
Uptake of vitamin D supplements during the COVID-19 pandemic

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The Irish Longitudinal Study on Ageing (TILDA)

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Introduction

Vitamin D is an essential micronutrient and a hormone which is required, not just for bone and musculoskeletal health (particularly in older adults) to reduce the risk of falls, fracture and osteoporosis, but also for a host of other functions including immune responses. Recent evidence shows that insufficient or low vitamin D blood levels increase the risk of viral and bacterial infections. Some recent observational studies and randomised controlled trials have shown an association between vitamin D deficiency and the severity of COVID-19 symptoms. Even more recent studies suggest that vitamin D may also play a role in prevention of COVID as well as the severity of the response to COVID. It is therefore important to maintain a sufficient blood level of vitamin D. There are three sources of vitamin D: supplements, sunshine and diet. Unfortunately, at latitudes as northerly as Ireland, adequate vitamin D cannot be absorbed from sunshine from October to March while during summer months it can be affected by cloud cover, sunscreen use, pollution, age and obesity. In summer 2020, under advice to stay at home, many stayed indoors, further exaggerating poor exposure to sunlight when it was most needed. Additionally, the few foods that contain vitamin D (oily fish, liver, eggs) are not commonly consumed. Ireland does not have any mandatory vitamin D food fortification policy, so our food stuffs are lower than in countries with a fortification policy. Under these circumstances it is very unlikely that sufficient vitamin D, for the purposes of potentially protecting against COVID 19, can be obtained from foods. Therefore, the only reliable way to get enough of vitamin to have sufficient levels to mitigate the complications of COVID in Ireland, is through supplements.

Given the evidence that we as a research group in TILDA were aware of from our previous work, we embarked on a TILDA vitamin D awareness campaign to promote the intake of adequate doses of vitamin D via research reports, media engagement, original publications and review articles early on in the pandemic and have continued to feed emerging evidence to the scientific, policy and public communities as the science evolves. In the context of susceptibility to COVID-19, vitamin D blood levels of less than 50nmol/l are deficient and apply to 47% of 18-39 year olds, 60% of 50-59 year olds, 64% of over 80s, >90% in nursing homes, and up to 94% in dark-skinned Irish BAME communities (Laird and Kenny, 2020; Laird, Walsh, and Lanham-New, 2020; McCartney and Byrne, 2020; McCartney et al., 2020). It is also notable that risk factors which increase susceptibility to vitamin D deficiency are similar to those which increase susceptibility to COVID-19: obesity, older age, physical inactivity, cardiovascular disease, diabetes.

Method

This research brief is based on 3,614 Self-Completion Questionnaires completed by participants of The Irish Longitudinal Study on Ageing (TILDA). These participants consist of community-dwelling adults aged 60 years and older. Data was collected between June and October 2020.

Participants were asked if they had started taking vitamin D supplements since the beginning of the COVID-19 pandemic in March 2020. The data were compared with supplement use data from the previous wave.

The question was: *Since the outbreak of the COVID_19 pandemic, have you started taking.. Vitamin D ..health supplement?*

Results

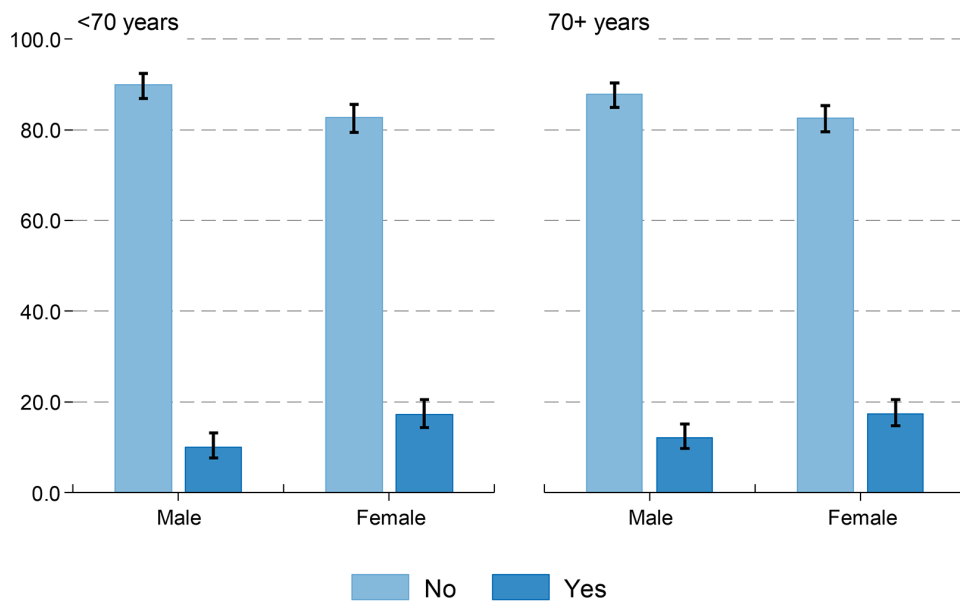
Almost one-in-seven (14.5%) adults aged 60 years and older began taking vitamin D supplements since march 2020. This is in addition to the 9% of TILDA participants who took supplements before the COVID-19 pandemic (Laird and Kenny, 2020)

Women (17.3%) were more likely than men (11.1%) to have started taking vitamin D supplements since the beginning of the COVID-19 pandemic in March 2020. Vitamin D supplement use was also higher in women prior to March- 15% of women and 4% of men and were taking vitamin D in the previous wave of data collection.

Older adults older or younger than 70 years were equally likely to have increased supplement use.

Figure 1 shows the percentage of older adults who began taking vitamin D supplements by gender and age. While there was no difference in terms of age, women in both age groups were more likely than men to have started taking vitamin D supplements.

Figure 1. Percentage of adults who began taking vitamin D supplements by gender and age group



As shown in Figure 2, older adults who had completed third level education were more likely to have started taking vitamin D supplements. The percentages within each education group were 12% among those with primary level education or less; 15% among those who completed their education at secondary level; and 20% among those who completed third level education.

Figure 2. Percentage of adults who began taking vitamin D supplements by education level

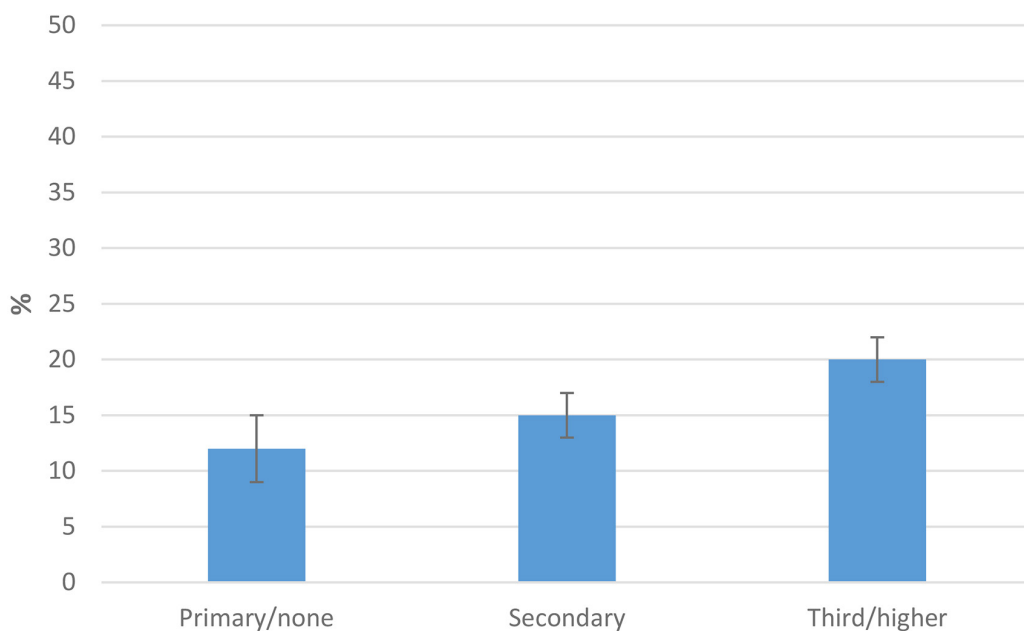
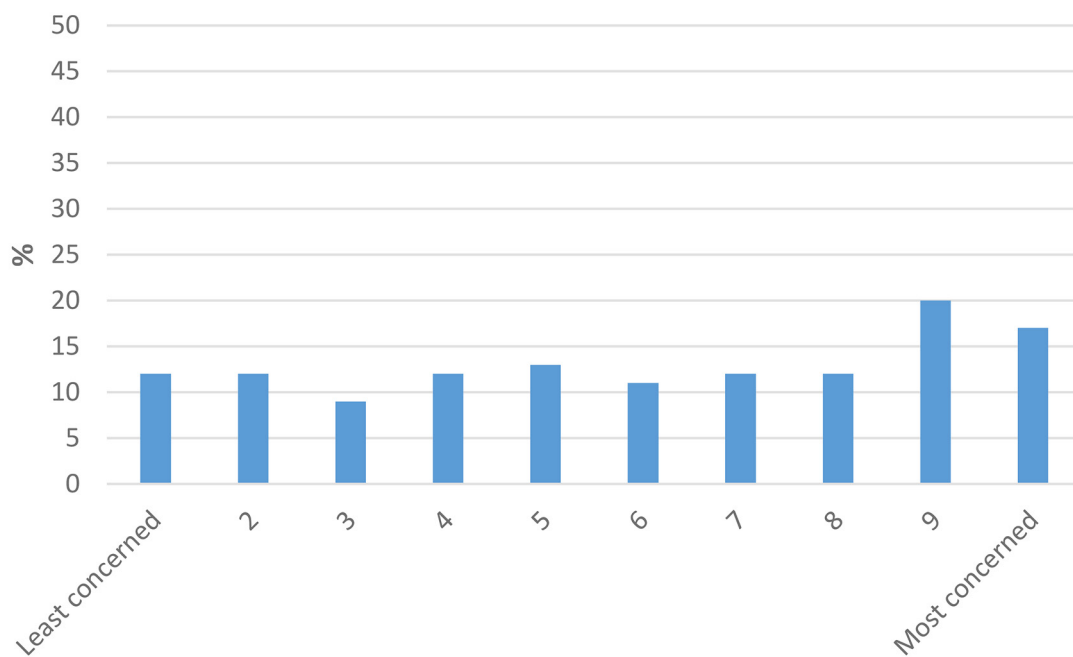


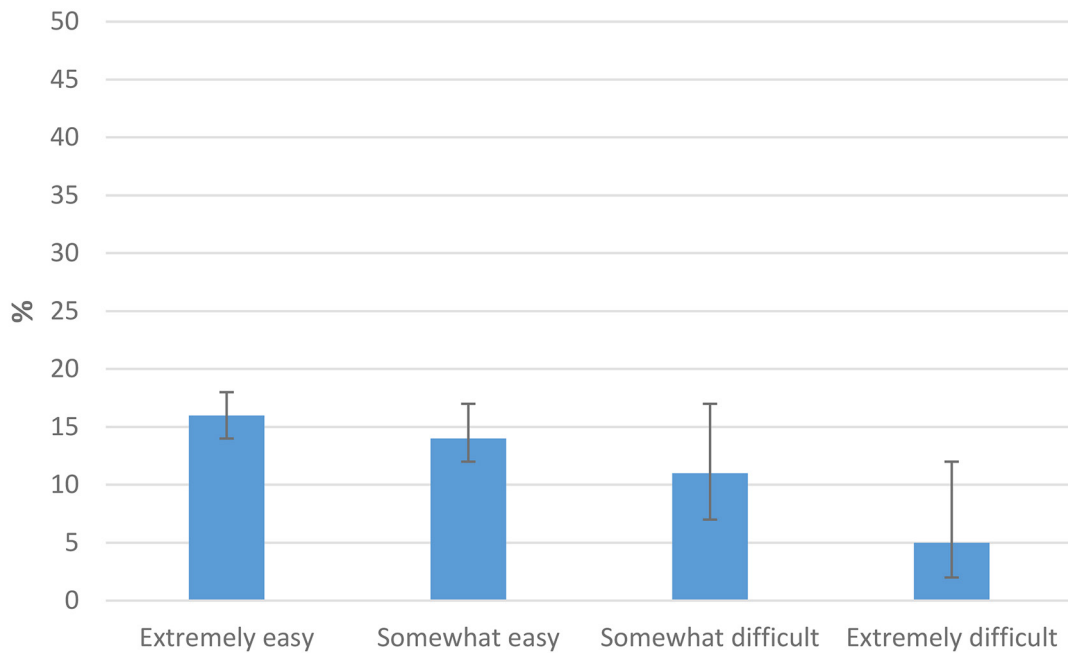
Figure 3 shows the percentage of older adults who began taking vitamin D supplements according to their level of concern about the COVID-19 pandemic. Concern about COVID-19 was measured on a 10-point scale with a score of one indicating the least concern and ten the most concern. While there was uptake of vitamin D supplements regardless of the level of concern expressed, a higher percentage in the most concerned groups did so.

Figure 3. Percentage of adults who began taking vitamin D supplements by their level of concern about COVID-19



Uptake of vitamin D supplements was also associated with the level of ease with which older adults understood government guidance on COVID-19. Sixteen percent of older adults who said they found government guidance extremely easy to understand had started taking vitamin D supplements compared to only 5% of those who found government guidance extremely difficult to follow.

Figure 4. Percentage of adults who began taking vitamin D supplements by ease of understanding of government guidance on COVID-19



Conclusion

It is now established that there may be a significant effect of deficiency of vitamin D (<50nmol/l) on both the likelihood of contracting COVID-19 and on the severity of response to COVID-19, including mortality. Before the pandemic 9% of older adults were taking vitamin D supplements. Since the beginning of the COVID-19 pandemic, 14.5% of adults aged 60 years and older have starting taking vitamin D supplements. Then as now, women are more likely to take a vitamin D supplement compared with men as are those with higher levels of education. Supplement is strongly dependant on the ease of understanding of government guidance on COVID-19 and by the level of concern about COVID-19. A clear and easily understandable public health message on the benefits of vitamin D for health (and potentially COVID-19) and the recommended intakes may have the potential to significantly increase vitamin D supplement use in older adults. The target dose for vitamin D supplementation in COVID 19 in Ireland should be higher than the recommendation from the Department of Health (DOH) or the Food and Safety authority (FSAI) which are pertinent to bone health but do not align with the evidence for COVID-19 protection.

Our conclusions and recommendations are :

1. There is now strong evidence that vitamin D can reduce the likelihood and severity of Covid-19 infection.
2. Vitamin D deficiency is common across all age groups in the Irish population, particularly older persons and those who have Covid-19 susceptibility risk factors.
3. The blood level of vitamin D required to enhance immunity against Covid-19 is 50nmol/l – this is higher than the level needed to improve bone health and current DOH and FSAI recommendation.
4. Skin exposure to sunlight is the major source of vitamin D; however, we do not get sufficient sunshine in Ireland to make enough vitamin D for enhanced immune function, especially during wintertime.
5. Dietary intakes of vitamin D are also low, meaning that the Irish adult population cannot achieve optimal vitamin D levels for immunity from food and sunshine alone.
6. Adults in Ireland therefore require vitamin D supplements containing 20-25 micrograms per day (800-1000 IU/day) to enhance their immunity against Covid-19.
7. For obese individuals, older adults and those with darker skin, supplementation at daily doses higher than 20-25 micrograms per day (800-1000 IU/day) will usually be required to meet the required blood levels.
8. Supplementation with doses up to 100 micrograms per day (4000 IU per day) is safe and does not cause side-effects.
9. Vitamin D supplements of 20-25 micrograms are cheap, safe, simple to take and widely available over the counter without prescription.
10. By developing vitamin D supplementation policy at the required dosage, there is a significant opportunity for Ireland to be the first country in the world to suppress the Covid-19 pandemic through optimisation of its population vitamin D levels.
11. A clear and easily understandable public health message on the benefits of vitamin D for health in COVID-19 is necessary.

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