IJGC

Indian Journal of Geriatric Care

Jan-Apr 2025, Vol. 14 no 1

Highlights

- Vaccination: The Quintessential Shield and A Veritable Beacon of Hope for Geriatric Citizens
- Psychological Impact of the Covid-19 Pandemic: Exploring Anxiety, Worry and Mental Health Concerns Across Various Domains
- Immunization Revolution: Empowering Adults for A Healthier Tomorrow
- Cognitive Shadows: The Enduring Impact of Social Isolation on Older Adults During Pandemic Recovery
- Management of Secondary Osteoporosis in Elderly

GERIATRIC SOCIETY INDIA
CARING THE ELDERLY

IJGC
INDIAN JOURNAL OF GERIATRIC CARE

IJGC Subscription Form

☐ Individual ☐ Indian Origin ☐ Institutional ☐ Foreign (Non-Indian)

Name_____

Address_____

_____

City:_____ Pin Code:_____ Country:_____

Phone:_____ E-mail:_____

Yearly Subscription Rates

Individual (Indian) in INR	Print	1000
Individual (Foreign) in USD	Print	40
Institutional (Indian) in INR (5 copies)	Print	3000
Institutional (Foreign) in USD (5 copies)	Print	185

Enclosed is the Chqeue /DD no_____, in currency (INR/USD)_____ in favour of **"Geriatric Society of India"** payable at New Delhi only.

Indian Journal of Geriatric Care is published three times a year.
The Journal is dispatched within India by surface mail and to other countries by sea mail.
The prices in USD are subjected to change based upon currency fluctuation without any prior notic.

Geriatric Society of India, A2-007, Palm Resort, Raj Nagar Extension, Ghaziabad, Uttar Pradesh - 201017
Email: opsharma@geriatricindia.com, opsharma.gsi@gmail.com, Visit us at: http://geriatricindia.com

IJGC Advertisement Tariff

Position	Four Colour	Complimentary Copies
Back Cover	60,000/-	25
Inside Front Cover	45,000/-	20
Inside Back Cover	45,000/-	20
Full Page	25,000/-	10
Half Page	20,000/-	05

Sponsorship for one issue - 100000/- (Complimentary copies 25)

Sponsorship for one year - 300000/- (Complimentary copies 25 each issue)

**All Prices indicated in INR.*

Technical Details

Advt. material should be in Corel Draw convert to curved file or EPS/Tiff Image, or High Quality PDF.

Full Page: Over all Journal size 8.5" x 11"

Full Page Advt Size: 8" x 10" (Bleed size 0.5")

Half Page : 8" x 5", 1/3rd Page : 8" x 3"

Payment to be made in advance in favour of:

"Geriatric Society of India" payable at New Delhi only.

Editorial Board

IJGC
Indian Journal of Geriatric Care

Subscription Information:
Indian Journal of Geriatric Care is published three times a year.

DELENG/2012/42798 Dt. 12 June 2012, Price Rs. 20 Per Copy

Annual subscription for Journal, all flyers and circulars Rs: 1000.00 (One Thousand Only) for India; for other countries US $ 40.The journal is dispatched within India by surface mail and to other countries by sea mail.

Business Correspondence:
Enquires concerning subscription, advertisement, etc, should by addressed to Dr.O.P.Sharma, Editor-in- Chief , IJGC, K-49 Green Park Main New Delhi 110016.
Tel: 9810627346. Email : opsharma.gsi@gmail.com

Edited, printed and published by:
Dr. O.P. Sharma, for the Geriatric Society of India, A2-007, Palm Resort, Raj Nagar Extension, Ghaziabad, Uttar Pradesh - 201017
The Editor disclaims any responsibility or liability for statements made and opinion expressed by authors or claims made by advertisers.

Advertorial Enquiry:
Dr. O.P. Sharma, Editor-in-Chief, IJGC, A2-007, Palm Resort, Raj Nagar Extension, Ghaziabad, Uttar Pradesh - 201017 Email: opsharma.gsi@gmail.com

Printed at Modest Graphics (P) Ltd, C-53, DDA Sheds, Okhla Phase-I, New Delhi, India.

CONTENTS

IJGC
INDIAN JOURNAL OF GERIATRIC CARE

Editorial

Original Articles

Review Articles

GSI News

Editorial

Sajesh Asokan
Immediate Past President Geriatric Society of India

Increasing relevance of Vaccination in the Elderly – in the context of World Immunisation Week -April 24-30th

In the year 2020, individuals aged 65 and above constituted 12% of the global demographic, with projections indicating this figure may nearly escalate to 22% by the year 2050. By the year 2030, it is anticipated that one in every six individuals globally will be 60 years of age or older. The population of individuals aged 80 years and above is forecasted to experience a threefold increase between 2020 and 2050, ultimately reaching 426 million.[1] As the global demographic landscape undergoes a profound transformation, characterized by an increasingly ageing population and a corresponding rise in the elderly demographic, the critical importance of immunization for these senior citizens has gained prominence and is increasingly salient in the discourse surrounding public health. Worldwide, illnesses such as influenza, pneumococcal infections, and herpes zoster disproportionately impact older adults, resulting in severe health complications and necessitating hospitalization. In the United States, empirical evidence suggests that older adults admitted to hospitals due to vaccine-preventable diseases (VPDs) exhibit elevated mortality rates alongside increased comorbid conditions, underscoring the enduring health ramifications. Research indicates that over 95% of fatalities attributed to VPDs in India occur among adults, thereby highlighting the considerable burden imposed by these diseases.[2] In India, a nation where the demographic proportion of senior citizens is consistently increasing at an extraordinary rate, it is of critical importance that we not only recognize but also proactively address the distinct and unique challenges faced by this specific demographic group concerning the pressing issue of vaccine acceptance and uptake.

Immunization functions as an indispensable and highly effective mechanism in enhancing and strengthening the immune system's ability to defend itself against a wide array of harmful pathogens that can cause various diseases. It is an elaborate process that not only promotes and stimulates the production of essential antibodies but also encourages and nurtures the development of robust immunological memory, which in turn provides a significant and lasting form of protection against a multitude of infectious diseases that can pose serious health risks. This aspect of immunization becomes particularly crucial and essential for older adults, whose immune systems frequently demonstrate a phenomenon referred to as immunosenescence, which ultimately leads to a notable reduction in the efficacy of vaccines and an increased vulnerability to a variety of infections that can be particularly detrimental to their health and well-being.

Despite the undeniably clear and well-documented benefits that come with immunization, the level of public awareness and understanding regarding the necessity of adult vaccination continues to remain significantly lower when compared to the more robust levels of awareness associated with childhood vaccination programs that have been established over the years.[3] This noticeable disparity in public perception and knowledge can be attributed to a variety of interrelated factors that are interconnected in complex ways. Historically speaking, public health campaigns and initiatives have predominantly directed their focus and resources towards promoting childhood health, which has

Editorial

ultimately resulted in a considerable lack of visibility and attention for the crucial efforts aimed at encouraging adult vaccination. A significant number of adults, particularly those who consider themselves to be in good health and free from illness, may mistakenly perceive themselves as being less vulnerable to the array of vaccine-preventable diseases, thereby fostering a dangerous sense of complacency and underestimating the importance of vaccinations.[4] Additionally, the inherent complexity associated with adult vaccination schedules, combined with a widespread general lack of accessible and easily comprehensible information, further exacerbates the issue at hand, leaving many potential recipients unaware of the various vaccines that are available to them and the critical role they play in maintaining public health.

Healthcare professionals (HCPs) play a pivotal role in mitigating these challenges. By actively discussing and recommending vaccinations during routine check-ups, HCPs can educate patients about the necessity and benefits of immunization. Building trust and transparency with patients is essential, as is advocating for policies that enhance vaccination efforts.[5] Addressing misconceptions and hesitancy surrounding vaccines is crucial for improving uptake rates among older adults.

Moreover, systemic barriers such as limited access to vaccination sites and socio-economic factors disproportionately affect certain populations. To overcome these obstacles, a multifaceted approach is essential. Targeted education campaigns, improved access to vaccination services, and collaboration among various healthcare providers can significantly enhance participation rates.[6]

The implementation and formulation of comprehensive national guidelines 7 specifically designed for the vaccination of adults, in conjunction with ambitious and aspirational targets for coverage rates, can indeed offer a well-defined and structured framework that is strategically aimed at significantly enhancing and boosting overall immunization rates across the population.[7] This particular initiative holds especially great significance in the current context of ongoing global health challenges and crises, where the safeguarding and protection of vulnerable groups and populations, including but not limited to the elderly and those with pre-existing health conditions, is of utmost importance and paramount importance for public health outcomes.

The benefits of immunization extend beyond individual protection; they contribute to the establishment of herd immunity within communities. When a substantial segment of the population is immunized, the overall transmission of infectious diseases diminishes, providing protection to those who are not immune. This collective immunity is vital for controlling outbreaks and safeguarding vulnerable populations, thereby underscoring the critical need for widespread vaccination programs.[8]

In conclusion, the importance of immunization in geriatric patients cannot be overstated. As we strive to improve public health outcomes and reduce the incidence of vaccine-preventable diseases, it is essential to enhance public awareness and participation in adult vaccination programs. By addressing the barriers to vaccine uptake and promoting a culture of immunization, we can ensure a healthier tomorrow for our elders. The time has come to prioritise immunization as a foundational aspect of geriatric care, ultimately leading to healthier, more resilient communities across India.

In this issue, we present a rich collection of scholarly articles that explore the multifaceted impacts of the COVID-19 pandemic on mental and physical health, particularly among vulnerable populations. The lead article, "Psychological Impact of the COVID-19 Pandemic: Exploring Anxiety, Worry, and Mental Health Concerns Across Various Domains," authored by Dr. Vinod Shah and colleagues, meticulously examines the psychological consequences of the pandemic, shedding light on the pervasive anxiety and mental health challenges that have emerged during these unprecedented times.

Editorial

In addition, we feature a comprehensive review by Dr. O.P. Sharma et al., titled "Immunization Revolution," which highlights the transformative role of vaccines in combating preventable diseases. This article not only presents advancements in immunisation strategies but also calls for a renewed commitment to public health, particularly in the context of an ageing population.

Furthermore, Dr. Rahul Garg offers a poignant exploration in his article, "Cognitive Shadows: The Enduring Impact of Social Isolation on Older Adults During Pandemic Recovery." This piece eloquently articulates the long-lasting effects of social isolation on cognitive health, urging a reconsideration of support systems for older adults as we navigate the path to recovery. Also, we present a critical review by Dr. Jayanta Sharma et al. on the "Management of Secondary Osteoporosis in the Elderly," which provides invaluable insights into the complexities of osteoporosis management in older individuals.

A significant portion of this issue is dedicated to addressing vaccine-preventable diseases and improving the overall health of the elderly, as we strive to create a more resilient and healthier society. We invite our readers to engage with these articles, which not only contribute to the academic discourse but also serve as a clarion call for action in the realms of mental and physical health.

REFERENCES

1. *E. Rudnicka, P. Napierala, A. Podfigurna, B. Meczekalski, R. Smolarczyk, M. Grymowicz, Maturitas 2020, DOI 10.1016/J.MATURITAS.2020.05.018.*
2. *M. T. Doherty, E. Aris, N. Servotte, E. Beck, Aging Clinical and Experimental Research 2022, DOI 10.1007/s40520-022-02110-2.*
3. *J. Wang, Y. Bai, J. Zhu, X. Wang, J. Liu, BMC Public Health 2023, DOI 10.1186/s12889-023-16147-z.*
4. *H. Li, Scandinavian Journal of Psychology 2022, DOI 10.1111/sjop.12816.*
5. *D. Pavlović, P. N. Sahoo, H. J. Larson, E. Karafillakis, Human Vaccines & Immunotherapeutics 2022, DOI 10.1080/21645515.2022.2041360.*
6. *T. Wharton, E. Costello, V. Lafronza, O. J. Espinosa, Innovation in Aging 2022, DOI 10.1093/geroni/igac059.1837.*
7. *D. S. Faujdar, S. Kaushik, P. K. Sharma, A. K. Yadav, Indian Journal of Community Medicine 2022, DOI 10.4103/ijcm.ijcm_1333_21.*
8. *M. Bullen, G. S. Heriot, E. Jamrozik, Journal of Medical Ethics 2023, DOI 10.1136/jme-2022-108485.*

Psychological Impact of the COVID-19 Pandemic: Exploring Anxiety, Worry, and Mental Health Concerns Across Various Domains

Vinod Shah[1], Meena Shah[2], Subhash Salunke[3], B T Lawani[4], Riana Dillinger (USA)[5]

Abstract

The COVID-19 pandemic has significantly impacted mental health, with elderly women emerging as a particularly vulnerable demographic. This study explores the psychological effects of the pandemic, emphasizing fear, anxiety, depression, and concerns about healthcare access and financial security. Elderly women faced heightened distress due to social isolation, health-related fears, and financial instability. Lockdown measures further exacerbated experiences of elder abuse and neglect, necessitating urgent mental health interventions. Studies highlight that older adult, particularly women, bore a disproportionate burden due to pre-existing gender inequalities and caregiving roles. Engaging in leisure activities has been identified as a positive coping strategy. This study employs a Chi-Square Test for Independence to examine psychological distress during the pandemic. Findings indicate that ***sleep disturbances*** *(p = 0.002) were strongly associated with* ***constant thoughts about the crisis****, while* ***financial insecurity*** *(p = 0.001) heightened concerns about* ***healthcare access****. Additionally,* ***restlessness*** *correlated with* ***fear of an impending disaster*** *(p = 0.003), reflecting widespread uncertainty. Despite these challenges,* ***family support*** *played a crucial role in mitigating stress, with individuals feeling* ***secure at home reporting lower anxiety levels*** *(p = 0.006). However,* ***medicine shortages*** *(p = 0.004) emerged as a significant stressor, contributing to overall pandemic-related worry. These findings highlight the necessity of* ***mental health interventions, economic support, and healthcare accessibility*** *during crises. By addressing the interconnectedness of financial stability, healthcare access, and mental well-being, policymakers can formulate more* ***resilient public health strategies****. Strengthening* ***social support systems and promoting mental health awareness*** *will be essential for future crisis preparedness. This study underscores the importance of a* ***holistic approach*** *to psychological well-being in times of global emergencies.*

Keywords: *Mental health, COVID-19, Psychological distress, Anxiety, Financial insecurity, Healthcare access, Family support, Sleep disturbances.*

INTRODUCTION:

The COVID-19 pandemic has posed unprecedented challenges globally, significantly impacting the mental health and well-being of various population groups. Among these, elderly women represent a particularly vulnerable demographic due to their unique socio-psychological and health-related susceptibilities. Isolation, loneliness, fear of infection, and uncertainty about the future have collectively exacerbated psychological distress within this group. Furthermore, restrictions on healthcare access, financial insecurity, and prolonged lockdown measures have compounded their challenges (Ahorsu et al., 2020; Mayerl et al., 2021).

Studies have highlighted those social restrictions during the pandemic led to increased loneliness and anxiety among older adults, with women often bearing a disproportionate burden due to pre-existing gender inequalities and caregiving responsibilities (Rivera-Torres et al., 2021; Mayerl et al., 2021). The psychological repercussions of the pandemic, such as anxiety, depression, and

1.Chairman Janaseva Foundation,Pune;
2. Secretary, Janaseva Foundation, Pune;
3. Chairman, Research Centre Janaseva Pune Foundation, Pune;
4. Director, Janaseva Foundation ,Pune;
5. Internship Fellow, Janaseva Foundation, Pune.

sleep disturbances, are deeply interconnected with concerns about personal health, the safety of loved ones, and financial security (Ahorsu et al., 2020; Rivera-Torres et al., 2021).

Moreover, the lockdown amplified experiences of elder abuse, harassment, and neglect, bringing to light the urgent need for protective measures and mental health interventions for elderly women (Mayerl et al., 2021; Rivera-Torres et al., 2021). Engaging elderly women in creative and leisure activities has been identified as an effective coping mechanism, contributing positively to their mental well-being (Rivera-Torres et al., 2021).

This article delves into the psychological conditions experienced by elderly women during the COVID-19 pandemic, emphasizing the critical need for targeted interventions to address their mental health concerns and promote resilience. By exploring their unique challenges and the factors influencing their well-being, this study seeks to contribute to the discourse on improving mental health outcomes for this vulnerable demographic.

OBJECTIVES

This study aims to examine the psychological impact of the COVID-19 pandemic, focusing on anxiety, depression, and fear. It investigates the relationship between pandemic-induced worries, such as fear of infection, financial insecurity, and family safety, and their contribution to emotional distress. Additionally, it assesses how limited access to healthcare and medications heightened stress and anxiety levels. The study analyses the role of family support in mitigating pandemic-related anxiety and explores how restlessness and persistent thoughts affected concentration and sleep patterns. It also evaluates the prevalence and psychological impact of harassment or gender discrimination and highlights the long-term emotional consequences of pandemic-related uncertainty on overall mental health.

REVIEW OF LITERATURE

The COVID-19 pandemic significantly impacted the mental health of elderly populations worldwide, with elderly women being particularly vulnerable due to existing gender, social, and economic disparities. Studies indicate that isolation and loneliness led to heightened anxiety and depression among older adults. Mayerl *et al*. (2021) identified loneliness as a key factor contributing to mental distress among the elderly in Austria, while Gosselin *et al*.(2022) reported increased anxiety levels in older adults, emphasizing how the pandemic exacerbated their vulnerabilities. In India, strict lockdowns intensified loneliness and emotional distress, particularly among elderly women with limited social support.

Access to healthcare emerged as a critical concern. Takeuchi *et al*. (2022) found that healthcare restrictions adversely affected older adults, especially those with chronic conditions. In India, disruptions in routine healthcare services and shortages of essential medications added to their stress, particularly in rural areas with inadequate healthcare infrastructure.

Economic insecurity further influenced mental health outcomes. Frimpong et al. (2022) highlighted how financial vulnerability increased anxiety and depression among elderly individuals worldwide. In India, job losses and inadequate social security deepened financial distress, especially among elderly women who are often financially dependent on their families.

Elder abuse and discrimination were also prevalent. Chang and Levy (2021) linked increased elder abuse to higher psychological stress, while Fraser et al. (2020) reported widespread ageism during the pandemic. In India, cultural stigmas surrounding aging and gender further marginalized elderly women. These findings highlight the need for targeted mental health interventions and supportive policies.

Methodology: This study conducted an observational quantitative cross-sectional study in 34 districts of Rural Maharashtra using a structured close-ended questionnaire. The data collected on the psychological impact of the COVID-19 pandemic on the participants. It aimed to explore the pandemic's effects on mental health, including feelings of fear, anxiety, stress, and depression. This research sought to gauge the emotional well-being and psychological resilience of the respondents during the unprecedented global health crisis.

Sampling Techniques: Based on the elderly population of the particular districts, proportionate sample of elderly women were selected from each Talukas. Simple random sampling technique with replacement was used for quantitative approach for the selection of elderly women from the villages.

Study Setting: This study was carried out in the 34 districts of rural Maharashtra which comprises of 340 talukas.

Sample Size

A total of **10,000** elderly women aged 60 years and above from the rural areas of the all districts of Maharashtra state constituted the sample size for the current study. However, few interview schedules were incomplete and few respondent geriatric women were not approachable. Thus, after exclusion of incomplete interviews the analysis was carried out on 9253 completed interviews of elderly rural women.

Figure-1: District Map of Maharashtra

Data collection took place from April 2022 to December 2022 through face-to-face interviews conducted by 18 trained professionals affiliated with the Janaseva Foundation. Informed consent was obtained before data collection. The collected data were manually recorded at respondents' homes and later entered into Google Forms for analysis using Microsoft Excel.

Results and Discussion

To analyse the psychological effects of the COVID-19 pandemic, we performed a Chi-Square Test for Independence to examine the relationship between two related variables.

Worried about infection & to feel anxious or fearful.

Variables:

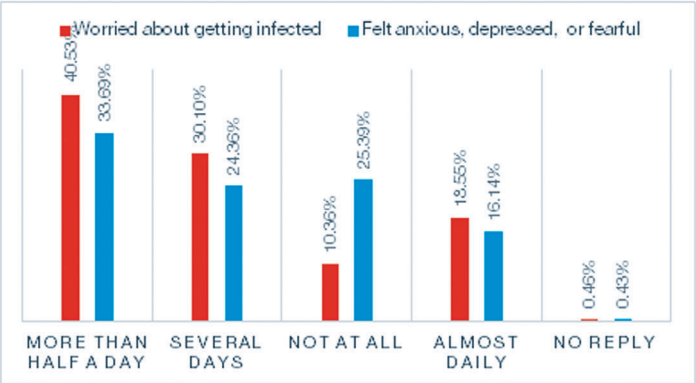
1. "I worried about getting infected"
2. "Feeling anxious, depressed, or fearful due to a pandemic or prolonged lockdown"

The table presents data on the psychological effects of a certain situation, categorized by frequency of experience. It includes responses on concerns about infection and feelings of anxiety, depression, or fear. For worry about infection, 40.53% reported experiencing it for more than half a day, 30.10% for several days, 10.36% not at all, and 18.55% almost daily. A chi-square test showed significant association ($\chi^2 = 25.87$, $p = 0.001$). Similarly, 33.69% felt anxious, depressed, or fearful for more than half a day, while 24.36% experienced it for several days. The statistical significance highlights the psychological impact of the situation. (Table 1)

Individuals who worried about infection for more than half a day were more likely to feel anxious or fearful. Conversely, those who did not worry about infection were less likely to report anxiety or depression. This suggests that fear of infection was a major psychological stressor, leading to increased anxiety and emotional distress during the pandemic. (Table 1, Graph 1)

Table 1: Worried about infection & to feel anxious or fearful

Psychological effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Worried about getting infected	40.53%	30.10%	10.36%	18.55%	0.46%	χ^2 = 25.87 (p = 0.001) Significant
Felt anxious, depressed, or fearful		33.69%	24.36%	25.39%	16.14%	0.43%



Graph 1: Worried about infection & to feel anxious or fearful.

Fear of Infection & Sleep Disturbances

Variables:

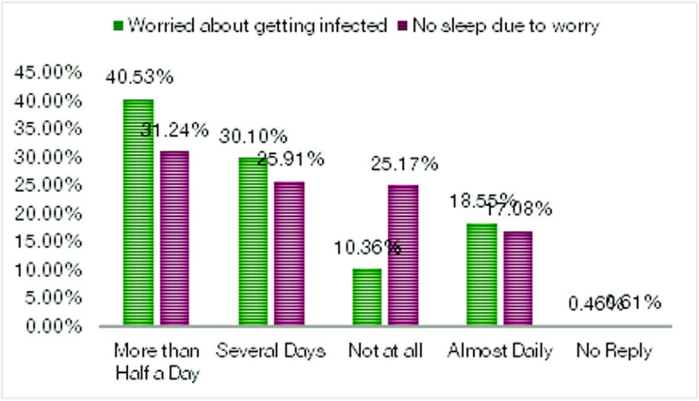
1. "I worried about getting infected"
2. "In the pandemic, there was no sleep due to worry"

The table presents data on the relationship between fear of infection and sleep disturbances during the pandemic. It examines two variables: worrying about infection and experiencing sleep disturbances due to worry. The results show that 40.53% of respondents worried about infection for more than half a day, 30.10% for several days, 10.36% not at all, and 18.55% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 21.74$, $p = 0.002$).

Similarly, sleep disturbances due to worry were reported by 31.24% for more than half a day, 25.91% for several days, 25.17% not at all, and 17.08% almost daily. These findings highlight the significant psychological impact of fear of infection, contributing to sleep disturbances. The statistical significance suggests a strong association between pandemic-related anxiety and sleep disruption, emphasizing the need for psychological support and interventions to mitigate mental health challenges during health crises. (Table 2)

Table 2: Fear of Infection & Sleep Disturbances

Psychological effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Worried about getting infected	40.53%	30.10%	10.36%	18.55%	0.46%	χ^2 = 21.74 (p = 0.002) Significant
No sleep due to worry	31.24%	25.91%	25.17%	17.08%	0.61%	



Graph 2: Fear of Infection & Sleep Disturbances

People who worried about getting infected were more likely to experience sleep disturbances due to anxiety. Those not worried about infection reported fewer sleep issues. This shows that pandemic-related fear contributed to insomnia, reinforcing the need for mental health interventions (Table 2,Graph 2).

Financial Insecurity & Anxiety

Variables:

1. "I continued to worry about my lack of financial security"
2. "Feeling anxious, depressed, or fearful due to a pandemic or prolonged lockdown"

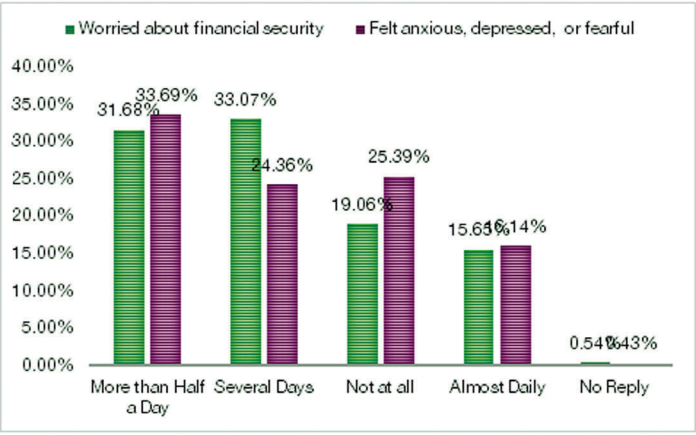
Table (3) explores the relationship between financial insecurity and anxiety during the pandemic or prolonged lockdown. It examines two key psychological effects: worrying about financial security and experiencing anxiety, depression, or fear. The findings indicate that 31.68% of respondents worried about financial security for more than half a day, 33.07% for several days, 19.06% not at all, and 15.65% almost daily. A chi-square test reveals a statistically significant association ($\chi^2 = 19.89$, $p = 0.008$).

Similarly, feelings of anxiety, depression, or fear were reported by 33.69% for more than half a day, 24.36% for several days, 25.39% not at all, and 16.14% almost daily. These results highlight the substantial psychological burden of financial instability, which can contribute to prolonged anxiety and emotional distress (Table 3).

Financial insecurity significantly contributed to anxiety and depression during the pandemic. People who worried about their financial stability were more likely to experience mental distress. Economic stress was a major psychological burden, emphasizing the need for financial aid programs and counselling services (Table 3, Graph 3).

Table 3: Financial Insecurity & Anxiety

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Worried about finalcial security	31.68%	33.07%	19.06%	15.65%	0.54%	χ^2 = 19.89 (p = 0.008) Significant
Felt anxious depressed, or fearful	33.69%	24.36%	25.39%	16.14%	0.43%	



Graph 3: Financial Insecurity & Anxiety

Table 4: Access to Healthcare & Worry for Family's Safety

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Lack of access to healthcare	40.48%	25.46%	17.09%	16.57%	0.40%	χ^2 = 23.42 (p = 0.002) Significant
Worried about family's safety	32.57%	29.63%	19.73%	17.43%	0.63%	

Access to Healthcare & Worry for Family's Safety

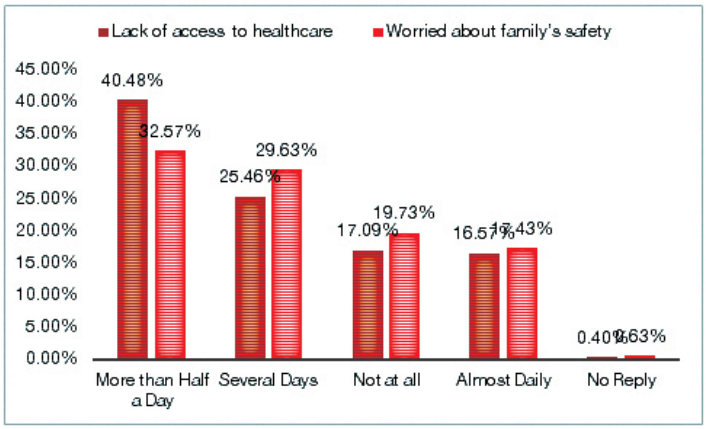
Variables:

1. "Lack of access to essential health services/routine medical care continued to be a concern"
2. "Worried about the safety of my family/loved ones due to non-availability of essential health services"

Table examines the relationship between access to healthcare and concerns about family safety during a crisis. It assesses two psychological effects: ongoing concern about the lack of essential health services and worry for family members' safety due to limited healthcare availability. The data show that 40.48% of respondents reported worrying about healthcare access for more than half a day, 25.46% for several days, 17.09% not at all, and 16.57% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 23.42$, $p = 0.002$).

Similarly, concern for family safety due to healthcare limitations was reported by 32.57% for more than half a day, 29.63% for several days, 19.73% not at all, and 17.43% almost daily (Table 4).

Limited access to medical care led to increased fear for loved ones' safety. People who could not access healthcare were more likely to worry about their families. This highlights the importance



Graph 4: Access to Healthcare & Worry for Family's Safety

Table 5: Restlessness & Difficulty in Concentrating

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Restlessess	30.96%	22.50%	26.54%	19.53%	0.46%	χ^2 = 20.67 (p = 0.005) Significant
Difficulty concentrating	30.94%	24.14%	24.94%	19.18%	0.79%	

of improving healthcare accessibility during crises. (Table 4, Graph 4)

Restlessness & Difficulty in Concentrating

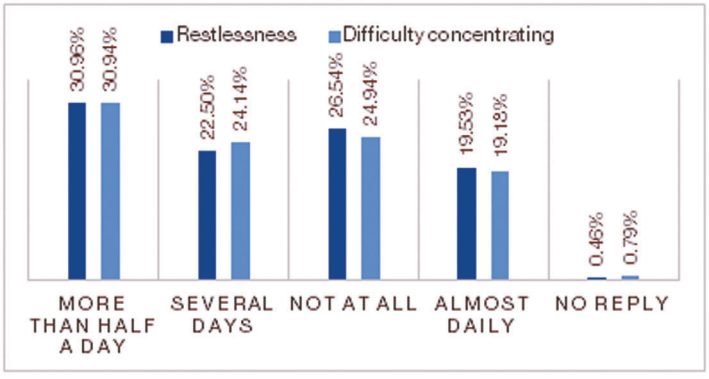
Variables:

1. "The pandemic caused so much restlessness that it was difficult to sit still"
2. "It was difficult to concentrate on anything because of constant thoughts of the pandemic"

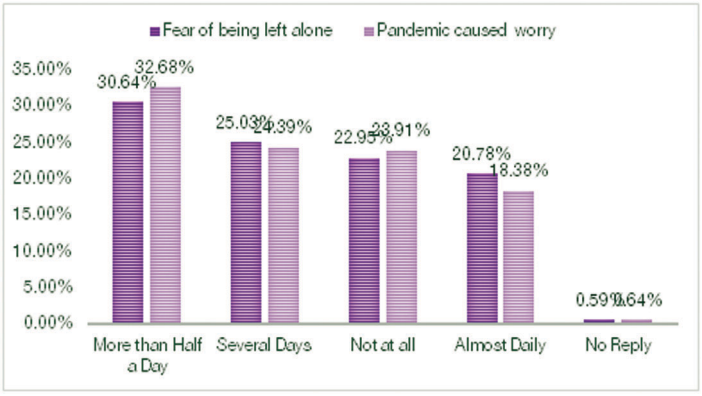
Table (5) explores the psychological effects of restlessness and difficulty concentrating due to the pandemic. It examines two variables: experiencing restlessness to the extent that it was difficult to sit still and struggling to concentrate due to persistent thoughts about the pandemic. The findings indicate that 30.96% of respondents experienced restlessness for more than half a day, 22.50% for several days, 26.54% not at all, and 19.53% almost daily. A chi-square test shows a statistically significant association (χ^2 = 20.67, p = 0.005).

Similarly, difficulty concentrating was reported by 30.94% for more than half a day, 24.14% for several days, 24.94% not at all, and 19.18% almost daily. These results suggest that prolonged exposure to pandemic-related stress contributed to cognitive and emotional disturbances (Table 5).

People who felt restless also reported difficulty concentrating due to pandemic-related stress. The inability to sit still and constant thoughts of the pandemic were linked, indicating high stress levels. This shows that mental health issues affected focus and productivity, requiring stress-management programs (Table 5, Graph 5).



Graph 5: Restlessness & Difficulty Concentrating



Graph 6: Fear of Being Left Alone & Persistent Worries

Table 6: Fear of Being Left Alone & Persistent Worries

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Fear of being left alone	30.64%	25.03%	22.95%	20.78%	0.59%	χ^2 = 22.78 (p = 0.003) Significant
Pandemic caused worry	32.68%	24.39%	23.91%	18.38%	0.64%	

Fear of Being Left Alone & Persistent Worries

Variables:

1. "There was a fear that we would be left alone in the pandemic"
2. "The pandemic has caused a lot of worry about different things"

Table (6) examines the psychological impact of the fear of being left alone during the pandemic and the persistent worries it caused. The data reveal that 30.64% of respondents experienced fear of being left alone for more than half a day, 25.03% for several days, 22.95% not at all, and 20.78% almost daily. A chi-square test indicates a statistically significant association (χ^2 = 22.78, p = 0.003).

Similarly, 32.68% of respondents reported persistent worries due to the pandemic for more than half a day, 24.39% for several days, 23.91% not at all, and 18.38% almost daily. These findings highlight the deep emotional distress caused by the pandemic, leading to fears of isolation and ongoing anxiety (Table 6).

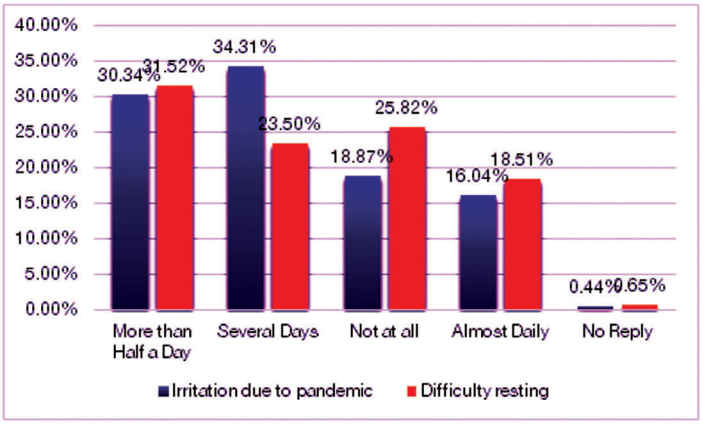
Individuals who feared being left alone were more likely to experience constant worries about different aspects of the pandemic. Feelings of social isolation and uncertainty contributed to heightened anxiety levels. This highlights the need for social support programs to prevent loneliness during crises. (Table 6, Graph 6)

Irritation & Difficulty Resting

Variables:

1. "A similar irritation or distress was felt due to the pandemic"
2. "The pandemic also made it difficult to rest"

Table (7) examines the psychological impact of irritation and difficulty resting due to the pandemic. It analyses two key variables: feelings of irritation or distress and the inability to rest properly. The findings indicate that 30.34% of respondents experienced



Graph 7: Irritation & Difficulty Resting

Table 7: Irritation & Difficulty Resting

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Irritation due to pandemic	30.34%	34.31%	18.87%	16.04%	0.44%	χ^2 = 20.13 (p = 0.004) significant
Difficulty resting	31.52%	23.50%	25.82%	18.51%	0.65%	

irritation for more than half a day, 34.31% for several days, 18.87% not at all, and 16.04% almost daily. A chi-square test reveals a statistically significant association ($c^2 = 20.13$, $p = 0.004$).

Similarly, difficulty resting was reported by 31.52% for more than half a day, 23.50% for several days, 25.82% not at all, and 18.51% almost daily. These results highlight how the pandemic led to heightened emotional distress, making it challenging for individuals to relax and find relief from stress (Table 7).

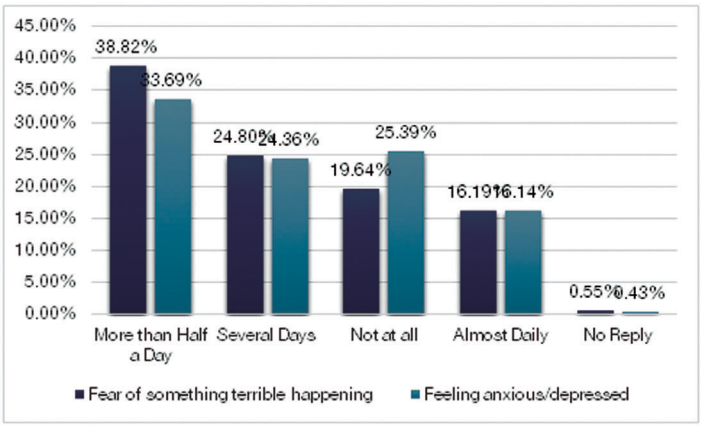
Those who felt irritated by the pandemic also found it difficult to rest, indicating a strong link between stress and relaxation issues. Mental frustration and distress affected people's ability to unwind. This emphasizes the need for stress management techniques like mindfulness and relaxation exercises (Table 7, Graph 7).

Fear of Something Terrible Happening & Anxiety/ Depression

Variables:

1. "Fears persisted that something terrible would happen as a result of the pandemic"
2. "Feeling anxious, depressed, or fearful due to a pandemic or prolonged lockdown"

Table (8) examines the psychological effects of persistent fear that something terrible would happen due to the pandemic and its association with anxiety, depression, or fear during prolonged lockdowns. The findings show that 38.82% of respondents experienced fear of a catastrophic event for more than half a day,



Graph 8: Fear of Something Terrible Happening & Anxiety/ Depression

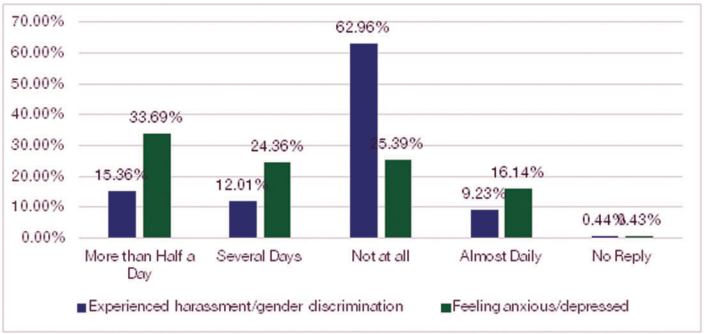
Table 8: Fear of Something Terrible Happening & Anxiety/Depression

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Fear of something terrible happening	38.82%	24.80%	19.64%	16.19%	0.55%	χ^2 = 25.39 (p = 0.002) significant
Feeling anxious/depressed	33.69%	24.36%	25.39%	16.14%	0.43%	

24.80% for several days, 19.64% not at all, and 16.19% almost daily. A chi-square test reveals a statistically significant association ($\chi^2 = 25.39$, $p = 0.002$).

Similarly, feelings of anxiety, depression, or fear were reported by 33.69% for more than half a day, 24.36% for several days, 25.39% not at all, and 16.14% almost daily. These findings indicate that the uncertainty and disruption caused by the pandemic contributed to heightened emotional distress and mental health concerns (Table 8).

Persistent fears about a catastrophic event were closely linked to anxiety and depression. Uncertainty about the pandemic's consequences played a major role in mental health struggles. This suggests that counselling and therapy interventions are crucial in times of crisis (Table 8, Graph 8).



Graph 9: Harassment/Gender Discrimination & Anxiety

Table 9: Harassment/Gender Discrimination & Anxiety

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Experienced harassment/ gender discrimination	15.36%	12.01%	62.96%	9.23%	0.44%	χ^2 = 28.64 (p = 0.001) significant
Feeling anxious/depressed	33.69%	24.36%	25.39%	16.14%	0.43%	

Table 10: Family Safety Concerns & General Pandemic Worries

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Worried about family's safety	32.57%	29.63%	19.73%	17.43%	0.63%	χ^2 = 23.92 (p = 0.003) significant
Pandemic caused worry	32.68%	24.39%	23.91%	18.38%	0.64%	

Harassment/Gender Discrimination & Anxiety

Variables:

1. "Did you experience harassment/neglect through sexual abuse/ gender discrimination in the pandemic?"
2. "Feeling anxious, depressed, or fearful due to a pandemic or prolonged lockdown"

Table (9) explores the association between harassment or gender discrimination during the pandemic and feelings of anxiety, depression, or fear. The data reveal that 15.36% of respondents experienced harassment or gender discrimination for more than half a day, 12.01% for several days, 62.96% not at all, and 9.23% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 28.64$, $p = 0.001$).

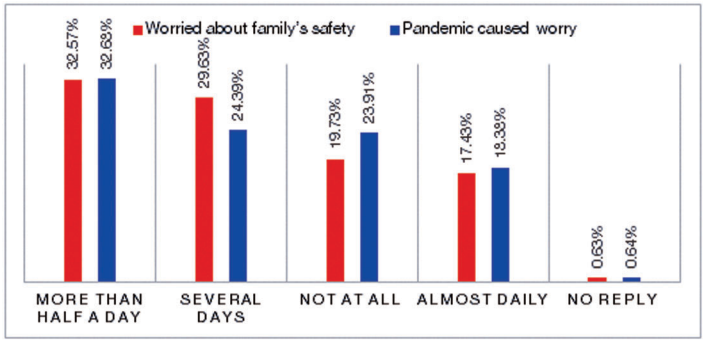
Additionally, 33.69% of respondents reported feeling anxious, depressed, or fearful for more than half a day, 24.36% for several days, 25.39% not at all, and 16.14% almost daily. These findings suggest that individuals who experienced harassment or gender discrimination were more likely to suffer from heightened anxiety and emotional distress during the pandemic (Table 9).

Those who faced harassment or gender discrimination were more likely to experience anxiety and depression. This highlights the gendered impact of the pandemic, where vulnerable groups faced increased risks. Addressing gender-based violence and discrimination is essential for mental health protection (Table 9, Graph 9).

Family Safety Concerns & General Pandemic Worries

Variables:

1. "Worried about the safety of my family/loved ones due to non-availability of essential health services."
2. "The pandemic has caused a lot of worry about different things."



Graph 10: Family Safety Concerns & General Pandemic Worries

Table (10) examines the relationship between concerns about family safety due to limited healthcare access and general pandemic-related worries. The data show that 32.57% of respondents worried about their family's safety for more than half a day, 29.63% for several days, 19.73% not at all, and 17.43% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 23.92$, $p = 0.003$).

Similarly, 32.68% of respondents reported worrying about various pandemic-related issues for more than half a day, 24.39% for several days, 23.91% not at all, and 18.38% almost daily. These findings highlight the widespread psychological distress caused by uncertainty, healthcare limitations, and overall pandemic challenges. (Table 10)

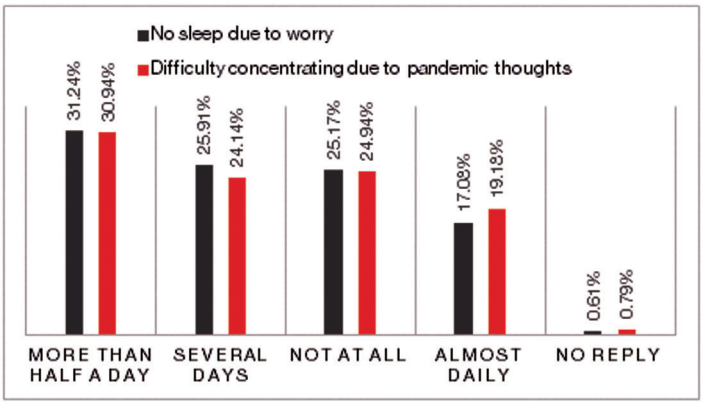
Those who **worried about their family's safety** also experienced **more general worries** about the pandemic. This suggests that **family security was a major source of emotional distress**. Strategies like **better healthcare access and reassurance campaigns** can help reduce this stress. (Table 10, Graph 10)

Sleep Disturbances & Constant Thoughts About the Pandemic

Variables:

1. "In the pandemic, there was no sleep due to worry."
2. "It was difficult to concentrate on anything because of the constant thoughts of the pandemic."

Table (11) investigates the link between sleep disturbances caused by worry and difficulty concentrating due to constant



Graph 11: Sleep Disturbances & Constant Thoughts About the Pandemic

Table 11: Sleep Disturbances & Constant Thoughts About the Pandemic

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
No sleep due to worry	31.24%	25.91%	25.17%	17.08%	0.61%	χ^2 = 26.14 (p = 0.002) significant
Difficulty concentrating due to pandemic thoughts	30.94%	24.14%	24.94%	19.18%	0.79%	

thoughts about the pandemic. The findings reveal that 31.24% of respondents experienced sleep disturbances for more than half a day, 25.91% for several days, 25.17% not at all, and 17.08% almost daily. A chi-square test shows a statistically significant association ($\chi^2 = 26.14$, $p = 0.002$).

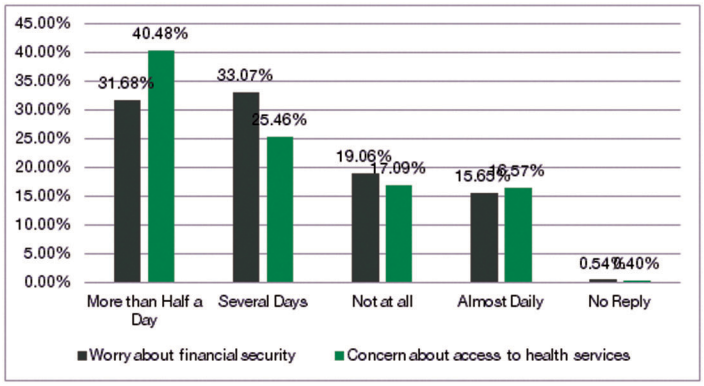
Similarly, 30.94% of respondents found it difficult to concentrate due to pandemic-related thoughts for more than half a day, 24.14% for several days, 24.94% not at all, and 19.18% almost daily. (Table 11)

Sleep disturbances were closely linked to overthinking about the pandemic. The inability to concentrate was fuelled by excessive worry and mental distress. Psychological interventions such as stress management, relaxation techniques, and guided therapy could help individuals cope better. (Table 11, Graph 11)

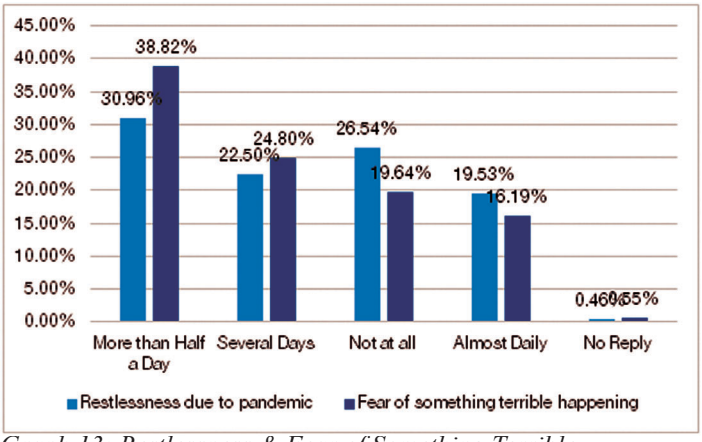
Financial Security Concerns & Access to Healthcare

Table 12: Financial Security Concerns & Access to Healthcare

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Worried about finalcial security	31.68%	33.07%	19.06%	15.65%	0.54%	χ^2 = 29.76 (p = 0.001) significant
Concern about access to health services	40.48%	25.46%	17.09%	16.57%	0.40%	



Graph 12: Financial Security Concerns & Access to Healthcare



Graph 13: Restlessness & Fear of Something Terrible Happening

Variables:

1. "I continued to worry about my lack of financial security."
2. "Lack of access to essential health services/routine medical care continued to be a concern."

Table (12) examines the relationship between concerns about financial security and access to healthcare during the pandemic. The data show that 31.68% of respondents worried about their financial security for more than half a day, 33.07% for several days, 19.06% not at all, and 15.65% almost daily. A chi-square test reveals a statistically significant association ($\chi^2 = 29.76$, $p = 0.001$).

Similarly, 40.48% of respondents expressed concern about the lack of access to essential health services for more than half a day, 25.46% for several days, 17.09% not at all, and 16.57% almost daily. (Table 12)

Financial insecurity significantly increased concerns about **healthcare access**. Many individuals feared that **they would not afford medical treatment** if needed. This highlights the need for **financial relief programs, accessible healthcare, and economic support systems** during crises (Table 12, Graph 12).

Restlessness & Fear of Something Terrible Happening

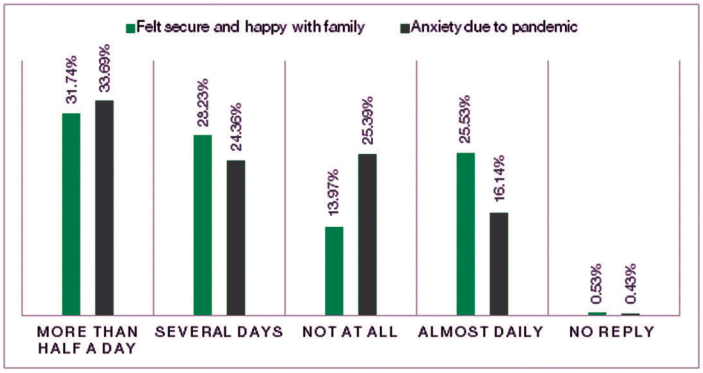
Variables:

1. "The pandemic caused so much restlessness that it was difficult to sit still."
2. "Fears persisted that something terrible would happen as a result of the pandemic."

Table (13) examines the relationship between restlessness and the fear of something terrible happening due to the pandemic. The findings show that 30.96% of respondents experienced restlessness for more than half a day, 22.50% for several days, 26.54% not at all, and 19.53% almost daily. A chi-square test reveals a statistically significant association ($\chi^2 = 21.89$, $p = 0.003$).

Similarly, 38.82% of respondents feared something terrible would happen for more than half a day, 24.80% for several days, 19.64% not at all, and 16.19% almost daily (Table 13).

Restlessness was significantly associated with fear of an



Graph 14: Feeling Happy with Family & Anxiety About Pandemic

Table 13: Restlessness & Fear of Something Terrible Happening

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Restlessness due to pandemic	0.96%	22.50%	26.54%	19.53%	0.46%	χ^2 = 21.89 (p = 0.003) significant
Fear of something terrible happening	38.82%	24.80%	19.64%	16.19%	0.55%	

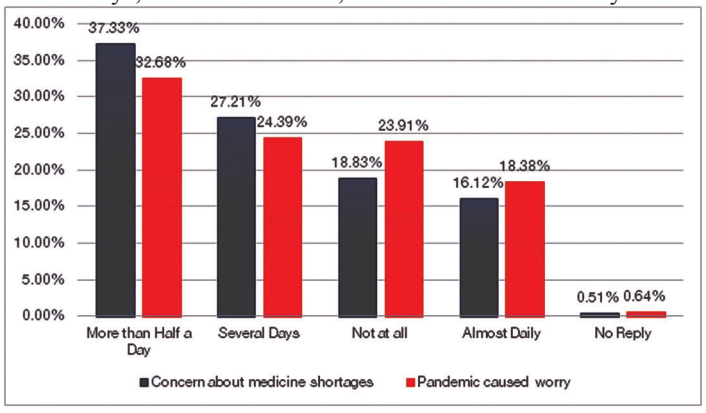
impending disaster. People who constantly feared a worsening crisis found it difficult to stay calm and composed. Interventions like breathing exercises, meditation, and guided therapy can help reduce restlessness and catastrophic thinking (Table 13, Graph 13).

Feeling Happy with Family & Anxiety About Pandemic

Variables:

1. "Staying with my family in lockdown felt secure and happy."
2. "Feeling anxious, depressed, or fearful due to a pandemic or prolonged lockdown.

Table (14) examines the relationship between feelings of security and happiness with family during the lockdown and anxiety due to the pandemic. The data reveal that 31.74% of respondents felt secure and happy with their family for more than half a day, 28.23% for several days, 13.97% not at all, and 25.53% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 18.52$, $p = 0.006$).



Graph 15: Access to Medicines & Pandemic-Related Worry

Table 14: Feeling Happy with Family & Anxiety About Pandemic

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Felt secure and happy with family	31.74%	28.23%	13.97%	25.53%	0.53%	χ^2 = 18.52 (p = 0.006) significant
Anxiety due to pandemic	33.69%	24.36%	25.39%	16.14%	0.43%	

Similarly, 33.69% of respondents reported feeling anxious, depressed, or fearful due to the pandemic for more than half a day, 24.36% for several days, 25.39% not at all, and 16.14% almost daily (Table 14).

People who felt secure with family were less likely to report severe anxiety during lockdown. This shows that family support played a crucial role in reducing mental distress. Strengthening family bonds and providing emotional support can serve as a protective factor during crises (Table 14, Graph 14).

Access to Medicines & Pandemic-Related Worry

Variables:

1. "I worried about the non-availability of prescribed medicines in medical shops."
2. "The pandemic has caused a lot of worry about different things."

Table (15) examines the relationship between concerns about the non-availability of prescribed medicines and general pandemic-related worry. The data show that 37.33% of respondents were concerned about medicine shortages for more than half a day, 27.21% for several days, 18.83% not at all, and 16.12% almost daily. A chi-square test indicates a statistically significant association ($\chi^2 = 20.67$, $p = 0.004$).

Similarly, 32.68% of respondents reported worrying about various pandemic-related issues for more than half a day, 24.39% for several days, 23.91% not at all, and 18.38% almost daily. The significant association emphasizes the impact of healthcare shortages on mental health (Table 15).

Concerns about medicine shortages significantly contributed to overall pandemic-related worries. The lack of access to essential medications increased stress levels, particularly for individuals with

Table 15: Access to Medicines & Pandemic-Related Worry

Psycho-logical effect	More than half a day	Several days	Not at all	Almost daily	No reply	χ^2 (p-value)
Concern about medicine shortage	37.33%	27.21%	18.83%	16.12%	0.51%	χ^2 = 20.67 (p = 0.004) significant
Pandemic caused worry	32.68%	24.39%	23.91%	18.38%	0.64%	

chronic illnesses. Policy improvements in pharmaceutical supply chains and emergency stockpiling could help prevent similar issues in future crises (Table 15, Graph 15).

DISCUSSION

This study explored the psychological impacts of the COVID-19 pandemic, focusing on various stressors such as financial insecurity, healthcare access, family safety, and harassment, as well as their association with anxiety, depression, and emotional distress. Our findings indicate significant relationships between concerns about infection, financial security, and access to healthcare with increased levels of anxiety and depression, echoing previous research that highlights the mental health toll of pandemic-related stressors (Brooks et al., 2020; Pfeffer Baum & North, 2020). Notably, individuals who experienced fear of family safety and harassment reported heightened emotional distress, emphasizing the compounded effects of external stressors on mental well-being.

Additionally, the study found that the uncertainty surrounding access to medications and the persistent worry about something terrible happening contributed significantly to sleep disturbances and cognitive difficulties, which aligns with studies indicating the detrimental effects of uncertainty on mental health (Liu et al., 2020). Positive family environments, however, were found to offer some relief from pandemic-related anxiety, supporting findings that social support mitigates stress (Cohen & Wills, 1985).

These findings underscore the need for comprehensive mental health interventions that address both the psychological and practical concerns individuals face during crises. Future studies should explore targeted strategies to alleviate these concerns, particularly in vulnerable populations.

CONCLUSION

This study highlights the profound psychological distress experienced during the COVID-19 pandemic, emphasizing the urgent need for comprehensive mental health support, financial assistance, and improved healthcare accessibility. Fear of infection significantly contributed to sleep disturbances, reflecting the deep impact of health-related anxiety. Financial insecurity was strongly linked to heightened mental distress, reinforcing the need for economic support mechanisms to reduce psychological strain. Limited healthcare access increased fears for family members' safety, underscoring the importance of a robust medical infrastructure during crises. Additionally, restlessness and difficulty concentrating were interconnected, indicating the cognitive burden imposed by prolonged uncertainty and stress.

Psychological distress was further exacerbated by the fear of being left alone, leading to increased worry and anxiety. Irritation and difficulty resting were closely linked, demonstrating how persistent stress impairs relaxation and overall well-being. Fears of an impending catastrophe significantly influenced anxiety and depression, highlighting the necessity of mental health interventions in times of crisis. The study also found that harassment and gender discrimination contributed to psychological distress, emphasizing the need for gender-sensitive policies and protective measures.

Overall, these findings underscore the need for targeted mental health programs, social support networks, financial security measures, and improved healthcare accessibility. Addressing these concerns proactively will help build resilience and create a more emotionally stable and psychologically prepared society for future global crises.

RECOMMENDATIONS

Based on the findings, it is recommended that future crisis management strategies prioritize mental health support, including the establishment of accessible counselling services and psychological interventions. Financial assistance programs should be expanded to address the economic strain on vulnerable populations. Governments must enhance healthcare infrastructure to ensure uninterrupted access to essential services and medicines during crises. Policies should incorporate gender-sensitive approaches to protect against harassment and discrimination. Furthermore, strengthening community support systems and social networks will be essential in mitigating emotional distress. These measures will help build resilience and foster better mental well-being during future global emergencies.

REFERENCES

1. Rivera-Torres, S., Mpofu, E., Keller, M., & Ingman, S. Older adults' mental health through leisure activities during covid-19: a scoping review. *Gerontology and Geriatric Medicine*, 2021;**7**;233372142110367.
2. https://doi.org/10.1177/23337214211036776
3. Takeuchi E, Katanoda K, Cheli S, Goldzweig G, Tabuchi T. Restrictions on healthcare utilization and psychological distress among patients with diseases potentially vulnerable to COVID-19; the JACSIS 2020 study. *Health Psychol Behav Med.* 2022 Feb 9;10(1):229-240. doi: 10.1080/21642850.2022.2037429. PMID: 35174000; PMCID: PMC8843161.
4. Frimpong SO, Arthur-Holmes F, Agyemang-Duah W. Financial vulnerability, health outcomes, and well-being of older adults during the COVID-19 pandemic. *J Glob Health.* 2022 Apr 23;**12**:03021. doi: 10.7189/jogh.12.03021. PMCID: PMC9034737.
5. Ahorsu, D., Lin, C., &Pakpour, A. The association between health status and insomnia, mental health, and preventive behaviors: the mediating role of fear of covid-19. *Gerontology and Geriatric Medicine,* 2020;**6:**233372142096608. https://doi.org/10.1177/2333721420966081
6. Fraser, S., Lagacé, M., Bongué, B., Ndeye, N., Guyot, J., Bechard, L., … & Tougas, F. Ageism and covid-19: what does our society's response say about us?. Age and Ageing, 2020;**49**(5):692-695. https://doi.org/10.1093/ageing/afaa097
7. Chang, E. and Levy, B. High prevalence of elder abuse during the covid-19 pandemic: risk and resilience factors. *American Journal of Geriatric Psychiatry,* 2021;**29**(11), 1152-1159. https://doi.org/10.1016/j.jagp.2021.01.007
8. Mayerl, H., Stolz, E., & Freidl, W. Longitudinal effects of covid-19-related loneliness on symptoms of mental distress among older adults in austria. Public Health, 2021;**200**:56-58. https://doi.org/10.1016/j.puhe.2021.09.009
9. Gosselin P, Castonguay C, Goyette M, Lambert R, Brisson M, Landreville P, Grenier S. Anxiety among older adults during the COVID-19 pandemic. *J Anxiety Disord.* 2022 Dec; 92:102633. doi: 10.1016/j.janxdis.2022.102633. Epub 2022 Sep 12. PMID: 36115079; PMCID: PMC9465474.
10. Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. The psychological impact of quarantine and how to reduce it: A rapid review of the evidence. *The Lancet*, 2020;**395**(10227), 912-920. https://doi.org/10.1016/S0140-6736(20)30460-8
11. Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310-357. https://doi.org/10.1037/0033-2909.98.2.310
12. Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., & Hu, S. Online mental health services in China during the COVID-19 outbreak. *The Lancet Psychiatry*, 2020;**7**(4), e17-e18. https://doi.org/10.1016/S2215-0366(20)30077-8
13. Pfefferbaum, B., & North, C. S. Mental health and the Covid-19 pandemic. *New England Journal of Medicine*, 2020;**383**(6), 510-512. https://doi.org/10.1056/NEJMp2008017

Immunization Revolution: Empowering Adults for A Healthier Tomorrow

O.P. Sharma[1], Haroon H[2], Sajesh Asokan[3], Vivek Handa[4]

Abstract

With the share of adults in the global population increasing, it is essential to address the unique challenges they face regarding vaccine uptake. The World Health Organization (WHO) plays a pivotal role in enhancing understanding and implementation of vaccination programs, aiming to ensure that vaccines are accessible to all, particularly the marginalized groups.

Immunization is defined as the process that strengthens an individual's immune response against specific pathogens, achieved through vaccines that contain antigens, adjuvants, and stabilizers. Various types of vaccines, including live-attenuated and mRNA vaccines, are designed to elicit a robust immune response. Despite the effectiveness of adult vaccines in preventing serious diseases, public awareness remains significantly lower compared to childhood vaccination programs. Factors contributing to this include emphasis on childhood health, misconceptions about adult susceptibility to diseases, and a lack of clear information regarding adult vaccination schedules.

Healthcare professionals (HCPs) are crucial in promoting adult vaccination through direct recommendations, education, and addressing vaccine hesitancy. They must build trust and transparency with patients while advocating for policies that enhance vaccination efforts. Ethical and legal considerations surrounding adult immunization programs are also discussed, emphasizing the need for equitable access and informed consent.

Challenges to achieving widespread adult immunization include systemic barriers, provider-level issues, and socio-economic factors that disproportionately affect certain populations. To overcome these obstacles, a multifaceted approach involving targeted education, improved access, and collaboration among various healthcare providers is essential. Ultimately, enhancing public awareness and participation in adult vaccination programs is vital for improving overall public health outcomes and reducing the incidence of vaccine-preventable diseases.

INTRODUCTION:

The share of adults within the global population is on the rise, and there are vaccines specifically formulated for adults, as aging contributes to a decline in the immune system's effectiveness against vaccines, referred to as immunosenescence, which poses a challenge in providing sufficient protection for this demographic.[1] The delivery of vaccines is vital to guarantee that individuals of all ages receive strong defence against various diseases that could lead to serious health issues. Utilizing its unique convening power, the World Health Organization (WHO) partners with countries around the world to enhance understanding of the critical importance of vaccines and immunization, while also ensuring that governments receive the necessary guidance and technical assistance required for the effective execution of high-quality vaccination programs that cater to their populations' requirements.[2]

The primary and overall aim of World Immunization Week observed in the last week of April is to increase the number of individuals and their respective communities who are effectively protected from diseases preventable through vaccination, thus improving public health results on a global level. By building partnerships and promoting the exchange of best practices, WHO seeks to establish a world where vaccines are available to everyone,

[1]Sr. Consultant Geriatric Medicine - Indraprastha Apollo Hospitals, New Delhi
[2]Department of Internal Medicine, Kasturba Medical College Mangalore, Manipal Academy of Higher Education, Karnataka,Manipal, 576104, India
Consultant **Department of Internal Medicine** KMC hospital Dr BR Ambedkar Circle Mangalore 575001
[3]Immediate Past President Geriatric Society of India
[4]Adj. Professor - Community Medicine, ESIC Medical College Faridabad
Former Deputy Medical Commissioner - Medical Education, ESIC

ultimately contributing to healthier communities and lower mortality rates from preventable illnesses. This collaborative strategy not only enables countries to enhance their healthcare systems but also advocates for health equity, ensuring that marginalized and at-risk groups receive the vaccinations essential for their well-being.[3]

IMMUNISATION

Immunization is the process by which an individual's immune system becomes fortified against an agent (known as an immunogen), typically through the administration of a vaccine. This process stimulates the production of antibodies and memory cells, which provide long-term protection against specific infectious diseases. Immunization can occur through natural infection or through vaccination, which introduces a harmless form of the pathogen or its components to elicit an immune response without causing the disease.[4] The goal of immunization is to reduce the incidence of infectious diseases and enhance public health by establishing herd immunity within populations.

VACCINE

A vaccine is a substance that introduces antigens derived from a pathogen to the immune system, prompting an adaptive immune response. This response includes the production of antibodies and the development of immunological memory, allowing for a more rapid and effective response upon subsequent exposure to the pathogen.[5]

VACCINE COMPOSITION AND TYPES

Different Types of Vaccines include live attenuated vaccines, inactivated or killed vaccines, subunit, recombinant, and conjugate vaccines, each designed to elicit an immune response tailored to the specific characteristics of the pathogens they target.[6]

Vaccines are made of various components that work together to stimulate the immune system. The main ingredients can include:

1. **Antigens**: These are the parts of the pathogen (virus or bacteria) that trigger an immune response. They can be in the form of weakened or inactivated forms of the pathogen, subunits of the pathogen, or part of genetic material from the pathogen.
2. **Adjuvants**: These substances enhance the body's immune response to the vaccine. They help to create a stronger and longer-lasting immunity.
3. **Stabilizers**: These are added to vaccines to help maintain their effectiveness during storage. Common stabilizers include sugars, proteins, or other substances that protect the vaccine from heat and freezing.
4. **Preservatives**: Some vaccines contain preservatives to prevent contamination by bacteria or fungi. Thimerosal (a mercury-containing compound) is one example, although many vaccines are now available in thimerosal-free formulations.
5. **Diluent**: This is a liquid used to dilute the vaccine to the appropriate concentration. It can be sterile water or saline.

Each vaccine has a specific formulation that is carefully designed to ensure safety and efficacy.

HERD IMMUNITY

Herd immunity is the phenomenon whereby a substantial segment of a population becomes immune to a specific infectious disease, either through vaccination or prior infections. This collective immunity offers protection to individuals who are not immune, thereby reducing the overall transmission of the disease within the community. When a sufficient number of people are immune, the spread of the disease diminishes, leading to fewer cases and safeguarding vulnerable populations. Herd immunity is vital for controlling outbreaks and highlights the importance of widespread vaccination programs for public health.[7]

AGE IMMUNE RESPONSES AND VACCINE EFFICACY

Age significantly impacts vaccine efficacy due to various changes in the immune system associated with aging. Age-related changes in the immune system significantly impact vaccine efficacy. Vaccine efficacy tends to decline with age, particularly noticeable in individuals over 65-70 years old, due to complex changes in both the innate and adaptive immune systems.[8] For instance, influenza vaccines exhibit reduced effectiveness in older adults, especially those over 85 years old, who often have higher medical comorbidities. Strategies to improve vaccine responses in older adults include the use of adjuvants, customised doses, and tailored vaccine formulations. Understanding and addressing these changes are crucial for enhancing vaccine efficacy in the aging population.[9]

Immunosenescence refers to the gradual dysregulation of immune functions associated with aging, resulting in diminished vaccine efficacy. This phenomenon encompasses alterations in various components of the immune system, including the lymph nodes, B cell compartment, T cell compartment, and innate immune pathways.[10] Additionally, older adults frequently experience a chronic low-level inflammatory state known as inflammaging, which negatively affects immune responses to vaccinations, is a significant concern.[11] As a result, studies are underway to investigate methods to reduce baseline inflammation in order to improve vaccine responses within this demographic. Aging significantly impacts the responses of B cells and T cells, which in turn influences vaccine effectiveness in older adults. In terms of B cells, aging leads to a reduction in "IgM memory" cell numbers and an increase in "age-related B cells," resulting in fewer specific antibodies being produced and a higher prevalence of autoreactive antibodies. This decline in B cell functionality contributes to lower vaccine efficacy in the elderly population. Similarly, T cell responses also diminish with age, complicating vaccination outcomes further. Older adults exhibit weakened T cell responses,[12] which are essential for achieving effective vaccination, highlighting the challenges posed by aging on the immune system's ability to respond to vaccines.

Current strategies to enhance vaccine efficacy, particularly in the elderly, include the use of adjuvants to stimulate local inflammation and administering higher vaccine doses; however, these methods have shown limited benefits.[13] There is an increasing

recognition of the need for vaccines specifically designed for the elderly, considering the unique changes in their immune systems. Consequently, novel vaccination strategies are being developed to address these age-related immune alterations.

VACCINES: SAFETY AND EFFICACY

vaccines are generally considered safe. They undergo rigorous testing in clinical trials to ensure their safety and efficacy before being approved for public use.vaccines are continuously monitored for any adverse effects once they are on the market. Serious side effects are rare.[14] While mild adverse events can occur, the benefits of vaccination in preventing serious illnesses far outweigh the risks.Regular updates and ongoing research ensure that vaccines remain safe and effective for all adult populations. Methods to monitor and assess vaccine safety are in place, with manufacturers, government agencies, and healthcare providers sharing responsibility for ensuring that vaccines are safe and used in a safe manner.

BENEFITS OF IMMUNIZATION - ECONOMIC IMPLICATIONS FOR HEALTH AND SOCIETAL STABILITY

Immunization offers significant economic advantages, impacting both individual health and societal stability. It ensures reduced healthcare costs by preventing expensive treatments, increased productivity through lower absenteeism, and decreased mortality rates, which contribute to a stable workforce and economic growth. Vaccination enhances quality of life, leading to better educational outcomes and participation in economic activities.[15] It also prevents disease outbreaks, reducing costly emergency responses, and represents an investment in the health of future generations. Moreover, widespread immunization helps maintain global economic stability by preventing the spread of diseases that could disrupt trade and travel.[16]

Vaccines recommended for adults can vary based on age, health status, occupation, and travel plans. Here are the different types of vaccines commonly recommended for adults and a typical age-wise vaccination schedule:

Vaccines Recommended for Adults

- **Influenza Vaccine**: Recommended annually for all adults, particularly those with chronic health conditions.
- **Tetanus, Diphtheria, and Pertussis (Tdap)**: A one-time dose of Tdap is recommended for adults who have not previously received it, followed by a Td booster every 10 years.
- **Human Papillomavirus (HPV)**: Recommended for adults up to age 26; catch-up vaccination is available for those aged 27 to 45 after discussing with a healthcare provider.
- **Measles, Mumps, and Rubella (MMR)**: Recommended for adults who have not been vaccinated or do not have evidence of immunity.
- **Varicella (Chickenpox)**: Recommended for adults who have never had chickenpox or the vaccine.
- **Zoster (Shingles)**: Recommended for adults aged 50 and older, with the Shingrix vaccine being preferred.
- **Pneumococcal Vaccines**: Recommended for adults aged 65 and older, and for younger adults with certain health conditions.
- **Hepatitis A and B Vaccines**: Recommended for adults who are at risk, including travellers to certain areas and those with specific health conditions.
- **Meningococcal Vaccines**: Recommended for certain adults, such as college students living in dormitories or travellers to areas where meningococcal disease is common.[17]

Model/sample Age-wise Vaccination Schedule for adults:[18]

§ **Ages 19-26**:
- Tdap (if not previously given)
- HPV (if not previously given)
- MMR (if not previously given)
- Annual Influenza vaccine

§ **Ages 27-49**:
- Tdap (if not previously given)
- Annual Influenza vaccine
- MMR (if not previously given)
- HPV (if not previously given, up to age 45)
- Varicella (if not previously given)

§ **Ages 50-64**:
- Tdap (if not previously given)
- Annual Influenza vaccine
- Shingles (Zoster) vaccine
- Pneumococcal vaccine (if at risk)
- MMR (if not previously given)
- Varicella (if not previously given)

§ **Ages 65 and older**:
- Tdap (if not previously given)
- Annual Influenza vaccine
- Shingles (Zoster) vaccine
- Pneumococcal vaccines
- MMR (if not previously given)
- Varicella (if not previously given)

It is essential for adults to consult with their healthcare providers to determine the appropriate vaccines based on their individual health needs and circumstances.

CHILDHOOD VERSUS ADULT IMMUNIZATION SCHEDULES

The immunization schedules for children and adults vary significantly in terms of vaccine types, timing, and health considerations. Childhood vaccines include routine immunizations such as Hepatitis B, DTaP, Hib, Polio, Pneumococcal conjugate, and MMR, with recent additions like combination vaccines to reduce doses and clinic visits. Special considerations are made for certain vaccines based on regional disease prevalence. In contrast, adult

vaccines consist of routine shots for Tetanus, Diphtheria, Tdap, Influenza, Pneumococcal, Herpes Zoster, and HPV, with additional recommendations based on specific risk factors. Vaccination for children starts at birth with multiple doses given at various intervals, while adults typically receive annual Influenza vaccines and periodic boosters, particularly those over 50 or with certain health conditions. Children's immune systems require multiple doses to build immunity, whereas adults may experience waning immunity and need boosters, especially those with chronic conditions.[19]

CHALLENGES IN ACHIEVING WIDESPREAD ADULT IMMUNIZATION

Achieving widespread adult immunization faces several significant challenges that can be categorized into systemic, provider-level, patient-level, and socio-economic barriers. Systemic barriers include limited resources and complex procedures within healthcare systems, which hinder access to vaccines, especially in underserved populations. Financial constraints, such as the high cost of vaccines and inadequate reimbursement for vaccination services, further complicate the situation. At the provider level, operational issues like poor documentation, workflow interruptions, and a lack of necessary storage equipment impede vaccination efforts, while acute medical care often takes precedence over preventive services. Additionally, healthcare providers may not have updated information on vaccines or effective communication skills to educate patients. Patient-level barriers include limited clinic hours, logistical difficulties, and the need for multiple visits, which can deter adults from getting vaccinated. Vaccine hesitancy, fuelled by fear of side effects and mistrust in the health system, also plays a significant role. Socio-economic factors contribute to disparities in immunization rates among racial and ethnic groups, influenced by inequities in education and income. Addressing these disparities requires culturally and linguistically appropriate healthcare services and targeted public education. Overall, improving vaccine knowledge and awareness through effective education campaigns is crucial to enhance understanding and acceptance of vaccines among adults.[20]

ROLE OF HEALTHCARE PROFESSIONALS IN PROMOTING ADULT VACCINATION

Vaccine hesitancy refers to the reluctance or refusal to vaccinate despite the availability of vaccines. It can stem from a variety of factors, including concerns about vaccine safety, distrust in the healthcare system or pharmaceutical companies, misinformation, cultural beliefs, and personal or philosophical beliefs. Vaccine hesitancy can significantly impact public health efforts, as it may lead to lower vaccination rates, which in turn can result in outbreaks of vaccine-preventable diseases.[21]

Healthcare professionals play a pivotal role in promoting adult vaccination through various mechanisms. Their influence on patient decisions is significant, as their own vaccination status and attitudes can boost public confidence in vaccines. Direct recommendations from HCPs are one of the most effective methods to increase vaccination rates, as patients are more likely to accept vaccines when endorsed by their healthcare providers. HCPs serve as trusted sources of information, educating patients about the benefits and safety of vaccines while addressing common misconceptions. Effective communication strategies are essential to overcoming vaccine hesitancy. Implementing reminder systems for patients and providers can significantly increase vaccination rates, while standing orders allow qualified professionals to administer vaccines without direct physician orders, streamlining the process. Understanding and addressing the specific barriers to vaccine hesitancy, such as concerns about side effects and misinformation, is crucial. HCPs should build a trust-based relationship with patients, being transparent about the benefits and risks of vaccines. Additionally, HCPs can advocate for policies that support vaccination efforts and engage with the community through public health campaigns.[22] They have a professional and ethical responsibility to promote vaccination, which includes staying informed about the latest recommendations and guidelines. Continuous education and training for HCPs are vital to ensure they possess up-to-date knowledge about vaccines, enabling them to effectively communicate this to patients. In conclusion, HCPs are central to the success of vaccination programs, and by leveraging their trusted position, they can significantly enhance vaccination rates and contribute to better public health outcomes.

ETHICAL AND LEGAL CONSIDERATIONS IN ADULT IMMUNIZATION PROGRAMS

Adult immunization initiatives encompass a range of ethical and legal factors that are crucial for their success and public acceptance. These factors can be divided into ethical guidelines, informed consent, and legal regulations. Ethical guidelines highlight the advantages for both individuals and the community, ensuring that the diseases being targeted are serious enough to warrant the related risks and costs. Justice and fairness are paramount, as programs must ensure equitable access to vaccines, especially for at-risk populations, while fostering transparency and trust through straightforward communication about the advantages and potential risks of vaccines.[23] Autonomy is equally important, requiring informed consent where individuals are provided with sufficient information to make voluntary choices regarding vaccination. Care should be taken with those who might not have the ability to make informed decisions, involving surrogate decision-makers when appropriate. Effective communication methods are vital for clearly delivering information to diverse groups. Legally, the acceptability of mandatory versus voluntary vaccination differs by jurisdiction, with some areas advocating for mandatory measures to achieve herd immunity, while others emphasize individual autonomy.[24] Legal structures must also include the regulation and oversight of vaccines after they are licensed to guarantee their continued safety and efficacy, along with systems for compensating individuals who suffer adverse effects from vaccines, thus preserving public confidence and addressing the risks linked to vaccination.

BRIDGING THE GAP: ENHANCING PUBLIC AWARENESS OF ADULT IMMUNIZATION

Public awareness regarding adult immunization is notably lower than that of childhood vaccination programs, primarily due to several interrelated factors. Historically, there has been a strong emphasis on childhood health, as infants and young children are particularly vulnerable to infectious diseases. This focus has resulted in extensive public health campaigns aimed at parents, which often overshadow the importance of vaccinations for adults. Additionally, many adults view themselves as less susceptible to vaccine-preventable diseases, especially when they are in good health, leading to a sense of complacency about the necessity of vaccinations in adulthood.[25] The lack of readily available information about adult vaccines, including recommended schedules and types, further complicates the issue, as these recommendations are often less publicized and more complex than those for children. Healthcare providers also play a crucial role; if they do not consistently discuss or recommend adult immunizations during routine check-ups, opportunities for education and vaccination may be missed. Misconceptions about the necessity and effectiveness of adult vaccines persist, with some adults believing that childhood vaccinations suffice for a lifetime. Moreover, logistical challenges such as busy schedules and limited access to vaccination sites can deter adults from seeking immunizations. Lastly, public health messaging tends to prioritize childhood vaccinations, resulting in diminished visibility for adult immunization efforts in media and community outreach. Addressing these challenges through targeted education and outreach initiatives is essential to enhance public awareness and increase adult vaccination rates.[26] By combining these approaches, communities can significantly enhance awareness and participation in adult vaccination programs.

CONCLUSION

Adult vaccines are highly effective in preventing morbidity and mortality from various infectious diseases. However, to fully realize their benefits, efforts must be made to improve vaccination rates through education, access, and consistent healthcare recommendations. Ethical and legal considerations in adult immunization programs are also complex and multifaceted. They require a balance between individual rights and public health benefits, transparent communication, and robust legal frameworks to ensure the safety, effectiveness, and acceptability of vaccination programs. To overcome barriers to vaccine uptake, a multifaceted approach is essential. This includes implementing multimodal interventions such as operational planning, clinical reminders, on-site vaccination, patient education, and financial incentives, which can significantly enhance vaccination rates. Additionally, focusing on integration and collaboration by engaging a wider array of vaccinators, including pharmacists, and merging immunization services with other preventive care can improve accessibility and coverage. Furthermore, the establishment of national guidelines for adult vaccination, alongside the setting of aspirational coverage targets, can create a clear framework aimed at boosting immunization rates. Addressing these considerations is essential for the success of immunization efforts and the protection of public health.

REFERENCES

1. Verma R, Khanna P, Chawla S. Adult immunization in India: Importance and recommendations. *Human Vaccines & Immunotherapeutics*. 2014; doi: 10.4161/HV.29342.
2. Aguado MT, Barratt J, Beard JR, Blomberg BB, Chen WH, Hickling J, Hyde TB, Jit M, Jit M, Jones R, et al. Report on WHO meeting on immunization in older adults: Geneva, Switzerland, 22-23 March 2017. *Vaccine*. 2018; doi: 10.1016/J.VACCINE.2017.12.029.
3. Khorsand P, Chowdhury M, Wyns A, Velin L, Wangari M-C, Cipriano GC, El Omrani O, Patil P, van Daalen KR. Envisioning sustainable and equitable World Health Assemblies. *BMJ Global Health*. 2022; doi: 10.1136/bmjgh-2022-009231.
4. Calle S. Advancements in the Field of Vaccines and Immunization. *Journal of Vaccines and Vaccination*. 2020; doi: 10.35248/2157-7560.20.11.E418.
5. Sanghi D, Tiwle R. A Detail Comprehensive Review On Vaccines. IJRDPL [Internet]. 2014Mar.15 [cited 2025Apr.28];3(2):854-62. Available from: https://www.ijrdpl.com/index.php/ijrdpl/article/view/376
6. Roses M, Bonvehí PE. Vaccines in adults. *Medicina (B Aires)*. 2019;79(Spec 6/1):552-558. English. PMID: 31864225.
7. Metcalf CJE, Metcalf CJE, Ferrari MJ, Graham AL, Grenfell BT, Grenfell BT. Understanding Herd Immunity. *Trends in Immunology*. 2015; doi: 10.1016/J.IT.2015.10.004.
8. Gustafson CE, Gustafson CE, Kim C, Kim C, Weyand CM, Weyand CM, Goronzy JJ, Goronzy JJ. Influence of immune aging on vaccine responses. *The Journal of Allergy and Clinical Immunology*. 2020; doi: 10.1016/J.JACI.2020.03.017.
9. Weinberger B. Vaccines for the elderly: current use and future challenges. Immun Ageing. 2018 Jan 22;15:3. doi: 10.1186/s12979-017-0107-2. PMID: 29387135; PMCID: PMC5778733.
10. Crooke SN, Ovsyannikova IG, Poland GA, Kennedy RB. Immunosenescence: A systems-level overview of immune cell biology and strategies for improving vaccine responses. Experimental Gerontology. 2019; doi: 10.1016/J.EXGER.2019.110632.
11. Salminen A, Kaarniranta K, Kauppinen A. Inflammaging: disturbed interplay between autophagy and inflammasomes. 2012; doi: 10.18632/AGING.100444.
12. Frasca D, Blomberg BB. Aging induces B cell defects and decreased antibody responses to influenza infection and vaccination. *Immunity & Ageing*. 2020; doi: 10.1186/S12979-020-00210-Z.
13. Bell MRG, Kutzler MA. An old problem with new solutions: Strategies to improve vaccine efficacy in the elderly. *Advanced Drug Delivery Reviews*. 2022; doi: 10.1016/j.addr.2022.114175.
14. Di Pasquale A, Bonanni P, Garçon N, Stanberry LR, El-Hodhod MA, Da Silva FT. Vaccine safety evaluation: Practical aspects in assessing benefits and risks. *Vaccine*. 2016; doi: 10.1016/J.VACCINE.2016.10.039.
15. Bonanni P, Picazo JJ, Rémy V. The intangible benefits of vaccination - what is the true economic value of vaccination? *J Mark Access Health Policy*. 2015 Aug 12;3. doi: 10.3402/jmahp.v3.26964. PMID: 27123182; PMCID: PMC4802696. doi: 10.3402/JMAHP.V3.26964.
16. Rémy V, Zöllner Y, Heckmann U. Vaccination: the cornerstone of an efficient healthcare system. *J Mark Access Health Policy*. 2015 Aug 12;3. doi: 10.3402/jmahp.v3.27041. PMID: 27123189; PMCID: PMC4802703. doi: 10.3402/JMAHP.V3.27041.
17. Weinberger B. Vaccination of Adults and the Older Population against Tetanus, Diphtheria, Pertussis, and Tick-Borne Encephalitis: The Importance of Booster Vaccinations throughout Life. *Interdiscip Top GerontolGeriatr*. 2020;43:146-157. doi: 10.1159/000504489. Epub 2020 Apr 9. PMID: 32305971.
18. Murthy N, Wodi AP, McNally VV, Cineas S, Ault KA. Advisory Committee on Immunization Practices Recommended Immunization Schedule for Adults Aged 19 Years or Older — United States, 2023. Morbidity and Mortality Weekly Report. 2023; doi: 10.15585/mmwr.mm7206a2.
19. Orge, M.P., Vidal, P., Barrios, J., & Fernández, J.U. (2018). Vaccinating is not just a matter for children: Adult immunization schedule. *Vacunas, 19*, 4-7. doi: 10.1016/J.VACUNE.2018.03.004.
20. Lanza TE, Lombardi GS, Paladini A, Castagna CA, Cadeddu C. Barriers and strength factors of adult immunization plans in seven countries of the European Region. *Population medicine*. 2023; doi: 10.18332/popmed/165200.
21. Dutta A, Sachdeva S, Hamdy Mahd ATM. Understanding the Lacunae in Knowledge and Attitude Leading to Vaccine Hesitancy. *Journal of Vaccines and Vaccination*. 2020; doi: 10.35248/2157-7560.20.11.413.
22. Pikkel Geva HZ, Gershgoren H, Nir D, Khazen M, Rose AJ. Vaccine hesitancy among health-care professionals in the era of COVID-19. Health Education Research. 2023; doi: 10.1093/her/cyad003.
23. Amin ANE, Parra MT, Kim-Farley R, Fielding JE. Ethical Issues Concerning Vaccination Requirements. Public health reviews. 2012; doi: 10.1007/BF03391666.
24. Franc A, Bíba V. Ethical and legal requirements for vaccination against COVID-19. *Ceska Slov Farm*. 2022 Winter;**71**(1):3-12. English. PMID: 35387459.
25. Tan L. A review of the key factors to improve adult immunization coverage rates: What can the clinician do? *Vaccine*. 2017; doi: 10.1016/J.VACCINE.2017.07.050.
26. Tsimtsiou Z, Tatsioni A, Gkizlis V, Kolokas K, Papaioannou A, Birka S, Tirodimos I, Tsiligianni I. Under-Vaccination in Adults: Qualitative Insights Into Perceived Barriers Reported by Vaccine Supporters, Undecided and Refuters. *The Journal of Primary Prevention*. 2021; doi: 10.1007/S10935-021-00650-3.

Cognitive Shadows: The Enduring Impact of Social Isolation on Older Adults During Pandemic Recovery

Rahul Garg[1]

Abstract

The COVID-19 pandemic imposed unprecedented restrictions on social interactions worldwide, with particularly severe consequences for older adults who faced stricter isolation measures due to their higher vulnerability to the virus. This review examines the emerging evidence on how social isolation during and after the pandemic has affected cognitive function in older populations. Drawing on pre-pandemic research establishing links between social isolation, loneliness, and cognitive decline, this article synthesizes recent findings to assess how pandemic-related isolation may influence long-term cognitive outcomes. The evidence suggests that prolonged isolation during pandemic recovery periods may accelerate cognitive decline in older adults through multiple pathways, including reduced cognitive stimulation, increased psychological distress, disrupted routines, and decreased access to healthcare services. Importantly, the effects appear to persist beyond the acute phase of the pandemic, raising concerns about enduring cognitive impacts as societies transition to post-pandemic life. This review highlights the urgent need for targeted interventions to mitigate these effects and identifies important directions for future research on this critical public health issue.

INTRODUCTION

The COVID-19 pandemic has presented unprecedented challenges to global public health, with particularly severe consequences for older adults. Beyond the direct risk of viral infection, pandemic-related restrictions profoundly disrupted social connections and daily routines that are vital for maintaining cognitive health in later life. As societies progress through pandemic recovery, understanding the long-term cognitive impacts of prolonged social isolation on older adults has emerged as a critical public health priority.

Even before the pandemic, substantial research documented associations between social isolation, loneliness, and adverse cognitive outcomes in older populations (Boss et al., 2015; Evans et al., 2019; Lara et al., 2019)[1,2,3]. Social engagement has been recognized as a key protective factor against cognitive decline, with evidence suggesting that socially integrated older adults maintain better cognitive function over time (Fratiglioni et al., 2000; Wang et al., 2002)[4,5]. The pandemic, however, forced many older adults into extended periods of isolation unprecedented in both duration and intensity.

This review examines the emerging evidence on how social isolation during the pandemic and recovery periods affects cognitive function in older adults. It begins by summarizing pre-pandemic research establishing connections between social isolation and cognitive decline, then explores how the unique circumstances of pandemic-related isolation may influence cognitive outcomes. The article synthesizes current findings on observed cognitive changes during and after pandemic restrictions, discusses potential mechanisms underlying these effects, and concludes with implications for post-pandemic recovery initiatives and future research directions.

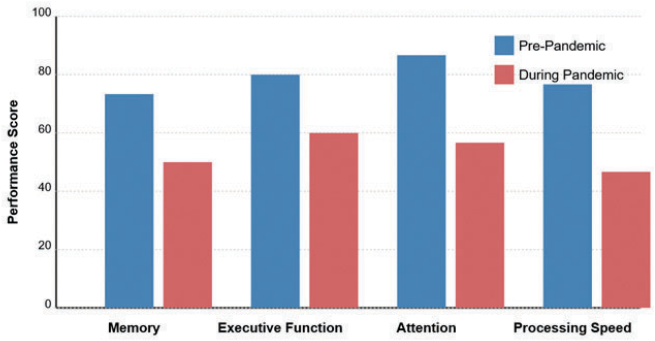


Figure 1: Comparison of cognitive performance across four domains before and during the pandemic. (Data adapted from De Pue et al., 2021)

[1]*Associate Professor, Department of Medicine, FH Medical College and Hospital, Agra*

PRE-PANDEMIC EVIDENCE: SOCIAL ISOLATION AND COGNITIVE FUNCTION

Established Links Between Social Isolation and Cognitive Decline

Prior to the COVID-19 pandemic, a substantial body of research had established strong associations between social isolation, loneliness, and adverse cognitive outcomes in older adults. A systematic review by Boss et al. (2015) found consistent evidence linking loneliness to poorer cognitive function across multiple domains, including global cognition, memory, and processing speed[1]. Similarly, Evans et al. (2019) conducted a meta-analysis revealing that socially isolated older adults exhibited poorer cognitive function compared to their more socially integrated counterparts, with effect sizes comparable to other established risk factors for cognitive decline[2].

Longitudinal research has been particularly compelling in demonstrating causal relationships between social disconnection and cognitive deterioration. Fratiglioni et al. (2000) conducted a community-based longitudinal study showing that limited social networks significantly increased the risk of dementia development, even after controlling for other risk factors[4]. Similarly, Wilson et al. (2007) found that feeling lonely was associated with more than double the risk of developing Alzheimer's disease over a 4-year follow-up period[6]. Tilvis et al. (2004) demonstrated that loneliness was an independent predictor of cognitive decline over a 10-year period among aged people, further strengthening the evidence for a causal relationship[7].

These pre-pandemic findings are critically important for contextualizing pandemic-related isolation effects. If social isolation under typical circumstances contributes to cognitive decline, the more extreme and prolonged isolation experienced during the pandemic may have magnified these effects. As Sundström et al. (2020) noted in their research prior to COVID-19, loneliness increased the risk of all-cause dementia and Alzheimer's disease, suggesting that pandemic isolation might accelerate cognitive deterioration for many older adults[8].

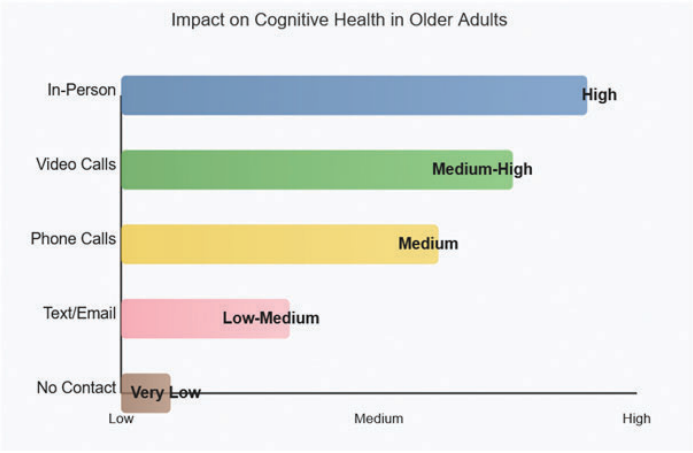


Figure 2: Relative impact of different social contact modalities on cognitive health in older adults during pandemic isolation. (Based on data from Arpino et al., 2021)

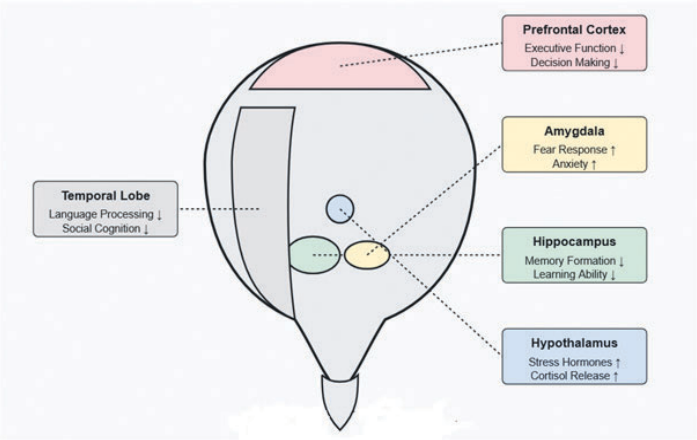


Figure 3: Neurobiological effects of social isolation on brain regions critical for cognitive function in older adults. (Based on data from Bzdok & Dunbar, 2020)

Mechanisms Linking Social Isolation to Cognitive Decline

Several theoretical mechanisms help explain how social isolation may influence cognitive function. Social engagement provides cognitive stimulation through complex interpersonal interactions, problem-solving, and communication, all of which may build cognitive reserve (Wang et al., 2002)[5]. Conversely, social isolation reduces exposure to these cognitively stimulating interactions, potentially accelerating cognitive aging processes.

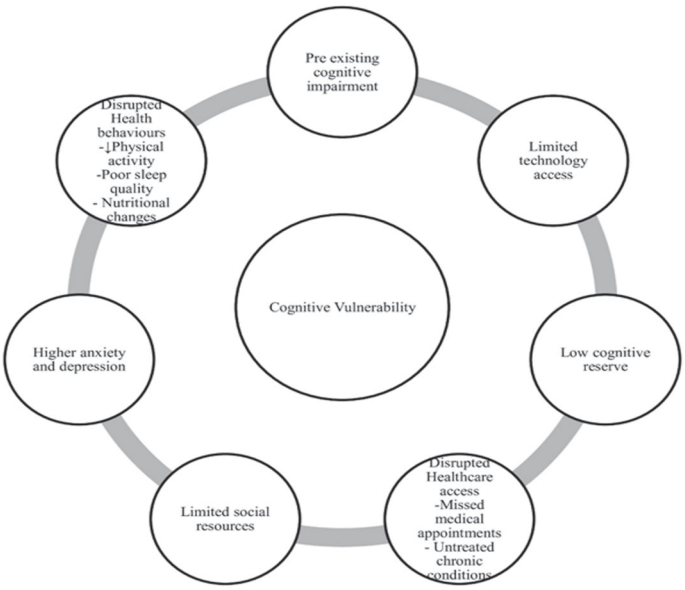


Figure 4: Risk factors contributing to cognitive vulnerability during pandemic isolation in older adults.

Psychological pathways also play important roles, as loneliness and isolation frequently trigger depression, anxiety, and stress responses that can directly impact cognitive function (Lara et al., 2019).[3] Tiwari (2013) conceptualized loneliness as a disease state with physiological consequences, including chronic inflammation and stress hormone dysregulation, both of which can affect brain health and cognitive function.[9]

Behavioral mechanisms provide additional explanatory pathways. Socially isolated individuals often engage in fewer health-promoting behaviors, including physical activity, healthy eating, and regular healthcare utilization, all of which indirectly support cognitive health (Livingston et al., 2017, 2020).[10,11] These behavioral changes may be particularly relevant during pandemic conditions, when access to health services and opportunities for physical activity were significantly constrained.

UNIQUE FEATURES OF PANDEMIC-RELATED ISOLATION

Distinct Characteristics of COVID-19 Isolation

The social isolation experienced during the COVID-19 pandemic differs from typical isolation in several important ways that may have amplified its cognitive impact. First, pandemic isolation was characterized by its abruptness and involuntary nature. Unlike gradual social disengagement that sometimes occurs with aging, pandemic restrictions were suddenly imposed, giving older adults little time to develop coping strategies (Armitage & Nellums, 2020; Hwang et al., 2020).[12,13]

Second, the comprehensive nature of pandemic isolation distinguished it from more common forms of social disconnection. Many older adults experienced simultaneous disruptions across multiple social contexts, including family visits, community activities, religious services, and healthcare appointments (Hugelius et al., 2021).[14] This multilayered isolation limited the compensatory strategies older adults might typically employ when one social avenue is restricted.

Third, the extended duration of isolation measures during the pandemic was unprecedented. While pre-pandemic research often studied chronic isolation developing over years, the concentrated intensity of pandemic isolation compressed this experience into a much shorter timeframe, potentially accelerating negative effects (Galea et al., 2020)[15]. As Bzdok and Dunbar (2020) noted in their neurobiology research, the human brain responds to social isolation as a form of threat, triggering stress responses that can be particularly harmful when sustained over extended periods.[16]

Role of Fear and Anxiety

The pandemic introduced unique psychological dimensions to isolation that may have exacerbated its cognitive effects. Isolation occurred against a backdrop of existential threat and mortality awareness that distinguishes it from typical social disconnection. Many older adults experienced heightened fear due to their greater vulnerability to severe COVID-19 outcomes (Herrera-Esposito & de los Campos, 2022), which likely intensified stress responses already associated with isolation.[17]

Media consumption during isolation may have further amplified these effects. Constant exposure to pandemic-related news and mortality statistics created a climate of sustained anxiety that could have interacted with isolation to worsen cognitive impacts (Galea et al., 2020).[15] This combination of isolation and fear may have created particularly toxic conditions for cognitive health among older adults.

OBSERVED COGNITIVE CHANGES DURING AND AFTER PANDEMIC ISOLATION

Evidence of Cognitive Decline

Emerging research has begun documenting cognitive changes among older adults during and after pandemic isolation. De Pue et al. (2021) conducted a study examining the impact of the COVID-19 pandemic on well-being and cognitive functioning in older adults, finding significant declines in multiple cognitive domains, including memory, attention, and executive function. Notably, these effects were more pronounced among those reporting greater loneliness and reduced social contact.[18] Figure 1 presents comparative data on cognitive performance across four domains before and during the pandemic. Consistent with De Pue et al.'s (2021) findings, all cognitive domains show significant decline during pandemic isolation, with memory and processing speed demonstrating the most substantial reductions compared to pre-pandemic baseline.[18]

Similar findings were reported by Noguchi et al. (2021), who conducted a longitudinal study in Japan examining self-reported cognitive decline among older adults during the pandemic. They found that social isolation was significantly associated with increased reports of cognitive difficulties, with effects persisting even after adjusting for other pandemic-related factors like anxiety and decreased physical activity[19].

For individuals with pre-existing cognitive impairments, the cognitive impact of pandemic isolation appears particularly severe. Chen et al. (2021) conducted a one-year follow-up study of patients with mild cognitive impairment (MCI), Alzheimer's disease, and dementia with Lewy bodies in China. They observed accelerated

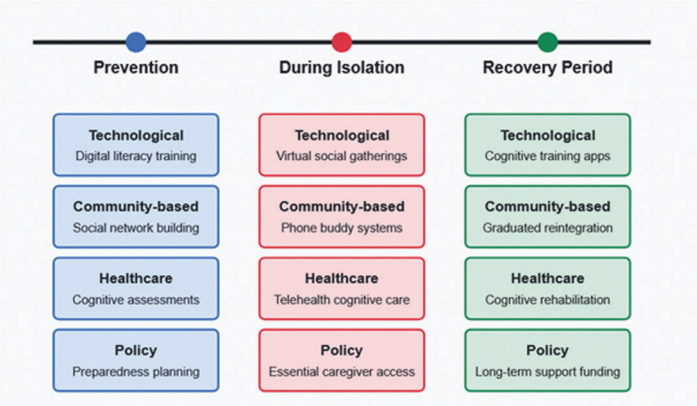


Figure 5: Intervention framework for mitigating cognitive impacts of social isolation in older adults.

cognitive decline compared to expected trajectories based on pre-pandemic data, especially among those experiencing greater social isolation.[20] This finding is concerning given that dementia with Lewy bodies is already characterized by rapid cognitive deterioration (Kramberger et al., 2017; Rongve et al., 2016), suggesting pandemic isolation may have compounded an already aggressive disease course.[21,22]

Intriguingly, some research indicates the relationship between pandemic isolation and cognitive function may be bidirectional. Kobayashi et al. (2022) found that pre-existing cognitive vulnerabilities predicted greater susceptibility to the negative mental health effects of isolation, creating potential feedback cycles that could accelerate cognitive decline over time.[23]

Variations in Impact Across Different Populations

The cognitive impact of pandemic isolation has not been uniform across all older adult populations. Several factors appear to moderate these effects, including pre-existing cognitive reserve, social resources, and technology access. Okely et al. (2021) found that older adults with higher pre-pandemic cognitive function and educational attainment showed greater resilience to isolation-related cognitive changes, suggesting that cognitive reserve may have protected against some isolation effects.[24]

Social resources also appear to play important moderating roles. Arpino et al. (2021) documented how alternative forms of social connection, such as phone calls and video chats, partially mitigated isolation effects for some older adults during pandemic lockdowns in France, Italy, and Spain. However, they noted significant disparities in access to these technological solutions, with socioeconomically disadvantaged older adults less able to maintain social connections through digital means[25]. As illustrated in Figure 2, different modalities of social contact demonstrate varying levels of cognitive benefit for older adults. While in-person interactions provide the highest cognitive stimulation, technology-mediated connections offer graduated benefits, with video calls providing greater cognitive engagement than phone calls or text-based communication (Arpino et al., 2021).[25]

Geographic and cultural contexts have further influenced isolation experiences and their cognitive consequences. Nogueira et al. (2022) compared pre- and post-lockdown cognitive status across different regions, finding that isolation impacts varied substantially based on local restrictions, cultural norms around social engagement, and community support systems.[26]

MECHANIMS UNDERLYING COGNITIVE EFFECTS OF PANDEMIC ISOLATION

Reduced Cognitive Stimulation

The cognitive stimulation hypothesis provides one compelling explanatory framework for pandemic-related cognitive changes. Social interactions typically provide rich cognitive stimulation through conversation, perspective-taking, and collaborative problem-solving (Wang et al., 2002).[5] Pandemic isolation dramatically reduced these opportunities for cognitive engagement, potentially accelerating normal age-related cognitive changes through disuse (Evans et al., 2019).[2]

The abrupt transition to digital communication during the pandemic may have further complicated cognitive stimulation patterns. While technologies like video conferencing provided some social connection, they often required different cognitive skills than in-person interaction, potentially creating additional cognitive burden for older adults less familiar with these platforms (Arpino et al., 2021).[25]

Psychological Distress and Stress Responses

Psychological distress represents another critical pathway linking pandemic isolation to cognitive changes. Isolation, loneliness, and fear during the pandemic triggered significant psychological distress among many older adults, with consequent impacts on cognitive function (De Pue et al., 2021).[18] Research by Kobayashi et al. (2022) documented strong cross-sectional and longitudinal associations between pandemic-related psychological distress and cognitive performance among middle-aged and older US adults.[23]

Neurobiological stress responses likely mediated these effects. Bzdok and Dunbar (2020) described how social isolation activates stress response systems, leading to increased cortisol production and inflammatory markers that can directly impact brain function. Chronic activation of these systems during prolonged pandemic isolation may have accelerated neurodegenerative processes already present in aging brains[16]. Figure 3 illustrates the neurobiological impact of social isolation on key brain regions involved in cognitive function. As depicted, prolonged isolation affects the prefrontal cortex (reducing executive function), hippocampus (impairing memory formation), amygdala (increasing fear responses), hypothalamus (elevating stress hormones), and temporal lobe (altering language processing and social cognition) (Bzdok & Dunbar, 2020).[16]

Disruption of Health-Promoting Behaviors

Pandemic restrictions significantly disrupted health-promoting behaviors that support cognitive health in older adults. Physical activity, which has robust associations with cognitive maintenance, decreased substantially during lockdown periods (Okely et al., 2021).[24] Dietary patterns, sleep quality, and alcohol consumption also changed for many older adults during isolation, often in ways unfavorable for cognitive health (De Pue et al., 2021).[8]

Healthcare disruptions may have been particularly consequential. Many older adults experienced reduced access to routine medical care, chronic disease management, and cognitive health monitoring during pandemic restrictions (Galea et al., 2020).[15] These disruptions may have allowed treatable conditions affecting cognition to progress unchecked, compounding direct isolation effects.

Figure 4 presents a conceptual model of factors contributing to

cognitive vulnerability during pandemic isolation. This model synthesizes the research on differential impacts across older adult populations, highlighting how pre-existing conditions, socioeconomic factors, psychological states, and access to resources interact to determine cognitive outcomes during periods of social isolation (Kobayashi et al., 2022; Okely et al., 2021; Noguchi et al., 2021).[19,23,24]

LONG-TERM IMPLICATIONS AND RECOVERY CONSIDERATIONS

Trajectories of Recovery or Persistent Effects

A critical question emerging from this research concerns recovery trajectories: will cognitive effects of pandemic isolation resolve as social connections resume, or might some impacts persist long-term? Early evidence suggests a mixed picture. Nogueira et al. (2022) found that some cognitive parameters showed significant improvement when measuring pre- and post-lockdown changes, suggesting resilience and recovery capacity among certain older adults.[26]

However, other research points to more concerning possibilities of sustained effects. Chen et al. (2021) found that accelerated cognitive decline among patients with neurodegenerative conditions persisted even after isolation measures eased, suggesting that pandemic isolation may have triggered or accelerated pathological processes not easily reversed by resumed social contact.[20] This finding aligns with pre-pandemic research by Lara et al. (2019), which suggested that loneliness contributes to mild cognitive impairment and dementia through physiological mechanisms that may persist beyond the lonely experience itself.[3]

Individual differences in recovery capacity appear significant, with pre-existing cognitive reserve, social resources, and psychological resilience all influencing recovery trajectories (Okely et al., 2021). Those with stronger cognitive and social reserves prior to the pandemic have generally shown greater recovery capacity as restrictions ease.[24]

Implications for Post-Pandemic Support and Intervention

These findings have important implications for post-pandemic recovery initiatives targeting older adults. First, they highlight the urgent need for cognitive monitoring and assessment as part of standard healthcare for older adults who experienced significant isolation during the pandemic. Early detection of cognitive changes could facilitate timely intervention before deficits become entrenched (Livingston et al., 2020).[11]

Second, they suggest that social reintegration should be conceptualized as a critical health intervention rather than merely a quality-of-life consideration. Programs facilitating safe social reconnection may provide vital cognitive benefits alongside psychological well-being (Hwang et al., 2020).[13] However, these programs must recognize that social reintegration may be challenging after prolonged isolation, requiring graduated approaches rather than abrupt transitions.

Third, they emphasize the importance of addressing psychological sequelae of isolation alongside cognitive concerns. Interventions targeting pandemic-related anxiety, depression, and trauma may indirectly support cognitive recovery by reducing psychological distress that contributes to cognitive difficulties (Kobayashi et al., 2022).[23] A comprehensive framework for addressing cognitive impacts of social isolation across different pandemic phases is proposed in Figure 5, highlighting technological, community-based, healthcare, and policy approaches that can be implemented during prevention, isolation, and recovery periods.

CONCLUSION

Evidence suggests pandemic-related isolation negatively impacted older adults' cognitive health through reduced stimulation, increased psychological distress, and disrupted health behaviors. These effects were more severe in those with pre-existing cognitive vulnerabilities and limited social resources. While some individuals demonstrate resilience as social connections resume, others show persistent cognitive effects requiring intervention. The interaction between isolation and existing dementia risk deserves particular attention, as pre-pandemic evidence linked social isolation to increased dementia risk. Research should examine whether pandemic isolation has potentially accelerated dementia incidence rates. As society continues pandemic recovery, addressing cognitive health in previously isolated older adults remains a public health priority.

REFERENCES

1. Boss L, Kang DH, Branson S. Loneliness and cognitive function in the older adult: a systematic review. *Int Psychogeriatr.* 2015;**27**(4):541-53.
2. Evans IEM, Martyr A, Collins R, Brayne C, Clare L. Social isolation and cognitive function in later life: a systematic review and meta-analysis. *J Alzheimers Dis.* 2019;**70**(s1):S119-44.
3. Lara E, Caballero FF, Rico-Uribe LA, Olaya B, Haro JM, Ayuso-Mateos JL, *et al*. Are loneliness and social isolation associated with cognitive decline? *Int J Geriatr Psychiatry.* 2019;**34**(11):1613-22.
4. Fratiglioni L, Wang HX, Ericsson K, Maytan M, Winblad B. Influence of social network on occurrence of dementia: a community-based longitudinal study. *Lancet.* 2000;**355**(9212):1315-9.
5. Wang HX, Karp A, Winbald B, Fratiglioni L. Late-life engagement in social and leisure activities is associated with a decreased risk of dementia: a longitudinal study from the Kungsholmen project. *Am J Epidemiol.* 2002;**155**(12):1081-7.
6. Wilson RS, Krueger KR, Arnold SE, Schneider JA, Kelly JF, Barnes LL, *et al*. Loneliness and risk of Alzheimer disease. *Arch Gen Psychiatry.* 2007;**64**(2):234-40.
7. Tilvis RS, Kähönen-Väre MH, Jolkkonen J, Valvanne J, Pitkala KH, Strandberg TE. Predictors of cognitive decline and mortality of aged people over a 10-year period. *J Gerontol.* 2004;**59**(3):M268-74.
8. Sundström A, Adolfsson AN, Nordin M, Adolfsson R. Loneliness increases the risk of all-cause dementia and alzheimer's disease. *J Gerontol.* 2020;**75**(5):919-26.
9. Tiwari SC. Loneliness: a disease? *Indian J Psychiatry*. 2013;**55**(4):320-2.
10. Livingston G, Sommerlad A, Orgeta V, Costafreda SG, Huntley J, Ames D, *et al*. Dementia prevention, intervention, and care. *Lancet.* 2017;**390**(10113):2673-734.
11. Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, *et al*. Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *Lancet.* 2020;**396**(10248):413-46.
12. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. *Lancet Public Health*. 2020;**5**(5):e256.
13. Hwang TJ, Rabheru K, Peisah C, Reichman W, Ikeda M. Loneliness and social isolation during the COVID-19 pandemic. *Int Psychogeriatr.* 2020;**32**(10):1217-20.
14. Hugelius K, Harada N, Marutani M. Consequences of visiting restrictions during the COVID-19 pandemic: an integrative review. *Int J Nurs Stud.* 2021;**121**:104000.
15. Galea S, Merchant RM, Lurie N. The mental health consequences of COVID-19 and physical distancing: the need for prevention and early intervention. *JAMA Intern Med.* 2020;**180**(6):817-8.
16. Bzdok D, Dunbar RIM. The neurobiology of social distance. *Trends Cogn Sci.* 2020;**24**(9):717-33.
17. Herrera-Esposito D, de los Campos G. Age-specific rate of severe and critical SARS-CoV-2 infections estimated with multi-country seroprevalence studies. *BMC Infect Dis.* 2022;**22**(1):311.
18. De Pue S, Gillebert C, Dierckx E, Vanderhasselt MA, De Raedt R, Van den Bussche E. The impact of the COVID-19 pandemic on wellbeing and cognitive functioning of older adults. *Sci Rep.* 2021;**11**(1):4636.

19. Noguchi T, Kubo Y, Hayashi T, Tomiyama N, Ochi A, Hayashi H. Social isolation and self-reported cognitive decline among older adults in Japan: a longitudinal study in the COVID-19 pandemic. *J Am Med Dir Assoc*. 2021;**22**(7):1352-1356.e2.
20. Chen ZC, Liu S, Gan J, Ma L, du X, Zhu H, *et al*. The impact of the COVID-19 pandemic and lockdown on mild cognitive impairment, Alzheimer's disease and dementia with Lewy bodies in China: a 1-year follow-up study. *Front Psychiatry*. 2021;**12**:12.
21. Kramberger MG, Auestad B, Garcia-Ptacek S, Abdelnour C, Olmo CA, Garcia-Walker Z, *et al*. Long-term cognitive decline in dementia with Lewy bodies in a large multicenter, international cohort. *J Alzheimers Dis*. 2017;**57**(3):787-95.
22. Rongve A, Soennesyn H, Skogseth R, Oesterhus R, Hortobágyi T, Ballard C, *et al*. Cognitive decline in dementia with Lewy bodies: a 5-year prospective cohort study. *BMJ Open*. 2016;**6**(2):e010357.
23. Kobayashi LC, O'Shea BQ, Joseph C, Finlay JM. Acute relationships between mental health and cognitive function during the COVID-19 pandemic: longitudinal evidence from middle-aged and older US adults. SSM. 2022;2:100097.
24. Okely JA, Corley J, Welstead M, Taylor AM, Page D, Skarabela B, Change in physical activity, sleep quality, and psychosocial variables during COVID-19 lockdown: evidence from the Lothian birth cohort 1936. *Int J Environ Res Public Health*. 2021;**18**(1):1-16.
25. Arpino B, Pasqualini M, Bordone V. Physically distant but socially close? Changes in non-physical intergenerational contacts at the onset of the COVID-19 pandemic among older people in France, Italy and Spain. *Eur J Ageing*. 2021;**18**(2):185-94.
26. Nogueira J, Gerardo B, Silva AR, Pinto P, Barbosa R, Soares S, et al. Effects of restraining measures due to COVID-19: pre-and post-lockdown cognitive status and mental health. *Curr Psychol*. 2022;**41**(11):7383-92.

Management of Secondary Osteoporosis in Elderly

JayantaSharma[1], Mayank Sahu[2]

Abstract

India is at the cusp of a demographic shift with an ever-increasing geriatric population which has its own special health issues. Multi-comorbidities and polypharmacy are one of the primary facets of this sub-population. Conditions like frailty, sarcopaenia, diabetes mellitus, hypertension, chronic kidney and liver disease, hypogonadism and ongoing medications including corticosteroids add to the risk factors of osteoporosis which is so prevalent in this age-group. It is imperative to recognise correctible risk factors and timely address them to prevent additional disease burden in the geriatric subjects.

Keywords- *Geriatrics, osteoporosis, secondary osteoporosis, frailty, bone mineral density*

INTRODUCTION

Osteoporosis is widely associated with aging and hormonal decline, but a significant portion of cases stem from secondary causes—often overlooked in clinical practice. Secondary osteoporosis, affecting nearly 80 million people globally, arises from chronic diseases, endocrine disorders, malabsorption, or prolonged use of certain medications. It can occur in individuals of any age or sex, making early recognition essential. This article focuses on the classification, diagnosis, and management of secondary osteoporosis, with emphasis on identifying underlying conditions and tailoring treatment accordingly. By raising awareness and applying a structured clinical approach, healthcare providers can more effectively prevent fragility fractures and improve outcomes in at-risk populations.

OSTEOPOROSIS-DEFINITION

Osteoporosis is a disease that is characterized by low bone mass, deterioration of bone tissue, and disruption of bone microarchitecture: it can lead to compromised bone strength and an increase in the risk of fractures.

Secondary causes of osteoporosis should be considered in patients who suffera fragility fracture when 'traditional' risk factors are insufficient to explain the injury.

[1]Senior Consultant, Dept. of Internal Medicine, Geriatric Medicine and Gerontology, Apollo Multispecialty Hospital Kolkata

[2]DNB General Medicine PGY3 Dept. of Internal Medicine, Geriatric Medicine and Gerontology, Apollo Multispecialty Hospital Kolkata.

CLASSIFICATION

- Primary osteoporosis
  - Type I orPostmenopausal osteoporosis, caused by the deficiency of estrogen, mainly affecting the trabecular bone
  - Type II or Senile osteoporosis due to bone mass lost due to the aging of cortical and trabecular bones
- Secondary osteoporosis-Bone mass loss from various diseases, drugs and lifestyle changes

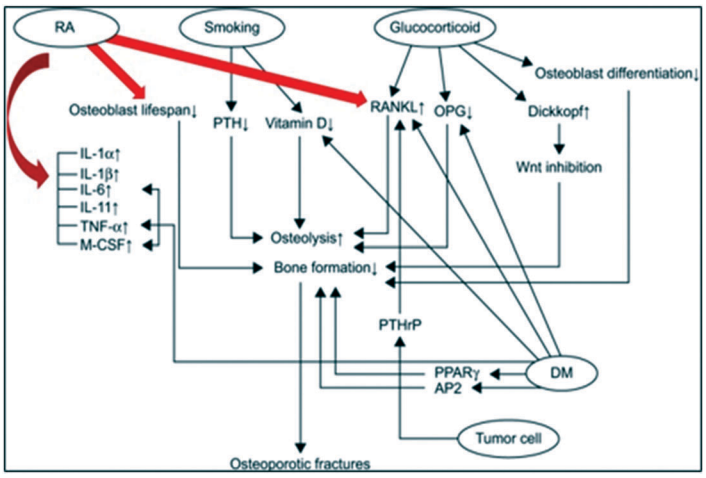


Figure- Interplay of factors in osteoporosis.

PREVALENCE

- Globally, prevalence of osteoporosis is 18.3%, with 23.1% in women and 11.7% in men.
- Overall prevalence of osteoporotic fractures in post-menopausal women in India is 82.2% (37.5% Osteoporosis, 44.7% Osteopaenia).
- Of the 200 million osteoporotic individuals globally, about 40% of them (80million) have secondary osteoporosis
- Upto 30% of postmenopausal women, >50% of premenopausal women, and between 50% and 80% of men have secondary osteoporosis

DRUGS THAT INCREASE FRACTURE RISK

- Corticosteroids (≥5mg prednisol one daily or equivalent for ≥3 months)
- Antiepileptics: carbamazepine, phenytoin, phenobarbitone
- Hypoglycaemics: thiazolidinediones
- Excessthyroxine
- Aromataseinhibitors
- Gonadotropin-releasing hormone
- Chemotherapy

or

- Immunosuppressants: cyclosporine, tacrolimus, methotrexate
- Lithium/SSRI/Anti-psychotics
- Heparin
- Proton pump inhibitors
- Aluminium containing antacids
- Depot medroxyprogesteron eacetate

Table: Secondary Causes of Osteoporosis

Disorder	Mostcommonfracturesite	Primarymechanism
Inflammatoryconditions		
Rheumatoid arthritis,SLE	Hip	Highboneturnoverduetopro- inflammatory cytokines
Crohn's disease, ulcerative colitis	Vertebrae	High bone turnover due to pro- inflammatory cytokines, malnutritionandmalabsorption
Hypogonadism		
Premature menopause (auto- immune, surgical, drugs)	Distal radius (Colles), vertebrae	High bone turnover from low oestrogen or low testosterone
Hypopituitarism (structural/functional)	Distal radius (Colles), vertebrae	High bone turnover from lowoestrogen or low testosterone
Glucocorticoidinduced/Cushing'ssyndrome	Vertebrae,ribs	Lowboneturnoverfromimpaired bone formation and mineralisation
Hyperthyroidism	Hip	High bone turnover from increased bone resorption
Primary hyperparathyroidism	Distal radius, vertebrae	High bone turnover from increased bone resorption
Hyperprolactinaemia	Distal radius, vertebrae	High bone turnover from oestrogen deficiency
Acromegaly	Vertebrae	Highboneturnover,increasein bone size and co-existing secondary hypogonadism
Diabetesmellitus	Hip	Low bone turnover from insulinopaenia in T1, ?cause in T2.
Malabsorption		
Pernicious anaemia	Vertebrae	Low bone turnover from impaired osteoblast recruitment
Coeliacdisease	Distal radius, vertebrae	High bone turnover due to malnutrition and malabsorption
Gastrectomy	Vertebrae	High bone turnover due to malnutrition and malabsorption
Haematological conditions		
Multiple myeloma and monoclonal gammopathy of unknown significance	Vertebrae	Uncoupling in bone turnover (high bone resorption and low bone formation)from pro-inflammatory cytokines
Myelo-proliferative disorders	Vertebrae	Direct marrow effects on bone
Systemic mastocytosis	Vertebrae	High bone turnover from mast cell mediators
Abnormalbonearchitecture		
Paget'sdisease	Long bones	High bone turnover from overactive bone resorption
Osteopetrosis	Hip, long bones	Low bone turnover from overactive bone resorption
Malignancy (primary or secondary)	Affectedbones	High bone turnover from paraneoplastic effects
Other conditions		
Chronic liver disease	Vertebrae	Low bone turnover from liver disease and increased bone resorption due to malabsorption, vitamin D deficiency and hypogonadism
Chronic kidney disease	Hip,vertebrae	High bone turnover from osteomalacia, secondary hyperparathyroidism or mixed bone disease, or low bone turnover from adynamic bone disease (from aluminium or iron)
Kidney transplantation	Vertebrae,Small bones	High bone turnover and tertiary hyperparathyroidism

APPROACH TO THE DIAGNOSIS AND MANAGEMENT OF OSTEOPOROSIS

- History– Comorbidity, Prior fracture, Medications, Smoking/ Alcohol
- Physical examination including BMI

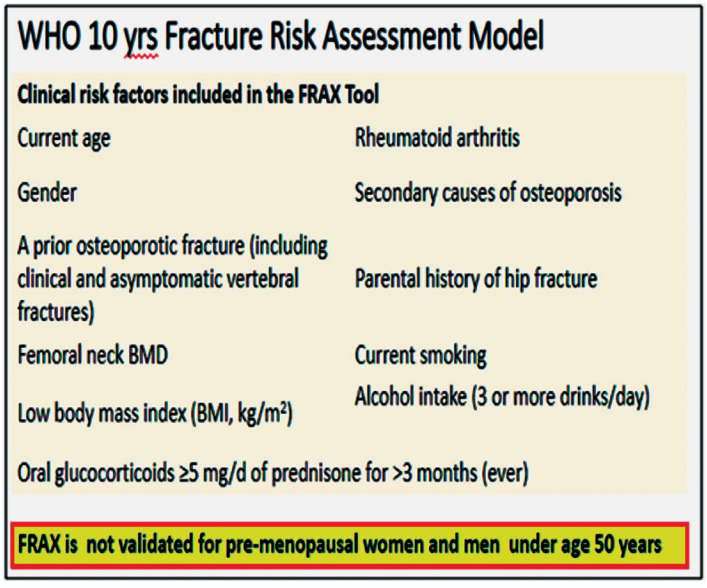
Generalscreening	
Full blood count, ESR or CRP	Myeloma screening
Serum calcium, phosphate, and magnesium	Serum testosterone, LH in men; FSH and Estradiol in premenopausal women
HbA_1c	
Parathyroidhormone, 25OHVitD	Celiacserology
Alkaline phosphatase (ALP)	24-hour urinary calcium excretion
Serum creatinine, eGFR	HIV antibodies
Thyroid-stimulating hormone	24-hour free urinary cortisol

INDICATIONS FOR BMD TESTING

- Women age 65 and older and men age 70 and older, regardless of clinical risk factors
- Younger postmenopausal women, women in the menopausal transition, and men age 50 to 69 with clinical risk factors for fracture
- Adults who have a fracture at or after age 50
- Adults with a condition (e.g., rheumatoid arthritis) or taking a medication (e.g., glucocorticoids in a daily dose ≥5 mg prednisone or equivalent for ≥3 months) associated with low bone mass or bone loss.

WHO DEFINITION OF OSTEOPOROSIS BASED ON BMD

Classification	BMD	T-score
Osteoporosis	2.5 SD or more below that of the mean level for a young-adult reference population	T-score at or below"2.5



- *In pre-menopausal women, men less than 50 years of age, and children ,the WHO BMD diagnostic classification should not be applied.*

MANAGEMENT OF PRIMARY OSTEOPOROSIS

- Here we present a short discussion on management of primary osteoporosis from the American College of Physicians guideline 2022.
- Our major focus stays on secondary osteoporosis which often gets lesser attention but is of at least equal importance in geriatric population.

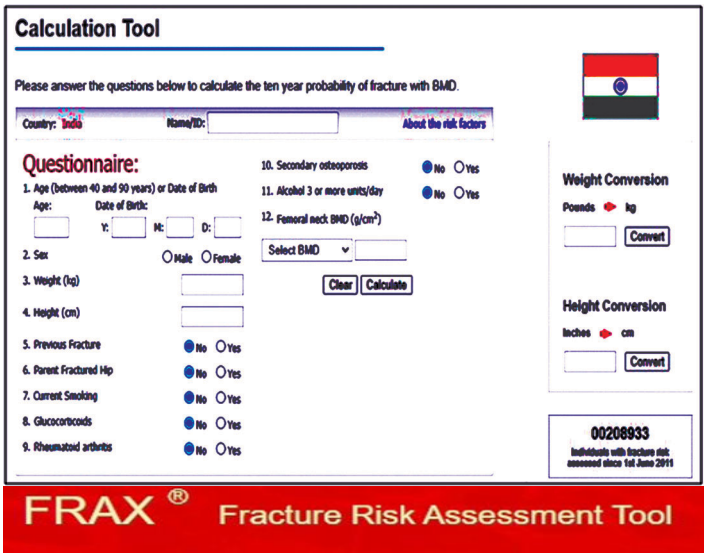
PHARMACOLOGIC TREATMENT OF PRIMARY OSTEOPOROSIS OR LOW BONE MASS TO PREVENT FRACTURES IN ADULTS: A LIVING CLINICAL GUIDELINE FROM THE AMERICAN COLLEGE OF PHYSICIANS 2022

Recommendation 1a: ACP recommends that clinicians use bisphosphonates for initial pharmacologic treatment to reduce the risk of fractures in postmenopausal females diagnosed with primary osteoporosis (strong recommendation; high-certainty evidence).

Recommendation 1b: ACP suggests that **clinicians use bisphosphonates** for initial pharmacologic treatment to reduce the risk of fractures in males diagnosed with primary osteoporosis (conditional recommendation; low- certainty evidence).

Recommendation 2a: ACP suggests that clinicians use the RANK ligand inhibitor (Denosumab) as a second-line pharmacologic treatment to reduce the risk of fractures in postmenopausal females diagnosed with primary osteoporosis who have contraindications to or experience adverse effects of bisphosphonates (conditional recommendation; moderate-certainty evidence).

Recommendation 2b: ACP suggests that clinicians use the



RANK ligand inhibitor (Denosumab) as a second-line pharmacologic treatment to reduce the risk of fractures in males diagnosed with primary osteoporosis who have contraindications to or experience adverse effects of bisphosphonates (conditional recommendation; low-certainty evidence).

Recommendation3: ACP suggests that clinicians use the sclerostin inhibitor (Romosozumab, moderate-certainty evidence) or recombinant PTH (teriparatide, low-certainty evidence), followed by a bisphosphonate, to reduce the risk of fracturesonly in females with primary osteoporosis with very high risk of fracture (conditional recommendation).

Recommendation 4: ACPsuggests that clinicians take an individualized approach regarding whether to start pharmacologic treatment with a bisphosphonate in females over the age of 65 with low bone mass (osteopenia) to reduce the risk of fractures (conditional recommendation; low-certainty evidence).

MANAGEMENT OF SECONDARY OSTEOPOROSIS

The treatment is directed at the underlying cause to eliminate its adverse effects on bone and mineral metabolism

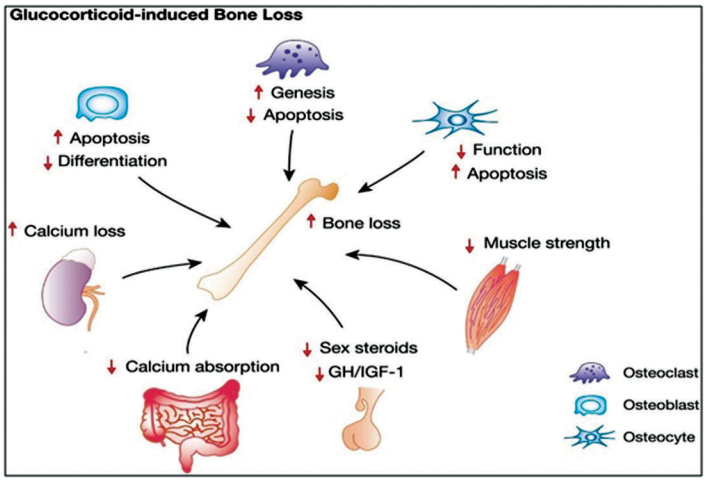
- o Adequate calcium and vitamin D supplementation.
- o Weight-bearingexercise/Smokingcessation/Avoidance of alcohol intake
- o Antiresorptive agents like bisphosphonates –are the first line.
- o Denosumab in patients with CKD/malignancies with bone metastasis
- o Anabolic agents (Teriparatide) are not the first-linedrugs- used in glucocorticoid-induced osteoporosis, severeosteoporosis, contraindications to bisphosphonates, and failure of other modalities of treatment
- o Romosozumab is not approved for treating secondary osteoporosis.

CUSHING SYNDROME/GLUCOCORTICOID-INDUCED OSTEOPOROSIS (GIO)

- o **It is the most common form of secondary osteoporosis**. Adverse effects are cumulative and dependent on dose, duration, and the underlying disease. Theestimated prevalence ~1.2% (NHANES)
- GIO has a predilection for cancellous bone (typically D6-7 Vertebral fracture)
- o **Clinical risk factors –**
  - a) Glucocorticoid dose (> 5mgdaily, or a lower dose in patients with other risk factors)
  - b) >3months of planned glucocorticoid therapy
  - c) Pre-existing fracture
  - d) Other osteoporosis risk factors including menopausal status

Bisphosphonates

- Bisphosphonates reduced the risk of vertebral fractures but evidence low for non-vertebral fractures
- Rx duration-as long as glucocorticoid therapy is prescribed.



Denosumab

3 randomized controlled rials (RCTs), denosumab was found to be superior to alendronate and risedronate in increasing BMD at the spine andhip

Teriparatide

- Teriparatide vs Alendronate in GIO (3yrs): Spine BMD improvement/incident vertebral fractures teriparatide superior. Non-vertebral fractures – Nodifference
- Denosumab vs Teriparatidein GIO (2yrs) patients with prior bisphosphonate Rx: Teriparatide increased lumbar spine and femoral neck BMD. Denosumab increased lumbarspine BMD only

PRIMARY HYPERPARATHYROIDISM (PHPT)

Generally, presents in individuals aged > 50years. Persistent hypercalcemia with an elevated or inappropriately normal parathyroid hormone (PTH). Clinical features -"Bones, stones, moans, and groans". Can be asymptomatic.

Treatment-

- Symptomatic PHPT-Surgery
- Asymptomatic patients – surgery if - age <50 years, serum calcium >1mg/dL above the upper limit, BMDT-score d" "2.5 at any site, fragility fracture, eGFR<60 mL/min, nephrocalcinosis, renal calculi, or high stone risk.

For patients with asymptomatic PHPT who do not meet guidelines/unable or unwilling to have surgery

- · **Monitoring** - (?upto 8 to 10 years) calcium + vitamin D supplement + annually biochemistry + BMD every 2-years
- · **Anti-resorptive treatment** – for those with T-scores ≥ -2.5 at the lumbarspine, hip,or one-third radius, or in the presence of fragility fractures. Alendronate has best evidence though other bisphosphonates also effective. Denosumab can be used in older women with PHPT. Cinacalcet decreases calcium levels but doesn't improve BMD.

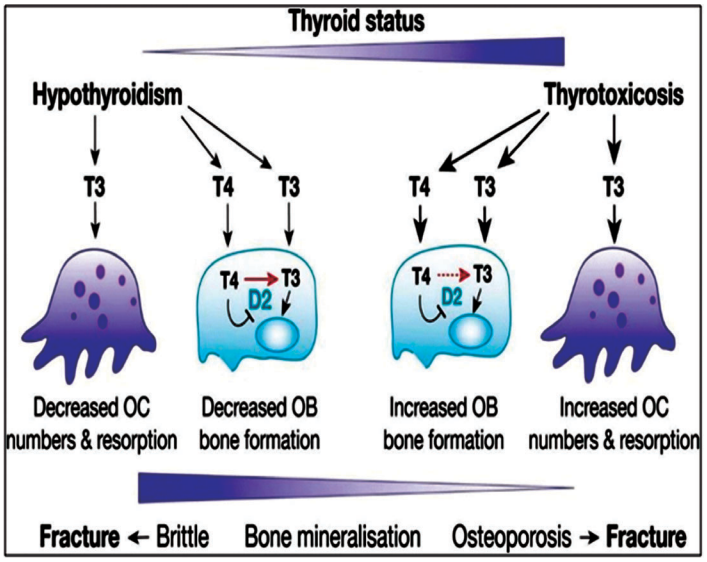


Figure- Thyroid disorder and osteoporosis

HYPERTHYROIDISM

Patients with untreated and sustained hyperthyroidism and subclinical hyperthyroidism / long term LT4 suppression Rx can have osteoporosis.

Hyperthyroidism increases the bone remodeling rate. Th normal bone remodeling cycle lasts 150 to 200 days. In the hyperthyroid state its duration is halved

Treatment - Significant, although incomplete, recovery of BMD with effective antithyroid treatment within the first 1 to 2 years after its initiation.

HYPOGONADISM (BOTH TESTOSTERONE AND ESTROGEN HAVE DIRECT AND INDIRECT EFFECT ON BONE HOMEOSTASIS)

Female - Prevalence of osteoporosis in Premature Ovarian Insufficiency (POI) 8%- 27%. In women with normal karyo type POI, identified risk factors for low BMI-

- Age <20 years at onset of irregular menses
- >1 year delay in diagnosis
- African, American or Asian ethnicity
- Low serum 25-hydroxy vitamin D concentrations
- Low dietary calcium
- Non adherence to estrogen therapy (ET)
- Lack of exercise

Treatment of osteoporosis in POI

- All guidelines agreed that ET (with added progestogen as appropriate) should be initiated and continued until at least the age of usual menopause.
- Higher estrogen dosages (2 mg oral or 100-150 mcg transdermal estradiol) are PROBABLY superior to lower oral estrogen dosages or the 30-mcg combined oral contraceptive for lumbar spine or femoral neck BMD
- Smaller studies with successful oral risedronate Rx and mixed results with addition of testosterone

Male Hypogonadism (MH)

Lack of Direct testosterone effects on androgen receptors on osteoblasts to promote trabecular bone formation and osteocyte signaling prevents trabecular bone resorption. Estrogen deficiency also contributes

Treatment- In young men with MH, androgen replacement therapy (ART) recommended to induce and maintain secondary sex characteristics and correct symptoms of testosterone deficiency

- ART prevents bone loss and ensures the achievement of physiological peak bone mass.
- Osteoporosis-specific therapies, such as bisphosphonates, denosumab,and anabolic agents, remain first-line therapy, regardless of comorbid MH. ART IS NOT approved therapy.

CONCLUSION

Secondary osteoporosis demands focused attention due to its varied causes and often silent progression. Unlike primary forms, it may affect younger patients and those with chronic illnesses, making diagnosis more complex. Management must address both the underlying condition and bone health directly, using targeted pharmacologic therapy and lifestyle changes. Bisphosphonates, denosumab, and hormone therapies play key roles, depending on patient profile. Routine screening in high-risk groups is crucial. By integrating comprehensive care strategies, clinicians can significantly reduce fracture risk and support long-term skeletal health in patients with secondary osteoporosis.

REFERENCES

1. 2022 American College of Rheumatology Guideline for the Prevention and Treatment of Glucocorticoid-Induced Osteoporosis.
2. Peter R Ebeling, Hanh H Nguyen, Jasna Aleksova, Amanda J Vincent, Phillip Wong, Frances Milat, Secondary Osteoporosis, Endocrine Reviews, Volume 43, Issue 2, April 2022, Pages 240–313, https://doi.org/10.1210/endrev/bnab028
3. Ganesan K, Jandu JS, Anastasopoulou C, et al. Secondary Osteoporosis. [Updated 2023 Mar 2]. In: StatPearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470166/

CALL FOR ARTICLES – THE INDIAN JOURNAL OF GERIATRIC CARE

The Editorial Board of The Indian Journal of Geriatric Care, the official publication of the Geriatric Society of India, invites submissions from its esteemed members and contributors for upcoming issues of the journal.

We welcome a wide range of scholarly contributions related to the field of geriatrics, including:

- *Original Research Articles*
- *Review Articles*
- *Case Reports*
- *Clinical and Policy Perspectives*
- *Articles of Historical Importance and Innovations in Geriatric Care.*

Articles from Nursing, Physiotherapy, Occupational therapy and other fields with subject matter in the field of Geriatrics and Gerontology will be considered.

This is an excellent opportunity to share your insights, research findings, and clinical experiences with a wide audience of professionals dedicated to improving the quality of life and healthcare for the elderly.

All submissions will undergo peer review to ensure the highest standards of academic integrity and relevance.

SUBMISSION GUIDELINES:

*Please refer to the author guidelines on our official website [**geriatricindia.in**] before submitting your manuscript.*

SUBMIT YOUR ARTICLES TO:

sajeshasokan@hotmail.com

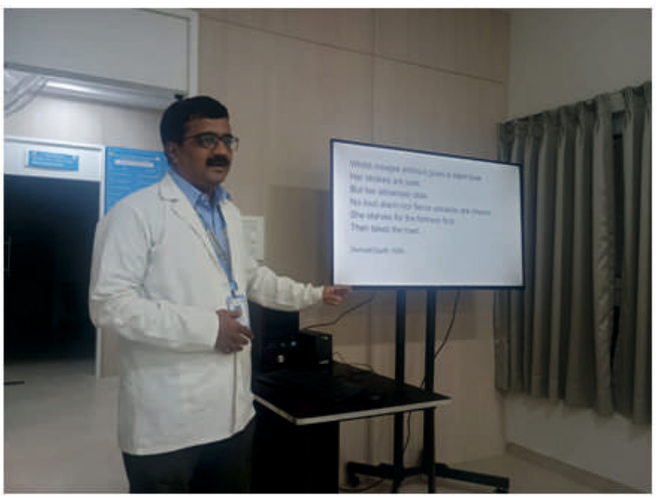
We look forward to your valuable contributions in advancing geriatric care and knowledge across India and beyond.

— Editorial Team
The Indian Journal of Geriatric Care
Geriatric Society of India

DISCOUNTED GSI MEMBERSHIP FEE FOR CANDIDATES APPLYING FOR CERTIFICATE COURSE VERSION V

NEWS FROM VIJAYAPURA

Addressing Tuberculosis in the Elderly: A Symposium Under the Leadership of Dr. Anand P. Ambali



On 24th March 2025, the Department of Geriatrics at Shri B. M. Patil Medical College, Hospital & Research Centre in Vijayapura, in collaboration with the Geriatric Society of India, hosted a pivotal symposium to commemorate World Tuberculosis Day. The event, titled "Symposium on Tuberculosis in Older Adults," gathered esteemed faculty and postgraduate students from the Departments of Geriatrics, Respiratory Medicine, and Microbiology.

The symposium commenced with a warm welcome from Dr. Anand P. Ambali, Professor and Head of the Department of Geriatrics. He emphasized the importance of addressing tuberculosis, particularly as it affects the elderly population, and set the stage for a series of informative presentations.

Dr. Karthik S., a postgraduate student in Geriatrics, initiated the proceedings with a presentation on the introduction and epidemiology of tuberculosis. This was followed by Dr. Kokilodayachandra T.C., who delved into the pathophysiology of the disease, highlighting the complexities involved in its manifestation among older adults.

Further presentations included Dr. Bhupathi Tabusum discussing the clinical features of tuberculosis and Dr. Ashok from the Department of Microbiology presenting on investigative methodologies employed in diagnosing the disease. Dr. Sagarika N. Suresh from Respiratory Medicine addressed the management strategies for tuberculosis, while Dr. Harini T. focused on preventive measures crucial for safeguarding the health of older adults.

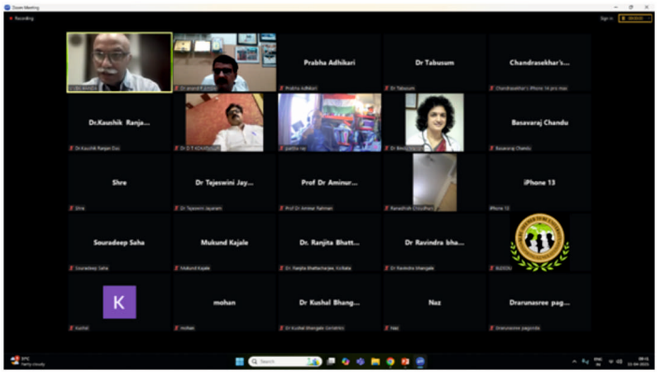
An interactive question-and-answer session, facilitated by Dr. Kushal Bhangale, encouraged robust discussion among participants, allowing for a deeper understanding of the challenges posed by tuberculosis in geriatric care. Dr. Aniruddha Umarji, Associate Professor in the Department of Geriatrics, shared his valuable experiences and insights on the topic.

The symposium concluded with Dr. Ambali's remarks, reinforcing the importance of continued education and awareness in combating tuberculosis, particularly within the ageing demographic. This event not only underscored the collaborative efforts of various departments but also highlighted the Geriatric Society of India's commitment to enhancing the health and well-being of older adults through knowledge dissemination and expert engagement

BLDE University Hosts National Symposium on Parkinson's Disease to Commemorate World Parkinson's Day

On April 11, 2025, the Department of Geriatrics at Shri B. M. Patil Medical College, Hospital & Research Centre in Vijayapura, in collaboration with the Geriatric Society of India, conducted an engaging online symposium to mark World Parkinson's Disease Day. The event, which commenced at 8:00 PM, brought together students and healthcare professionals from various backgrounds, including participants from Kenya, Bangladesh, and the United Kingdom.

The symposium opened with introductory remarks from Dr. Manisha Arora, Director of the Department of Medicine at C K Birla Hospital in Delhi, who highlighted the profound impact Parkinson's Disease has on individuals' lives. Following her address, Dr. PS Shankar, Professor Emeritus, provided a comprehensive overview of the historical background of Parkinson's Disease, setting the stage for further discussions.



Dr. Partha Ray, Honorary IMA National Professor in Neurology from Kolkata, elaborated on the clinical features associated with Parkinson's Disease, while Dr. Bindu Menon, Professor and Head of Neurology at Apollo Specialty Hospitals in Nellore, presented on the investigations and management strategies for the condition.

The symposium also featured Dr. Basavraj Chandu from the School of Physiotherapy at BLDE University, who discussed the critical role of physiotherapy in the management of Parkinson's patients. Additionally, Dr. Kaushik Ranjan Das, Coordinator of the GSI Caregiver Course, addressed the challenges faced by caregivers and offered practical solutions to enhance their support.

Concluding the event, Dr. Vivek Handa, Secretary of the Geriatric Society of India, provided insightful remarks. The session was expertly moderated by Dr. Tejaswini C. J. and Dr. V. G. Warad, while Dr. Anand P. Ambali, Professor and Head of Geriatrics at BLDE University and South Zone Coordinator for the GSI, coordinated the symposium and shared valuable snippets of information regarding Parkinson's Disease.

The symposium concluded with an interactive question-and-answer session, fostering meaningful discussions among participants. The event was a resounding success, attracting a total of 93 attendees, including healthcare professionals, postgraduate students, interns, and medical students.

Dr. Anand P. Ambali expressed gratitude for the enthusiastic participation and engagement, emphasizing the importance of continued education and collaboration in addressing the challenges posed by Parkinson's Disease.

This symposium not only highlighted the ongoing commitment of the Department of Geriatrics and the Geriatric Society of India to advancing knowledge and care in geriatric health but also underscored the significance of awareness initiatives in improving the quality of life for individuals affected by Parkinson's Disease.

BLDE University Launches New Course in Geriatric Pharmaceutical Care Practice

Vijayapura, April 21, 2025: BLDE (Deemed to be University), in collaboration with the Department of Geriatrics at Shri B. M. Patil Medical College and the Department of Pharmacy Practice at SSM College of Pharmacy & Research Centre, has officially launched a pioneering Value Added Course in Geriatric Pharmaceutical Care Practice (GPCP). This initiative, endorsed by the Geriatric Society of India, aims to elevate pharmaceutical care tailored to the unique healthcare needs of the elderly population.

The inauguration ceremony was attended by esteemed guests, including Chief Guest Dr. H. C. Sridhara Channakeshava Ranga Reddy, along with Guests of Honour Dr. O. P. Sharma and Dr. C. M. Setty. The event was presided over by Dr. R. B. Kotnal, Director of R&D at SSM College of Pharmacy.

In his welcome address, Dr. Anand Ambali, Professor and Head of the Department of Geriatrics at BLDE (DU), elaborated on the scope and challenges of gerontology within the current healthcare landscape. He emphasized the importance of such value-added programs in delivering patient-centered care for the elderly and celebrated the milestone achieved by his department as the first in the country to introduce this innovative integrated concept in geriatric care.

Dr. S. Z. Inamdar, Professor and Head of the Department of Pharmacy Practice, introduced the course as an integrated approach to delivering Geriatric Pharmaceutical Care. He highlighted how the collaboration of pharmacists within a multidisciplinary healthcare team can enhance medication safety, improve patient quality of life, and address the unmet needs of the elderly.

Chief Guest Dr. H. C. Sridhara Reddy commended the institute and the geriatric department for being the first in India to implement this integrated program across all medical and pharmacy colleges. He noted that this initiative aligns with key government initiatives aimed at improving healthcare for the geriatric population.

Dr. O. P. Sharma, Secretary General and a renowned geriatrician, praised the efforts of the BLDE Geriatric Department in launching the value-added program. He shared insights from his experiences, underscoring the positive treatment outcomes attributable to the vigilant actions of pharmacists and expressed optimism about the program's impact on geriatric care practices.

Dr. C. M. Setty, Principal of SSM College of Pharmacy, spoke on the significance of the program in developing pharmacy graduates'

skills to enhance elderly care through pharmaceutical products. He lauded the collaborative efforts of both departments in this innovative initiative.

In his presidential remarks, Dr. R. B. Kotnal summarized the speakers' insights and highlighted the program's value in achieving its objectives, particularly in the dynamic healthcare sector concerning elderly patients.

The event, held at the Medical Education Hall, showcased the university's commitment to advancing geriatric healthcare. A total of 23 interns have enrolled for the course, marking a significant step forward in preparing healthcare professionals to meet the growing demands of an ageing population.

The inaugural program concluded with a vote of thanks proposed by Dr. Sushil Kumar P. L., reinforcing the collaborative spirit of this groundbreaking initiative in geriatric pharmaceutical care.

Dr. Pradnya Diggikar Leads Successful World Health Day Event at Dr. D. Y. Patil Medical College

World Health Day was observed on April 7, 2025, at Dr. D. Y. Patil Medical College Hospital and Research Centre in Pune, under the guidance and initiative of Dr. Pradnya Diggikar, Professor in the Department of General Medicine. The event aimed to raise awareness about the significance of World Health Day, emphasizing this year's theme: "Healthy Beginnings, Hopeful Futures."

As part of the celebration, a free health camp was conducted, allowing patients and the general public to benefit from essential blood tests, including HbA1C and Thyroid function tests.

The event attracted several esteemed members of the medical fraternity, including Dr. Vijayashree Gokhale and Dr. Govind Shiddapur. Under Dr. Diggikar's mentorship, the event also witnessed enthusiastic participation from both undergraduate students and postgraduate residents, showcasing a strong commitment to community health and education.

This initiative not only highlighted the importance of health awareness but also fostered a spirit of collaboration among the medical community and future healthcare professionals.

ANNOUNCEMENTS

SAVE THE DATE
for the

National Annual Midterm Conference of Geriatric Society of India 2025 along with 1st Annual GSI Eastern Zonal and 2nd Annual GSI Odisha State Conference 2025.

20th– 22nd JUNE 2025

Hi-Tech Medical College and Hospital Bhubaneswar

We look forward to welcome you to the Temple City of Bhubaneswar.

Best regards

Dr. PC Dash	Dr. Santosh Swain	Dr. Mahesh Rath
Organizing Chairman	Scientific Chairman	Organizing Secretary

SCAN TO REGISTER:-

SCAN TO SUBMIT REGISTRATION LINK:

CLICK TO REGISTER :-
https://docs.google.com/forms/d/e/1FAIpQLSfRXukPtDfBTHZO1CVl7m6VpDya_cxo0jm_u-xjVLuKnTbo9A/viewform?usp=header

Certificate Course in
Geriatric Medicine & Gerontology
VERSION 5

Organized jointly by

GERIATRIC SOCIETY OF INDIA

&

KHAJA BANDANAWAZ UNIVERSITY

🗓 Duration :
4th July – 31st October 2025

🕗 Sessions :
Every Tuesday & Friday, 8:00 PM – 9:30 PM

🎤 Mode :
Zoom (Link sent every Monday)

📚 Eligibility :
MBBS/MD/MS/DNB/BDS/ Physiotherapists/Nurses

COURSE DETAILS

- Biweekly interactive Zoom sessions (1-2 lectures per class)
- Lecture summary PDFs & Vaccination Guidelines
- Post-lecture MCQs (by email)
- Assessment: 75% attendance + 50% pass mark
- Final Exam: ~10 days after last class (with supplementary)
- Course Fee: ₹13,000 (Inclusive of 18% GST)
- Includes: All Zoom lectures, PDFs, MCQs, assessment & certification
- Practical Training: At GSICON 2025, Agra (13th Dec) (Practical training fees, venue, dates will be informed in due course)
- Candidates will attend the practical training at his/her cost & are eligible for discounted rates at GSICON
- Certificates will be presented at Annual GSI Conference 2025, Agra

Bank Details :
Account Name:
Geriatric Society of India Kerala Branch
Bank: SBI
Valanjambalam
A/C No.: 43250344300
IFSC: SBIN0070898

Additional Benefits :
Discounted Life Membership: ₹6000 (₹8000 original)
Associate Life Membership: ₹3000 (₹4000 original)
📥 Forms:
www.geriatricindia.in

📝 Register Here:
https://forms.gle/dtbNURhQccQJZUTp8
Last date for registration : JUNE 30TH 2025

Best Wishes from GSI Kerala Branch

Contact :
Dr. Sajesh Asokan
9847031241
Course Editor
gsikeralabranch@gmail.com

Dr. Aswin Surjit
9446471672
Course Coordinator
surjitaswin@gmail.com

Dr. Balakrishnan Valliyot
9447320430
Course Conductor
valliyot@gmail.com

DELENG/2012/42798 Dt. 12 June 2012
Price Rs. 20 per copy

All Members are Requested to
Kindly update their
Email ID / Telephone No:
by sending mail to
secretariat office of GSI.