The Development and Validation of a Food Frequency Question-naire to Assess Dietary Vitamin D Intake in Pakistan Population

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Background:

- Vitamin D deficiency is a global epidemic, impacting over one billion people. South Asia, including Pakistan, is a hotspot with nearly 60% of its population affected. Nutrition is pivotal in health, and our study aimed to address this issue by creating and validating a dedicated dietary assessment tool.

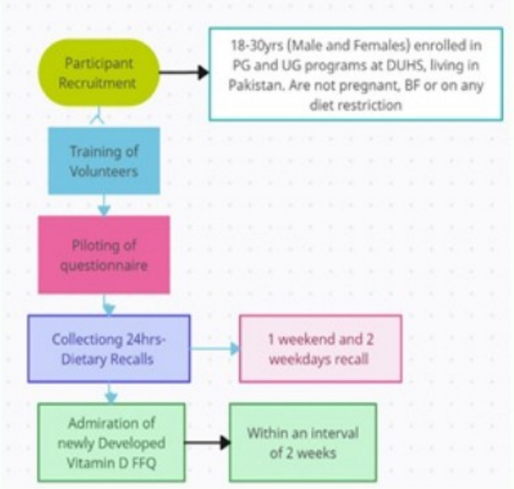
Aims and Objectives:

- Develop a vitamin D-specific FFQ, assess dietary vitamin D intake in young Pakistani adults, and
- evaluate agreement with 24-Hour dietary recalls.

Methods:

- Study Period: August- October 2023
- Participants: 99 students age 18-30 years, studying in undergraduate and postgraduate

programs at Dow University of Health Sciences, Karachi. Pakistan.



Data Analysis:

- **For Validity of questionnaire:** The assessment of the VD-FFQ involved an analysis of both its
- validity, compared with the results of a three 24HDR, and its reproducibility by comparing
- results obtained in two assessments (FFQ1 and FFQ2).
- **Analysis of 24HDR:** All 24-hour DRs were analyzed using the CRON-O-Meter, a web-based tool with an extensive worldwide food database, and serving sizes were established by referencing menu information or using standard unit values.
- **Analysis of VD content from food**: The average daily dietary intake of VD (µg) was calculated by dividing the total servings for items with weekly or monthly specifications by seven or thirty days, using the formula:
- **VD intake (µg)** = daily number of servings * typical VD content in one serving.

Statistical Analysis:

- **Software and Descriptive Statistics**: SPSS version 21.0.0 was used for analysis. Means and standard deviations described continuous variables, while frequency and percentage showed categorical data.
- **Correlation Analysis:** Spearman's rank correlation assessed the validity (FFQ vs. 24HDR) and reproducibility (FFQ1 vs. FFQ2), considering normality and using the mean of three 24HDR for all analyses.
- **RDA:** Results were compared to the recommended dietary allowance of 2.5 µg of VD according to PNDG

Category		Three 24hrs diet recalls	FFQ1	FFQ2
Mean ± SD (µg)		4.33 ± 2.74	5.96 ± 4.25	6.39 ± 4.4
Median (µg)		3.47	5.46	6.15
Minimum (µg)		0.70	0.01	0.07
Maximum		11.33	17.30	17.02
Percentage of individuals (characterized by intake of 2.5 µg)	Adequate intake (%)	68.7%	77.7%	76.8%
	Inadequate intake (%)	31.3%	28.3%	23.2%

Conclusion:

The newly developed FFQ questionnaire emerges as a crucial tool for evaluating VD intake in the

- Pakistani population. Given the absence of VD data in local food composition tables, this
- questionnaire stands as the sole feasible choice within the country. Impressively, the results
- affirm its validity and reproducibility among the 18-30 age group, marking a significant step
- forward. As we move ahead, extending its validation to diverse age groups promises to further
- elevate its impact on nutrition research in Pakistan.