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Mortality trends among Indian Medical Association member doctors in India (2018-2023): Implications of the COVID-19 pandemic

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ABSTRACT

Objective: To analyze mortality trends among Indian Medical Association (IMA) member doctors in India from 2018 to 2023 and to assess the impact of the COVID-19 pandemic.

Methods: This was a cross-sectional study based on secondary data analysis of the doctors' mortality reported to and published by the IMA as a part of their National Social Security Scheme. Yearly membership details and death records of the member doctors from 2018 to 2023 were accessed from the published annual reports of IMA-National Social Security Scheme and analyzed.

Results: The number of deaths reported annually among IMA member doctors increased from 896 out of a total population of 15862 in 2018 to 1579 out of 16253 in 2023. The calculated death rate among member doctors was 56.5 per 1000 in 2018 and 97.1 per 1000 in 2023. The mean age at death among doctors during the COVID period (64.9±9.0) was significantly lower than that during pre-COVID (67.3±11.1) and post-COVID (66.1±8.5) periods.

Conclusions: This study shows a rising number of deaths and death rate among member doctors of IMA from 2018 to 2023. The average age at death during the study period ranged from 64 to 67 years, with a significant decline of approximately 2.4 years during the COVID-19 period.

KEYWORDS: Doctor death rate; Corona disease; Annual death rate; Pre-COVID; Post-COVID

1. Introduction

Health and mortality among doctors are of special interest, as the mortality reflects their health habits as well as lifestyle and to take care of their patients, doctors need to take care of themselves first. As healthcare providers, doctors are expected to live longer as they are more aware of healthy habits and risk factors and past studies from the United Kingdom, United States of America and Norway

Significance

This study provides valuable insights into mortality trends among doctors in India from 2018 to 2023, highlighting the impact of the COVID-19 pandemic. The findings emphasize the urgent need for targeted interventions aimed at improving infection control, occupational health, and well-being initiatives for health-care professionals. Enhancing the health and safety of doctors is essential not only for their personal well-being but also for the resilience of the healthcare system.

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confirmed that by reporting lower deaths among doctors compared to other occupational groups and the general population[1–4]. However, published news reports from Maharashtra and Kerala in India reported premature deaths among doctors compared to the general population, where the average age of death among doctors was reported to be 55-59 years and 61.7 years compared to 69-72 years, and 74.9 years respectively[5,6]. Heart disease (27%), and cancer (25%) were the commonest cause reported for doctors' deaths in India and suicide was identified as a major concern and cause of death among them. Long working hours, stress, lack of physical activity and regular health screening were identified as risk factors for such premature deaths among doctors[6,7].

The Coronavirus Disease 2019 (COVID-19) pandemic led to a significant impact on the physical and mental health of healthcare workers including doctors and was also associated with increased mortality among them especially before the vaccine rollout. According to estimates from the WHO, by May 2021, approximately 6% of global COVID-19 infections and 115 000 deaths were among healthcare workers[8,9]. The overall proportion of deaths due to COVID-19 among doctors in India was lower compared to other countries like Italy, Iran, Philippines, China, the United States of America and United Kingdom. However, as reported by the Indian Medical Association (IMA), there were 387 deaths due to COVID-19 reported among doctors in India by September 2020, with a much higher case fatality rate (16.7%) compared to that among the general population (1.7%) in the country[9,10]. Several aspects of healthcare roles like long and stressful working hours, exposures to biological infectious agents, ionizing radiation, toxic gases and chemicals are hazardous to health for doctors as well as other healthcare workers. Moreover, the COVID-19 pandemic had a significant detrimental impact on the physical and mental health of healthcare providers[9,2,11]. This study was conducted to find out the mortality trends among the IMA member doctors in India from 2018 to 2023 and to assess the impact of the COVID-19 pandemic on that.

2. Methods

This was a cross-sectional study based on secondary data analysis of the doctors' deaths reported to and published by the Indian Medical Association (IMA) as a part of their National Social Security Scheme (NSSS). IMA-NSSS is one of the social security schemes of IMA designed on a brotherhood fraternity basis that financially helps the family member (Nominee) in the event of the death of a member doctor[12]. Yearly membership details and death records of the member doctors from 2018 to 2023 were accessed from the published annual reports of IMA-NSSS, available on their website[13]. For comparison of mortality before, during and after the COVID-19 pandemic, the period was divided into pre-COVID period (2018-2019), COVID period (2020-2021) and post-COVID period (2022-2023), in line with the first wave of COVID-19 in India from March 2020 to January 2021 and second wave from March to April of 2021[14]. The annual death rate for doctors was calculated using the following formula:

$$\text{Annual death rate (\%)} = \frac{\text{Number of doctors' death in a year}}{\text{Number of member doctors in that year}} \times 1\,000$$

The data was analyzed into descriptive statistics and was presented in frequency, proportion and mean (SD) using bar charts and line charts to show trends of mortality. One-way ANOVA for summary value and *Chi*-square test for proportion was used to compare the age and age group at death among doctors during pre-COVID, COVID and post-COVID periods and a *P*-value of <0.05 was considered statistically significant.

3. Results

As shown in Figure 1, annual deaths reported among IMA member doctors rose from 896 to 1 579 from 2018 to 2023, while the total number increased from 15 862 to 16 253 from 2018 to 2023. The calculated death rate among member doctors was 56.5 per 1000 in 2018 and 97.1 per 1 000 in 2023, with an average death rate of 74.3% per 1 000 over the study period (2018-2023). The death rate among member doctors showed a rise of 72.0% from 2018 to 2023, with a progressive yearly rise of 7.4%, 9.6%, 15.2%, 15.7% and 9.7% in 2019, 2020, 2021, 2022 and 2023, respectively.

The mean age of death among member doctors ranged from 64 to 67 years from 2018 to 2023, which was significantly lower during the COVID period (64.7±9.0 in 2020 and 65.2±8.9 in 2021) compared to the pre-COVID period (67.0±13.5 in 2018 and 67.6±13.4 in 2019) and post-COVID period (66.0±8.5 in 2022 and 66.2±8.6 in 2023) (Table 1). More than two-thirds of the reported deaths during the study years were reported among doctors above 60 years of age, while only 0.1%-0.2% of deaths were reported among younger doctors below 30 years of age throughout the study period. A progressive rise was seen in the proportion of reported deaths among doctors above 60 years of age from 2018 (69.3%), 2019 (71.0%), 2020 (72.3%), 2021 (74.3%), 2022 (77.2%) and 2023 (78.0%) (Figure 2).

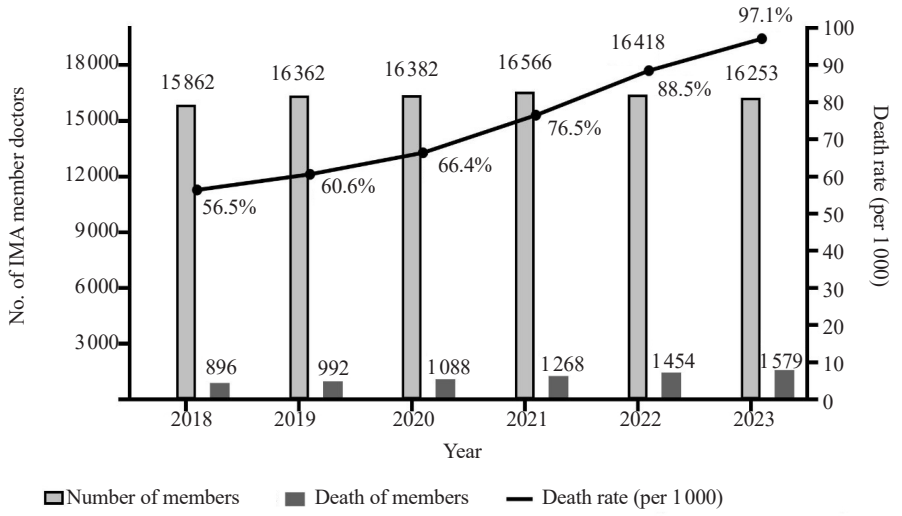

Figure 1. Annual statistics on the membership, mortality, and death rate of IMA member doctors (2018-2023).

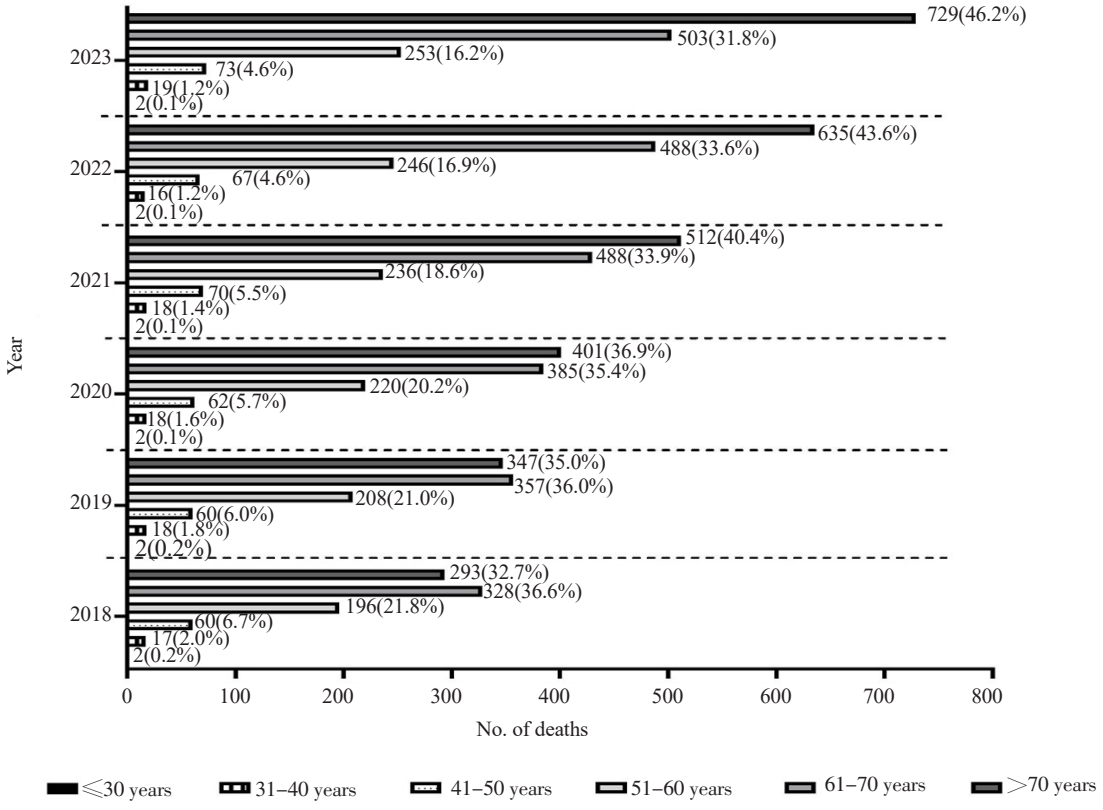

Figure 2. Age groups of IMA member doctors who died from 2018 to 2023.

While comparing the pre-COVID, COVID and post-COVID periods, the mean age of death among doctors during the COVID period (64.9±9.0) was significantly lower than the mean age of death during pre-COVID (67.3±11.1) and post-COVID (66.1±8.5) periods (P<0.01, using one-way ANOVA). During the COVID period, the mean age of death declined by 2.4 and 1.2 years compared to pre-COVID and post-COVID periods respectively(Table 2).

During the COVID-19 period, there was a notable increase in the number of deaths among member doctors aged 60 and older, with 73.3% reported compared to 70.2% in the pre-COVID period (P<0.01). This percentage rose further to 77.6% in the post-COVID period, which was significantly higher than the 73.3% observed during the COVID period (P<0.01)(Table 2).

Table 1. Mean age of the member doctors and the age of doctors at death (2018-2023).

Year	Number of members	Age of member doctors (Mean ± SD, years)	Age at death of member doctors (Mean ± SD, years)
2018	15 862	57.1 ± 2.8	67.0 ± 13.5
2019	16 362	44.5 ± 9.5	67.6 ± 13.4
2020	16 382	44.5 ± 9.5	64.7 ± 9.0
2021	16 566	44.5 ± 9.4	65.2 ± 8.9
2022	16 418	44.5 ± 9.4	66.0 ± 8.5
2023	16 253	44.4 ± 9.4	66.2 ± 8.6

Table 2. Comparison of age at death of member doctors during pre-COVID, COVID and post-COVID period.

Periods	Age groups		Total	Age at death of member doctors (Mean ± SD, years)
	⩽60 years	⩾ 60 years		
Pre-COVID (2018-2019)	563 (29.8%)	1 325 (70.2%)	1 888	67.3 (±11.1)
COVID (2020-2021)	628 (26.7%)	1 728 (73.3%)	2 356	64.9 (±9.0)
Post-COVID (2022-2023)	678 (22.4%)	2 355 (77.6%)	3 033	66.1 (±8.5)
P	<0.01*			<0.01**

Data were expressed by *n*(%); *significant using *Chi*-square test for proportion; **significant using one-way ANOVA for summary data.

4. Discussion

This study found a progressively rising number of deaths (896 to 1 579) as well as annual death rates (56.5/1 000 to 97.2/1 000) for IMA member doctors from 2018 to 2023. The annual increase in the number of deaths, as well as the mortality rate, was more pronounced in 2021, during the COVID-19 pandemic, with rates of 16.5% and 15.2%, respectively, in comparison to the pre- and post-COVID period. However, the majority of these higher deaths were reported among doctors above 60 years of age as shown in Figure 2. The average death rate over the study period was 74.3 per 1000-member doctors, which was much higher than the crude death rate in India of 8.9 per 1 000 in 2019-2021 as reported in the National Family Health Survey 5 (NFHS-5)[15]. However, the majority of doctors' deaths in this study were reported among elderly doctors (above 60 years) and this higher death rate (74.3/1 000) was comparable to the age-specific death rate of 78/1 000 for the elderly population (70 years and above) in the NFHS-5[15].

The mean age of death of member doctors ranged from 64 to 67 years over the study period (2018-2023), which was higher than those reported in the previous research conducted in Pune (55-59 years) and Kerala (61.7 years) and was comparable to the life expectancy at birth of 67 years in India as reported by World Bank in 2021[5,6,16]. In this study, the mean age of death was significantly lower during the COVID period with an average decline of 2.4 years in the COVID period (2020-2021) compared to the pre-COVID period (2018-2019), that was in line with the decline in life expectancy in India of an average of two years in 2020 compared to 2019 as reported in an Indian study by Yadav S *et al*. as well as with a reported decline of life expectancy of 1.8 years in 2021 compared to 2019 globally by Cao G *et al*.[17,18].

In this study, a majority (70.0%-80.0%) of doctors' deaths during the study period were among elderly members (above 60 years) and it showed a consistent rise from 2018 (69.3%) to 2023 (78%) that is consistent with the progressive rise in the life expectancy over a period time as reported by world bank until 2019[16].

This progressive rise in deaths among elderly members was also consistent during the COVID period, which can be due to a majority of COVID-19-related deaths being reported among individuals aged 60 years or above[19,20]. A study from Spain indicated that the rate of suicide among physicians is higher than that of the general population, with female physicians being at greater risk[21]. Though the current study did not focus on the suicide but future study needs to keep this in mind for further exploration.

This study was conducted for IMA member doctors whose deaths were reported under the IMA-NSSS scheme in annual report and do not represent the overall doctors in the country.

5. Conclusions

This study reveals a rising number in deaths and mortality rates among member doctors from 2018 to 2023, predominantly affecting those aged over 60 years (70.0%-80.0%). The average age at death during this period was 64 to 67 years, with a notable decline of 2.4 years during the COVID-19 pandemic. The analysis was conducted using secondary data with limitations, lacking important demographic and occupational variables that could influence health outcomes and mortality rates. Therefore, further research utilizing comprehensive methodologies is necessary to explore the factors affecting doctors' mortality in the country..

Conflict of interest statement

The authors claim there is no conflict of interest.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author upon request.

Authors' contributions

Jyotsana N and Pandit N conceptualize the study. Jyotsana N, Audichya H and Pandit Y contributed to the data collection and literature search. Trivedi A and Pandit N contributed to the first draft and all authors contributed in the finalization of the manuscript.

References

[1] Pandey S, Sharma V. Doctor, Heal Thyself: Addressing the shorter life expectancy of doctors in India. *Indian J Ophthalmol* 2019; **67**(7): 1248.

[2] Carpenter LM, Swerdlow AJ, Fear NT. Mortality of doctors in different specialties: Findings from a cohort of 20000 NHS hospital consultants. *Occupat Environment Med* 1997; **54**(6): 388-395.

[3] Aasland OG, Hem E, Haldorsen T, Ekeberg Ø. Mortality among Norwegian doctors 1960-2000. BMC Public Health 2011; **11**(1): 173.

[4] Frank E. Mortality rates and causes among U.S. physicians. *Am J Prevent Med* 2000; **19**(3): 155-159.

[5] Pune Times Mirror, Pune. *Doctors dies earlier than normal citizen: IMA study, 2018.* [Online] Available from: https://punemirror.com/pune/civic/doctor-dies-earlier-than-a-normal-citizen-ima-study/cid5133648.htm [Accessed on 10 March 2024].

[6] Times of India, Kochi. *Kerala doctors die earlier than general public: Study; 2017.* [Online] Available from: https://timesofindia.indiatimes.com/city/kochi/docs-die-early-than-gen-public-study/articleshow/61716443.cms. [Accessed on 10 March 2024].

[7] Pandey SK, Sharma V. Sudden and early death among medical professionals: How to reverse this trend? *Indian J Ophthalmol* 2023; **71**(5): 2286-2287.

[8] World Health Organization. *The impact of COVID–19 on health and care workers: A closer look at deaths.* [Online] Available at: https://iris.who.int/bitstream/handle/10665/345300/WHO-HWF-WorkingPaper-2021.1-eng.pdf?sequence=1. [Accessed on 10 March 2024].

[9] Iyengar KP, Ish P, Upadhyaya GK, Malhotra N, Vaishya R, Jain VK. Covid-19 and mortality in doctors. *Diabetes Metab Syndr* 2020; **14**(6): 1743-1746.

[10] Kapoor A, Kapoor KM. Covid-19 related deaths among doctors in India. *MedRxive* 2020. doi:10.1101/2020.09.28.20202796

[11] Guraya SS, Menezes P, Lawrence IN, Guraya SY, Rashid-Doubell F. Evaluating the impact of Covid-19 pandemic on the Physicians' Psychological Health: A systematic scoping review. *Front Med* 2023; **10**: 107153.

[12] Indian Medical Association (IMA). *About Us. IMA NSSS.* [Online] Available from: https://www.imansss.org/about-us/. [Accessed on 10 March 2024].

[13] Indian Medical Association (IMA). Publications. Available from: https://www.imansss.org/publications/ [Accessed on 10 March 2024].

[14] Tendulkar P, Pandey P, Panda PK, Bhadoria AS, Kulshreshtha P, Mishra M, et al. Comparative study between the first and second wave of covid-19 deaths in India: A single center study. *Cureus* 2023; **15**(4): e37472.

[15] International Institute of Population Science (IIPS) and ICF. *National Family Health Survey 5 (NFHS–5), 2019–2021: India: Volume 1.* Mumbai, IIPS. Available from: https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf. [Acceessed on 10 March 2024].

[16] The World Bank Data. *Life expectancy at birth, total (years) – India.* [Online] Available from: https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=IN[Accessed on 10 March 2024].

[17] Yadav S, Yadav PK, Yadav N. Impact of covid-19 on life expectancy at birth in India: A decomposition analysis. *BMC Public Health* 2021; **21**(1): 1906 doi:10.1186/s12889-021-11690-z

[18] Cao G, Liu J, Liu M, Liang W. Effects of the COVID-19 pandemic on life expectancy at birth at the Global, regional, and national levels: A joinpoint time-series analysis. *J Global Health* 2023; **13**: 06042.

[19] Harris E. Most Covid-19 deaths worldwide were among older people. *JAMA* 2023; **329**(9): 704.

[20] Wong MK, Brooks DJ, Ikejezie J, Gacic-Dobo M, Dumolard L, Nedelec Y, et al. Covid-19 mortality and progress toward vaccinating older adults — World Health Organization, worldwide, 2020–2022. *MMWR Morb Mortal Wkly Rep* 2023; **72**(5): 113-118.

[21] Irigoyen-Otiñano M, Castro-Herranz S, Romero-Agüit S, Mingote-Adán JC, Garrote-Díaz JM, Matas-Aguilera V, et al. Suicide among physicians: Major risk for women physicians. *Psychiatry Res* 2022; **310**: 114441.

[22] Shang TF, Chen PC, Wang JD. Disparities in mortality among doctors in Taiwan: A 17-year follow-up study of 37 545 doctors. *BMJ Open* 2012; **2**(1): e000382.

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