59.4%). In the intervention group, there were 61.8% overweight pre-adolescents, which reduced to 42.9%, while in the control group, there were 89.5% overweight pre-adolescents, which reduced 9.8% and the difference between both the groups was observed to be significant ($p=0.02$).

CONCLUSION: Techniques used in the intervention group led to positive outcomes like weight loss and reduced screen time among the pre-adolescents which in turn, helped reduce the global burden of disease.

KEYWORDS: Obesity, Adolescents, Body Mass Index (BMI)

INTRODUCTION

The epidemic of Pediatric obesity has been termed as “one of the most serious public health challenges of the 21st century” by the WHO.¹ Pre- adolescents, who serve as the future of any nation, are threatened by this epidemic. A presence of any preventable morbidity in these pre-adolescents can affect their overall general health which in turn increases the global burden of disease. As per a report by WHO, the prevalence of obesity among pre-adolescents and adolescents aged 5-19 years increased a whopping four times in between 1975 to 2016.²

Sadly, there are two key contributors to obesity among pre- adolescents: poor diet and lack of physical activity which have led to preventable deaths, chronic disease(s), and economic health burden(both on the society as well as families).^{3,4} These two factors can be attributed to urbanization, as it leads to higher consumption of junk food and sedentary behavior.⁵ In addition, the onset of COVID-19 led to lockdowns and closure of schools, due to which pre-adolescents were forced to stay in their homes and attend classes online, which led to lesser physical activity.

Due to constant online activities, there is a risk of “Internet addiction”, a relatively new form of dependency among pre-adolescents reported by the scientific community.⁶ The health effects of this addiction can have both mental and physical and both pre-adolescents and parents need to be aware that there is a need to “reduce screen time” and promote more physical activity. A healthy body is a gateway to systemic health As well as the bright future of the nation.

Due to the risk of obesity among pre-adolescents, a randomized controlled trial was undertaken to reduce “screen-time” and promoting self care activities among overweight and obese pre-adolescents (aged 10-12 years) in India through proper intervention measures.

MATERIAL AND METHODS

The present study was designed as a two-armed randomized controlled trial, and after receiving an ethical approval, pre-adolescents (aged 10-12 years) were enrolled after taking their consent as well as their parent’s/guardians consent to participate in the study.



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Participation was voluntary, and those enrolled were free to leave the study as per their wish. Enrolled pre-adolescents were based within India and participation links were shared with close associates (snowball sampling) as well on various online platforms. The enrolment period lasted for three weeks.

The study was conducted online, wherein after obtaining an online consent, data (self-reported) was collected through a questionnaire, which included the demographic data, height/weight, hours spent on pursuing physical activities at home, as well as time spent in front of the screen (Mobile/TV/Laptop). All questions were close-ended in nature. The questionnaire was tested on 20 pre-adolescents, whose results were not included in the present study. A total of 26 questions (in English language) were present in the questionnaire and it approximately took four minutes to complete.

Based on the inputs of the pre-adolescents, whose BMI was classified as “overweight” and “obese” were enrolled and randomly assigned (flip of coin) to the intervention group and control group. The intervention group were then given monthly online one-on-one sessions (to maintain confidentiality) by five standardized instructors. The study lasted for four months and a total of four individual sessions were provided to each child in the intervention group. The pre-adolescents were then again asked to fill the questionnaire. Access to data was only with the primary investigator who transferred the data into Excel, coded it and sent to the statistician for analysis using SPSS version 22.0. The tests applied were the paired t-test and multivariate logistic regression was applied keeping the significance value of p as ≤ 0.05 .

RESULTS

The demographic details of the pre-adolescents is depicted in table 1. Of a total of 1013 responses received, a total of 537 (inclusion rate: 53.01%) pre-adolescents met the inclusion criteria. Among them, 270 (50.3%) belonged to the intervention group and 267 (49.7%) belonged to the control group. Majority of the pre-adolescents were males (59.4%).

In the intervention group, there were 61.8% overweight pre-adolescents, which reduced to 42.9%, while in the control group, there were 89.5% overweight pre-adolescents, which reduced 9.8% and the difference between both the groups was observed to be significant ($p=0.02$). Interestingly, in the control group, it was observed that only two (0.7%) students became underweight and one (0.4%) had a healthy BMI after completion of the study; in comparison, in the control group, ninety one (33.7%) of the participants had achieved a healthy BMI ($p=0.03$). The median height was found to be 139.3 cm (pre-intervention group) and 140 cm (Control group) and the difference was found to be non-significant.

The median time spent on various activities and diet control by the pre-adolescents in depicted in table 2. Significant reduction in time spent on phone were observed, followed by an increased time spent on self-care activities and exercise in the intervention group. In the control group, the little changes were seen in their patterns and all changes were found to be insignificant. In the intervention group, diet control increased from 30% to 37.4% ($p=0.02$), an overall positive change in the pre-adolescents belonging to the intervention group was observed.

	INTERVENTION GROUP		CONTROL GROUP		p Value
Gender					-
Males	167(61.9%)		152(56.9%)		
Females	103 (38.1%)		115 (43.1%)		
Total	270 (50.3%)		267 (49.7%)		
	PRE-INTERVENTION	POST-INTERVENTION	BASELINE	POST STUDY PERIOD	
Body Mass Index					
Underweight (<18.5)	00(0%)	06(2.2%)	00(0%)	02(0.7%)	0.88
Healthy (18.5-25)	00(0%)	91(33.7%)	00(0%)	01(0.4%)	0.03*
Overweight (25-<30)	167 (61.8%)	137(42.9%)	28(10.5%)	26(9.8%)	0.54
Obese (>30)	103 (38.2%)	36(21.2%)	239(89.5%)	238(89.1%)	0.02*
Median Height (in cms)	139.3		140.0		NS
Median Weight (in kg)	38.6	33.6	34.1	34.2	NS

Table 1. Demographic Details of the Pre-Adolescents

	INTERVENTION GROUP		CONTROL GROUP		p-Value
	Pre-Intervention (median \pm SD)	Pre-Intervention Median \pm SD)	Baseline	Study completion	
Time Spent on Phone (in hours)	6 \pm 1.2	5.4 \pm 2.1	6 \pm 2.3	5.9 \pm 3.2	0.01*
Helping in household chores	.34 \pm 0.33	2.3 \pm 1.1	.7 \pm 1.4	.6 \pm 1.2	0.05
Self-Care Activity	.1 \pm 0.2	1.1 \pm 0.64	2.1 \pm 3.2	2.4 \pm 2.2	0.02*
Exercise	1.0 \pm 0.56	2.1 \pm 1.0	1.3 \pm 0.56	2.2 \pm 1.1	0.08
Diet Control					
Yes	81 (30%)	101 (37.4%)	121 (45.3%)	122 (45.6%)	0.02*
No	189 (70%)	169 (62.6%)	146 (54.7%)	145 (54.4%)	0.88

Table 2. Median Time Spent on Various Activities and Diet Control by the Pre-Adolescents

The results of the multivariate logistic regression stated that reduced screen time was significantly associated with weight reduction ($p=0.01$) and physical activity($p=0.04$) among pre-adolescents in the intervention group; encouraging the use of such intervention programmes in the future (Table 3).

SCREEN TIME	SCREEN TIME	WEIGHT REDUCTION	PHYSICAL ACTIVITY
Screen time	a*	0.01	0.04
Weight Reduction	0.01	a*	0.01
Physical Activity	0.08	.0.01	a*

Table 3. Multivariate Logistic Regression between Screen Time, Weight Reduction and Physical Activity (a*: Constant)

DISCUSSION

The ongoing pandemic has been quite hard on school attending students. As the world slowly prepared to unlock and return to normalcy, the decision on keeping schools closed is perhaps, in the best interest of the students. However, confined to the walls of their homes, these students who were once overtly active have been made to sit and attend online classes and limit their physical activity, which in turn has probably increased their snacking due to constant availability of food.

It has also been reported that obesity is identified as an independent risk factor for COVID-19 disease severity and obese children may experience a more severe COVID-19 trajectory which might include the need for respiratory support.⁷ The overall obesity of 53.01% was high as compared to pre-covid era estimations of 19.3%⁸ and ~7–8%,⁹ respectively.

In the present study, significant reductions in weight (61.8% to 42.9%) and obesity (38.2% to 21.2%) was observed among pre-adolescents and the findings are similar to trials conducted by Aguilar-Cordero MJ et al.¹⁰ and Larsen LM et al.¹¹ Many outcomes data have been reported from research studies that have examined exercise alone, exercise plus dietary restriction, or dietary restriction alone to determine strategies for weight loss. In line with the intervention strategies adopted by the present study, Donnelly et al. demonstrated weight loss with exercise in a group of 141 overweight or obese (BMI ≥ 31 kg/m²) men and women in the Midwest Exercise Trial 2; the amount of activity to achieve this weight loss was again greater than the general exercise recommendations for health.

Diet control increased from 30% to 37.4% in the intervention group and scientific evidence states it is important to recognize the challenge of monitoring dietary intake and exercise intensity and duration over the long term. In contrast to popular belief, the evidence linking exercise and its contribution to significant weight loss and further weight maintenance is not firmly established; and diet control plays an important role in the same.¹² We hypothesise that as a result of staying at home due to the pandemic, the pre-adolescents they were tempted to eat junk/high cholesterol preparations made at home and hence, could not follow proper diet control.

The inclusion of a control group helped compare and analyze the effectiveness of the interventions. In good interests of the control group, the results of the present study was shared by them online by the primary investigator (41.0% attendance rate) and they were encouraged to take up remedial measures to prevent weight related issues in them. The control group shall be followed up after six months again to assess their

progress. Due to the self-reported nature of the data, there could be a probability of under/over reporting of the data by the respondents, but it was addressed by ensuring complete confidentiality of the data to the parents and the children. Due to the pan India presence of the study and the tests applied, we can safely state that the results of the present study can be generalized for other populations.

CONCLUSION

The various techniques used in the intervention group led to positive outcomes like weight loss and reduced screen time among the pre-adolescents which in turn, helped reduce the global burden of morbidity. We recommend the need for further studies using the same intervention techniques and methodology by colleagues so that the findings of the present study can be further strengthened/refuted through their valuable findings.

REREFENCES

1. Romanelli R, Cecchi, N, Carbone MG, Dinardo M, Gaudino G, del Giudice EM, et al. Pediatric obesity: prevention is better than care. *Ital J Pediatr*. 2020;46:103. <https://doi.org/10.1186/s13052-020-00868-7>
2. WHO. Obesity and overweight. (Online Article). Available from: https://www.who.int/health-topics/obesity#tab=tab_1. [Last Accessed 17th January, 2021].
3. Friedemann C, Heneghan C, Mahtani K, Thompson M, Perera R, Ward AM. 2012. Cardiovascular disease risk in healthy pre-adolescents and its association with body mass index: systematic review and meta-analysis. *BMJ : British Medical Journal* 2012;345:e4759. <https://doi.org/10.1136/bmj.e4759>
4. Hamilton D, Dee A, Perry IJ. 2018. The lifetime costs of overweight and obesity in childhood and adolescence: a systematic review. *Obesity Reviews* 19: 452–63.
5. Popkin BM, Gordon-Larsen P. The nutrition transition: worldwide obesity dynamics and their determinants. *Int J Obes Relat Metab Disord*. 2004;28(Suppl 3):S2–9
6. Moreno M, Jelenchick L, Christakis D. Problematic internet use among older adolescents: A conceptual framework. *Computers and Human Behavior*. 2013;1879–87.
7. Lighter J, Phillips M, Hochman S, Sterling S, Johnson D, Francois F, Stachel A. Obesity in patients younger than 60 years is a risk factor for Covid-19 hospital admission. *Clinical Infectious Diseases*. 2020 2020:ciaa415. <https://doi.org/10.1093/cid/ciaa415>.
8. Ranjani H, Mehreen T S, Pradeepa R, Anjana RM, Garg R, Anand K, Mohan V. Epidemiology of childhood overweight & obesity in India: A systematic review. *Indian J Med Res*. 2016;143:160–74. <https://doi.org/10.4103/0971-5916.180203>
9. Nguyen PH, Scott S, Headey D, Singh N, Tran LM, Menon P, et al. (2021) The double burden of malnutrition in India: Trends and inequalities (2006–2016). *PLoS ONE* 16(2): e0247856. <https://doi.org/10.1371/journal.pone.0247856>
10. Aguilar-Cordero MJ, Rodríguez-Blanque R, Leon-Ríos X, Expósito Ruiz M, García García I, Sánchez-López AM. Influence of Physical Activity on Blood Pressure in Children With Overweight/Obesity: A Randomized Clinical Trial. *Am J Hypertens*. 2020;33(2):131–6. <https://doi.org/10.1093/ajh/hpz174>.
11. Larsen LM, Hertel NT, Mølgaard C, Christensen RD, Husby S, Jarbøl DE. Early intervention for childhood overweight: A randomized trial in general practice. *Scand J Prim Health Care*. 2015;33(3):184–90. <https://doi.org/10.3109/02813432.2015.1067511>.
12. Cox CE. Role of Physical Activity for Weight Loss and Weight Maintenance. *Diabetes Spectr*. 2017;30(3):157–60. <https://doi.org/10.2337/ds17-0013>.

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Tobacco Habits, Oral Mucosal Lesions and Counselling Provided to Support Staff of Educational Institutions Situated in Greater Noida, Uttar Pradesh, India: A Cross-Sectional Study

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INTRODUCTION: Tobacco has approximately one billion users and claims the life of one person every six seconds on an average.

AIM: To assess the tobacco habits and related oral mucosal lesions and tobacco cessation counselling provided to the support staff of various educational institutions located in Greater Noida, Uttar Pradesh, India.

MATERIALS AND METHOD: Data was collected in two steps. The first step included data collection using the Global Adult Tobacco Survey (GATS), 2011 which was modified according to the needs of the population. The second step included recording of Oral Mucosal Lesions through the "Oral Mucosa" component of the WHO Oral Health Assessment Form (1997) by a standardized investigator. Data was tabulated and the student's t-test and Spearman's correlation were applied to find out significant associations, if any. Data was analysed using SPSS version 21.0 and significance (p) was kept significant at ≤ 0.05 .

RESULTS: Tobacco consumption in any form was found in 47.1% subjects consisting of 37 males (90.2%) and 4 females (9.8%). Smoking was found in 16 subjects (18.4%) comprising of 13 males (14.9%) and 3 females (3.4%). Lesions were observed in 58.5% of the population, with the most common lesion being leucoplakia (27%), followed by any other lesion (24%) and malignant lesions (7%). A positive correlation was observed in three variables; the first being an increased willingness to quit with increased current consumption ($r=0.67$), followed by willingness to quit due to presence of a lesion ($r=0.71$) and willingness to quit due to provision of any type of counselling ($r=0.70$).

CONCLUSION: It is important that efforts are directed towards reducing and subsequently eliminating tobacco consumption among support staff of various educational schools who have a high percentage of tobacco intake.

KEYWORDS: Tobacco, Cessation, Relapse

INTRODUCTION

Tobacco, the widely recognised epidemic, has more than one billion users and its use claims an average of one person every six seconds and also accounts for one in 10 adult deaths worldwide globally. It finds itself as risk factor for six of the eight leading cause of deaths across the world. This killer disease has its most of its users low-and middle-income countries, and especially in rural areas of India, where the use of bidi and smokeless tobacco is quite prevalent.^{1,2} Various authors have studied its deleterious effects on the health of individuals, and it shows variation in its use according to area and gender.^{3,4,5}

Tobacco use in any form has deleterious effects on the body and it affects the oral cavity, causing oral cancer and various premalignant lesions and conditions. It also affects the heart, liver and lungs, and has been acknowledged as a major risk factor for heart attacks, strokes and various diseases involving the respiratory system e.g. (COPD, Bronchitis, emphysema, etc).

In India, data on oral lesions as a result of tobacco habits varies from area to area and it varies from 26.8%⁶ and 41.2%⁷ in South India to 30.03%⁸ amongst

fishermen in Gujarat to 16.8%⁹ amongst patients visiting a dental college in Northern India and it reflects the different kinds of tobacco consumptions and habits prevalent in various parts of India.

The support staff (peons, drivers, mess workers, sweepers, gatekeepers, assistants) are an essential part in the overall functioning of all educational institutions. However, it is observed that little or no importance is paid on their overall and tobacco habits. Hence, this study aims to assess the tobacco habits and related oral mucosal lesions and tobacco cessation counselling provided to the support staff of various educational institutions located in Greater Noida, Uttar Pradesh, India.

MATERIALS AND METHOD

A cross-sectional study was conducted on support staff (peons, drivers, mess workers, sweepers, gatekeepers, assistants) of various educational institutions situated in Greater Noida, Uttar Pradesh and willing to participate in the study and not having any formal dental education (degree/diploma) were included in the study. Prior to the commencement of the study, an

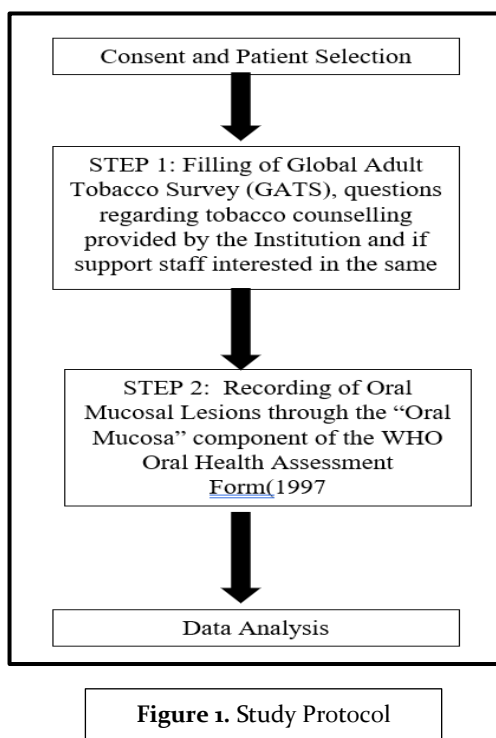


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ethical clearance was duly taken from the institution where the study was being conducted. The study was conducted from 1st January, 2018 to 31st March, 2019 and willing participants were requested to sign a consent form that was written in Hindi, which was the native language of the support staff. A total of 87 subjects (55 males, 32 females) were selected through convenience sampling.

Data was collected in two steps. The first step included entering data in the Global Adult Tobacco Survey (GATS), 2011 which was modified according to the needs of the population and an additional questionnaire that asked whether the college provided any tobacco cessation counselling to them and if the support staff was interested in the same (figure 1). The questionnaire were both pre-validated and pre-tested prior to data collection.



The second step included recording of Oral Mucosal Lesions through the “Oral Mucosa” component of the WHO Oral Health Assessment Form(1997)¹¹ by the investigator himself, who was calibrated by prior to commencement of the study.

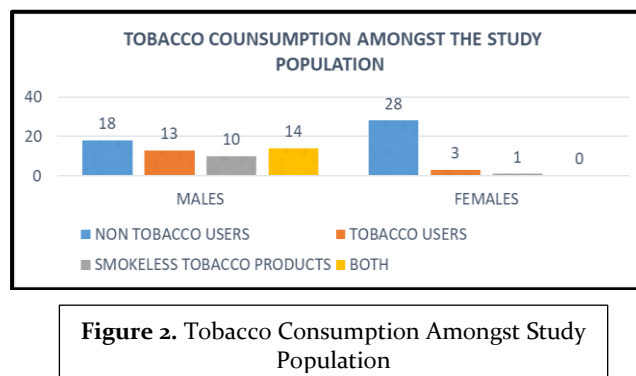
A pilot study was conducted amongst five subjects to validate the questionnaires and make subsequent adjustments. The data of these subjects was analysed

with the main study participants and not included in the final analysis.

Data was tabulated and the student’s t-test and Spearman’s correlation were applied to find out significant associations, if any. Data was analysed using SPSS version 21.0 and significance (p) was kept significant at ≤ 0.05 .¹²

RESULT

The support staff belonging to various educational schools in Greater Noida comprised of 87 subjects (55 males, 32 females), and a tobacco consumption habit in any form, was found in 41(47.1%) subjects which consisted of 37 males (90.2%) and 4 females (9.8%). The prevalence of smoking in this present study was found in 16 subjects (18.4%) comprising of 13 males (14.9%) and 3 females(3.4%) (figure 2).



It was revealed that among smokers, there were 12.2% past smokers, and 17.1% past smokeless tobacco users. An encouraging 39% attempted to quit at some time, yet only 29.7% males and 2.4% females received any cessation advice from a doctor($p=0.01$). Significant differences among 24.4% males and 2.4% females was observed when asked whether they were thinking to quit smoking due to the warnings given on the packs (table 1)

The prevalence of lesions among the tobacco users is depicted in figure 3. Lesions were observed in 58.5% of the observed population, with the most common lesion being leucoplakia (27%), followed by any other lesion (24%) and malignant lesion [(oral cancer, 7%), figure 3]

A total of 20 males (36.3%) ever attended any tobacco cessation counselling, while only 9 (28.1%) females reported having undergone any type of tobacco cessation counselling (figure 4). Interestingly, 50 males

QUESTION	TOBACCO USERS	
	MALES(n,%)	FEMALES(n,%)
1. Past smokers	5(12.2)	0
2. Past smokeless tobacco users	7(17.1)	0
3. Attempts to quit smoking (last 12 months)	16(39)	0
4. Received cessation advice from doctor	12(29.7)	1(2.4)
5. Visits to dentist/doctor in the past 12 months	14(34.2)	6(14.6)
6. Would it help to quit the habit if tobacco counselling is provided by the institution?	26(63.4)	3(7.3)
7. Noticing health warnings on tobacco/bidi packs?	13(31.7)	2(4.9)
8. Thinking about quitting because of warnings	10(24.4)	1(2.4)

Table 1. Information Regarding Smoking History among the Subjects

and 23 females reported that they would like to attend/re-attend another counselling and the difference was found to be statistically significant ($p=0.03^*$).

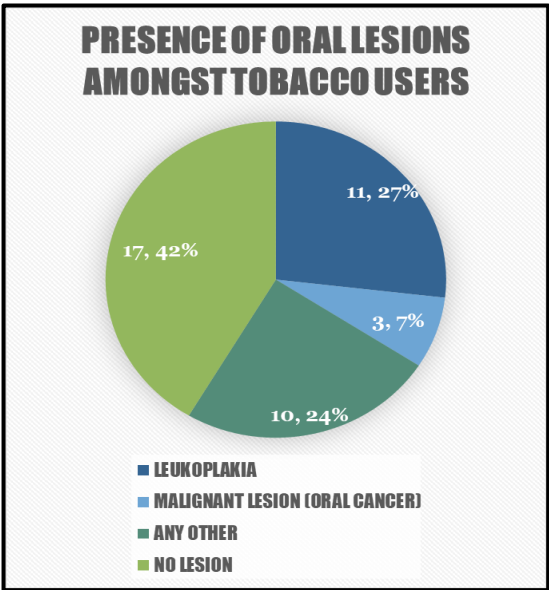


Figure 3. Person/source from Which the 29 Tobacco Users Received their Counselling

When asked about the person/source from which the twenty nine study subjects received their counselling, it was revealed that most counsellings (41%) were provided by the dentist, followed by NGO's (28%) and students(14%). 17% of the subjects reported attending a common health talk given by various organizations with no focus on individuals. No significant differences were observed while comparing the above-mentioned data (figure 5).

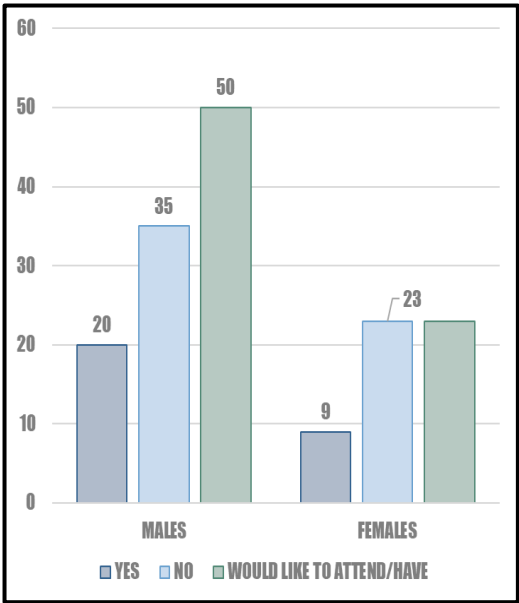


Figure 4. Tobacco Cessation Counselling among the Subjects

Upon application of the Spearman's Correlation, a positive correlation was observed in three variables; the first being an increased willingness to quit with increased current consumption ($r=0.67$), followed by willingness to quit due to presence of a lesion ($r=0.71$) and willingness to quit due to provision of any type of counselling ($r=0.70$), (table 2).

DISCUSSION

As per the results of the present study, tobacco consumption habit in any form, was found in 47.1% subjects and this is lesser as compared to the reported prevalence of any tobacco use by Bhan N. and colleagues which remained between 61.5% to 62.7% among people belonging to low socio-economic status.¹³ Although bidi smoking is on the decline, higher odds of bidi smoking were found among males, older people, and among those belonging lower socioeconomic status. Another factor for the uptake of bidi smoking is its easy availability and its lower cost.

The prevalence of smoking in this present study was found observed in 18.4% of the subjects and is lower in comparison to Garrett BE et al.,¹⁵ who reported 31.6% smoking prevalence among people with no high school diploma; and in agreement to Jindal SK et al. who reported a prevalence of 15.6% ever smokers.¹⁶

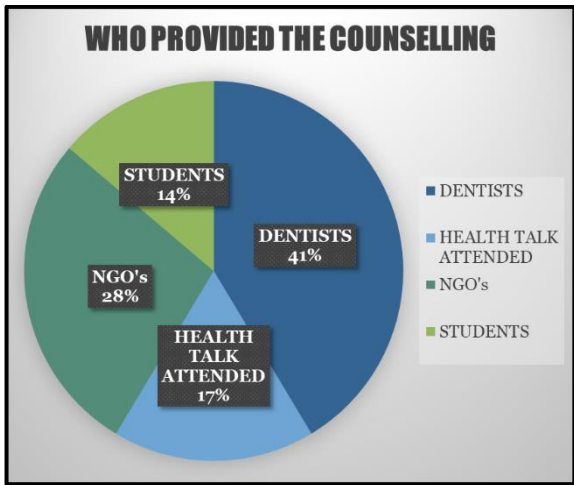


Figure 5. Tobacco Cessation Counselling among the Subjects

It was observed that 39% of the subjects attempted to quit smoking in the last 12 months; yet were unable to do so. These findings are in agreement to Kar SS et al.,¹⁷ who reported a willing to quit all forms of tobacco in 52.2% of their study population. In addition, Srivastava S et al. reported that among 42% of people who made an attempt to quit tobacco; only 42% were successful in doing so; leading to a relapse in 58% of tobacco users.¹⁸ Nicotine dependency among the people needs to be addressed properly and it is possible that due to the low socio economic status, these people cannot afford to purchase Nicotine Replacement Therapy (NRT) or any other means of medication to help quit this habit. Also, the nature of their job also promotes them to increase their tobacco uptake to relieve stresses associated with it.

VARIABLE	r
Willingness to quit * current consumption	0.67
Presence of Lesion * Willingness to quit	0.71
Counselling (Any type) * Willingness to quit	0.70

Table 2. Spearman's Correlation in Relation to Willingness to quit and Other Variables

Among the 33% of males and females who attended any form of health education, only 13.8% successfully quit the habit. Further efforts should be made to make the current smokers understand that smoking cessation is proven to decrease anxiety, stress, or depression and also improve the quality of life among tobacco users compared with those who continued to smoke tobacco.¹⁹

Oral lesions were observed in 58.5% of the subjects in the present study, with the most common being leukoplakia (27%). These findings were lower as compared to 73.8% of oral lesions observed by Chandra P et al.²⁰ and higher as compared to the findings of Aslesh OP et al.(36.3%).²¹ Variations in such percentages can be attributed to personal, geographical and religious preferences in tobacco intake among people.

CONCLUSION

As per the study results, it is important that efforts are directed towards reducing and subsequently eliminating tobacco consumption among support staff of various educational institutions who have a high percentage of tobacco intake. Tobacco cessation programmes (both governmental and non-governmental) should also include and focus such population to reduce the global burden of disease.

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REFERENCES

1. World Health Organisation. Tobacco Free Initiative (TFI): Tobacco facts. (Online Article). Available at: <http://www.who.int/tobacco/mpower/tobaccofacts/en/>. [Last accessed on 15th December. 2020]
2. Sinha DN, Gupta PC, Pednekar MS. Tobacco Use In A Rural Area Of Bihar, India. Indian Journal of Community Medicine 2003;28(4):167-70.
3. Chinwong D, Mookmanee N, Chongpornchai J, Chinwong S. A Comparison of Gender Differences in Smoking Behaviors, Intention to Quit, and Nicotine Dependence among Thai University Students. J Addict. 2018 Oct 24;2018:8081670. <https://doi.org/10.1155/2018/8081670>.
4. Smith PH, Bessette AJ, Weinberger AH, Sheffer CE, McKee SA. Sex/gender differences in smoking cessation: A review. Prev Med. 2016;92:135-40. <https://doi.org/10.1016/j.ypmed.2016.07.013>.
5. Yue Y, Hong L, Guo L, Gao X, Deng J, Huang J, et al. Gender differences in the association between cigarette

- smoking, alcohol consumption and depressive symptoms: a cross-sectional study among Chinese adolescents. *Sci Rep.* 2016;5:17959. <https://doi.org/10.1038/srep17959>
6. Patil PB, Bathi R, Chaudhari S. Prevalence of oral mucosal lesions in dental patients with tobacco smoking, chewing, and mixed habits: A cross-sectional study in South India. *J Family Community Med.* 2013;20(2):130-5. <https://doi.org/10.4103/2230-8229.114777>
 7. Mathew AL, Pai KM, Sholapurkar AA, Vengal M. The prevalence of oral mucosal lesions in patients visiting a dental school in Southern India. *Indian J Dent Res.* 2008;19(2):99-103.
 8. Chandroth SV, Venugopal HK, Puthenveetil S, Jayaram A, Mathews J, Suresh N et al. Prevalence of oral mucosal lesions among fishermen of Kutch coast, Gujarat, India. *Int Marit Health.* 2014;65(4):192-8. <https://doi.org/10.5603/IMH.2014.0037>.
 9. Bhatnagar P, Rai S, Bhatnagar G, Kaur M, Goel S, Prabhat M. Prevalence study of oral mucosal lesions, mucosal variants, and treatment required for patients reporting to a dental school in North India: In accordance with WHO guidelines. *Journal of Family & Community Medicine* 2013;20(1):41-48. <https://doi.org/10.4103/2230-8229.108183>.
 10. Global Adult Tobacco Survey Collaborative Group. Tobacco Questions for Surveys: A Subset of Key Questions from the Global Adult Tobacco Survey (GATS), 2nd Edition. Atlanta, GA: Centers for Disease Control and Prevention, 2011
 11. World Health Organization. (1997). Oral health surveys : basic methods, 4th ed. World Health Organization. <https://apps.who.int/iris/handle/10665/41905>
 12. IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.
 13. Bhan N, Karan A, Srivastava S, Selvaraj S, Subramanian SV, Millett C. Have Socioeconomic Inequalities in Tobacco Use in India Increased Over Time? Trends From the National Sample Surveys (2000-2012). *Nicotine Tob Res.* 2016;18(8):1711-8. <https://doi.org/10.1093/ntr/ntw092>.
 14. Mbulo L, Palipudi KM, Smith T, Yin S, Munish VG, Sinha DN, Gupta PC, Swasticharan L. Patterns and related factors of bidi smoking in India. *Tob Prev Cessat.* 2020;6:28. <https://doi.org/10.18332/tpc/119053>.
 15. Garrett BE, Martell BN, Caraballo RS, King BA. Socioeconomic Differences in Cigarette Smoking Among Sociodemographic Groups. *Prev Chronic Dis.* 2019;16:180553. <http://doi.org/10.5888/pcd16.180553>
 16. Jindal SK, Aggarwal AN, Chaudhry K, Chhabra SK, D'Souza GA, Gupta D, et al. Asthma Epidemiology Study Group. Tobacco smoking in India: prevalence, quit-rates and respiratory morbidity. *Indian J Chest Dis Allied Sci.* 2006;48(1):37-42.
 17. Kar SS, Sivanantham P, Rehman T, Chinnakali P, Thiagarajan S. Willingness to quit tobacco and its correlates among Indian tobacco users-Findings from the Global Adult Tobacco Survey India, 2016-17. *J Postgrad Med.* 2020;66(3):141-148. https://doi.org/10.4103/jpgm.JPGM_408_19.
 18. Srivastava S, Malhotra, S., Harries, A.D. et al. Correlates of tobacco quit attempts and cessation in the adult population of India: secondary analysis of the Global Adult Tobacco Survey, 2009-10. *BMC Public Health* 13, 263 (2013). <https://doi.org/10.1186/1471-2458-13-263>
 19. Reddy MM, Kanungo S, Naik BN, Kar SS. Willingness to quit tobacco smoking and its correlates among Indian smokers – Findings from Global Adult Tobacco Survey India, 2009-2010. *J Family Med Prim Care* 2018;7:1353-60. https://doi.org/10.4103/jfmprc.jfmprc_169_18
 20. Chandra P, Govindraju P. Prevalence of oral mucosal lesions among tobacco users. *Oral Health Prev Dent.* 2012;10(2):149-53.
 21. Aslesh OP, Paul S, Paul L, Jayasree A K. High Prevalence of Tobacco Use and Associated Oral Mucosal Lesion Among Interstate Male Migrant Workers in Urban Kerala, India, *Int J Cancer Manag.* 2015 ; 8(6):e3876. <https://doi.org/10.17795/ijcp-3876>.

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