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Predictors of vitamin D-containing supplement use in Australia and associations between dose and vitamin D status

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Societal and lifestyle changes mean that many Australians now lead predominantly indoor lifestyles, and nearly one in four adults are vitamin D deficient (25-hydroxyvitamin D (25(OH)D) <50 nmol/L)[1]. Since natural food sources of vitamin D are limited, with vitamin D present mostly in small amounts, supplementation is an alternative for increasing vitamin D status. However, very little is known about the prevalence and predictors of vitamin D-containing supplement use in Australia. The aims of this study were to describe the prevalence of vitamin D-containing supplement use in the Australian population, identify independent predictors of vitamin D-containing supplement use in adults, and investigate associations between supplemental vitamin D intake and serum 25(OH)D concentrations.

We used supplement intake data from a 24-hour dietary recall (n = 12,153; ages ⩾2 years) and serum 25(OH)D concentrations measured in adults (n = 7,751; ⩾18 years), collected as part of the 2011–2013 Australian Health Survey. Multiple regression models were used to investigate predictors (sex, age group, region of birth, State/Territory, season, education, socio-economic status, BMI category, physical activity, health condition, self-assessed health) of vitamin D-containing supplement use in adults, along with associations between dose and 25(OH)D concentrations/vitamin D sufficiency, adjusting for potential confounders.

The table shows the prevalence of vitamin D-containing supplement use by age group and type of supplement: overall vitamin D-containing supplement use was 10 %, 6 % and 19 % in children (2–11 y), adolescents (12–17 y) and adults (⩾18 y), respectively. Predictors of vitamin D-containing supplement use in adults included being female, advancing age, higher educational attainment, higher socio-economic status, and greater physical activity. After adjusting for potential confounders, a 1 μg increase in vitamin D intake from supplements was associated with an increase of 0·41 nmol/L in serum 25(OH)D concentrations (95 %CI 0·35, 0·47; $p < 0·001$), and vitamin D intake (μg) from supplements was positively associated with vitamin D sufficiency (25(OH)D ⩾50 nmol/L) (OR 1·08; 95 %CI 1·06, 1·11; $p < 0·001$).

	2–11 y *n* (%)	12–17 y *n* (%)	18–30 y *n* (%)	31–50 y *n* (%)	51–70 y *n* (%)	⩾71 y *n* (%)	⩾18 y *n* (%)
All types[1]	*176* (10)	*63* (6)	*224* (13)	*629* (18)	*624* (22)	*323* (25)	*1800* (19)
Single vitamin D	*1* (0·1)	*5* (1)	*26* (2)	*104* (3)	*218* (8)	*147* (12)	*495* (5)
Calcium[1]	*17* (1)	*6* (1)	*5* (0·3)	*67* (2)	*157* (5)	*72* (6)	*301* (3)
MVMM[1]	*155* (9)	*50* (5)	*179* (11)	*460* (13)	*300* (10)	*128* (10)	*1067* (11)
Fish oil[1]	*7* (0·4)	*7* (1)	*26* (2)	*50* (1)	*42* (1)	*15* (1)	*133* (1)
Fish liver oil[2]	*4* (0·2)	*0* (0)	*1* (0·1)	*10* (0·3)	*16* (1)	*16* (1)	*43* (1)

[1]With added vitamin D; [2]Inherent vitamin D with/without added vitamin D; MMVM, multivitamin/mineral

In summary, our results show that a 25 μg (1000 IU) dose of vitamin D (the daily dose in a single vitamin D supplement) equates to an average increase in 25(OH)D concentrations of 10 nmol/L in adults, and that adults who use a single vitamin D supplement are significantly more likely to be vitamin D sufficient than those who do not use a supplement. However, since only one in 20 adults reported taking a single vitamin D supplement, supplements are unlikely to make a major contribution to vitamin D status at a population level.

1. ABS (2014) Australian Health Survey: Biomedical results for nutrients. Canberra: ABS.