

Knowledge, Attitude, and Practice of Cooking Oil Consumption Among Men and Women Aged 30-60 years in Urban Bengaluru

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Abstract

Background To assess the knowledge, attitude, and practices regarding cooking oil consumption among adults aged 30–60 years in urban Bengaluru, along with their sociodemographic details.

Methods This hospital-based cross-sectional study was conducted among 334 participants aged 30–60 years attending a tertiary care hospital in urban Bengaluru. Participants were selected using a convenience sampling technique. Data were collected between June 2024 and August 2024 using a pre-tested, semi-structured questionnaire administered through face-to-face interviews. Data on sociodemographic factors, types and quantities of oils used, and knowledge, attitude, and practices regarding cooking oil consumption were collected and analyzed using descriptive and analytical tests in SPSS version 24.

Results The majority of participants (n = 163, 49%) were between the ages of 51 and 60 years (age range: 30–60 years). The most widely used oils were sunflower oil (n = 227, 68%) and ghee (n = 205, 61%). More than half of the study participants (n = 192, 57%) used 500 mL to 1 L of oil per person per month, and 257 participants (77%) used 100–500 mL of butter or ghee per person per month. Only 48.5% (n = 162) of respondents read oil labels. Awareness of oil-related diseases was limited, with 40.4% (n = 135) recognizing heart disease as a risk. Health benefits, taste, and price were major influences on the choice of oil consumption.

Conclusion This study highlights that despite high educational and socioeconomic status, the consumption of refined oils, ghee, and butter remains prevalent among the study population. While most participants demonstrated a positive attitude toward healthy oils and reasonable awareness of cardiovascular risks, gaps persist in label-reading practices and comprehensive knowledge of the health consequences of excessive oil intake. These findings underscore the need for targeted nutrition education focusing on informed oil choices and practical dietary behavior change.

Keywords Dietary fats, Dietary patterns, Heart diseases, India, Plant oils, Urban population

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1 Introduction

Edible oils constitute a major component of adult diets worldwide, serving as a concentrated source of energy and essential fatty acids. Globally, per-capita consumption of vegetable oils varies widely, ranging from less than 10 kg per person per year in several low- and middle-income countries to more than 35–40 kg per year in many high-income nations, reflecting differences in dietary habits, urbanization, and economic development.^[1] Among adults, excessive and inappropriate oil consumption has important public health implications, particularly in relation to cardiovascular diseases (CVDs), which remain one of the leading causes of global mortality.^[2]

In India, dietary patterns among adults aged 30–60 years have undergone a substantial transition over the past two decades. National estimates indicate that per-capita annual edible oil consumption has nearly tripled, from approximately 8 kg in the early 2000s to about 23–24 kg in recent years, exceeding recommended dietary limits proposed by national and international health agencies.^[3,4] This increase has been particularly evident in middle-aged adults, driven by urbanization, sedentary lifestyles, increased disposable income, greater reliance on commercially prepared foods, and frequent consumption of fried foods. As a result, India has emerged as one of the world's largest consumers and importers of edible oils.^[5] The rising consumption of edible oils among adults aged 30–60 years is of particular concern, as this age group represents a critical period for the development of dyslipidemia, overweight and obesity, type 2 diabetes mellitus, and atherosclerotic heart disease (AHD).^[6] Although dietary fats are essential, both the quantity and quality of oils consumed during adulthood influence long-term cardiometabolic outcomes. Traditional Indian diets relied predominantly on region-specific fats such as mustard oil, ghee, and coconut oil; however, recent decades have witnessed a shift among urban adults toward refined seed oils such as sunflower, soybean, and safflower oils. Evidence suggests that while balanced intake of monounsaturated and polyunsaturated fatty acids may confer metabolic benefits, excessive intake or exclusive use of certain refined oils, particularly for high-temperature cooking, may adversely affect lipid profiles and oxidative stability.^[7–9]

Despite the increased availability of refined oils, unrefined or traditionally processed vegetable oils continue to be widely consumed by adults aged 30–60 years, who are typically responsible for household food purchasing and meal preparation. This preference is influenced by cultural and culinary traditions, as certain oils are closely associated with regional cooking practices and taste preferences. Unrefined oils are also commonly perceived as healthier due to minimal processing, presumed

retention of natural antioxidants, and the belief that they are more "natural." Additionally, limited availability of cold-pressed refined oils in local markets, rising prices, and economic constraints may prompt households to continue using familiar traditional oils.^[10,11] These factors collectively shape oil consumption behavior and highlight the importance of examining adult awareness and perceptions alongside actual consumption patterns.

At the regional level, urban centers such as Bengaluru reflect broader national trends while exhibiting distinct socioeconomic influences on dietary behavior. Among adults aged 30–60 years in Karnataka, cooking oil choice is shaped by health awareness, affordability, perceived quality, and entrenched cultural preferences. Recent increases in edible oil prices have further influenced household purchasing decisions, often resulting in the substitution or downgrading of oil types.^[11,12]

Dyslipidemia, identified by the National Cholesterol Education Program as a major modifiable risk factor for coronary heart disease, is closely linked to excessive and inappropriate oil consumption during adulthood.

^[13] Dietary behaviors established in the 30–60-year age group, particularly frequent consumption of fried foods, substantially increase the risk of CVD and type 2 diabetes later in life. Systematic reviews have demonstrated associations between frequent frying practices and increased risk of chronic diseases.^[9] Despite the growing burden of non-communicable diseases, there is a paucity of recent household-level data focusing specifically on edible oil consumption patterns, awareness, and determinants among adults aged 30–60 years in urban Bengaluru. Therefore, the present study was conducted among adults in this age group in urban Bengaluru, Karnataka, with the following objectives:

1. To assess the knowledge about cooking oils among the study subjects.
2. To assess the attitude about cooking oils among the study subjects.
3. To assess the practices of cooking oil consumption among the study subjects.

2 Methods

This hospital-based cross-sectional study was conducted among 334 participants aged 30–60 years attending a tertiary care hospital in urban Bengaluru. Participants were selected using a convenience sampling technique. Data were collected between June 2024 and August 2024 using a pre-tested, semi-structured questionnaire administered through face-to-face interviews.

The questionnaire was designed to assess household cooking oil consumption, awareness, attitudes, and practices related to heart health among adults aged 30–60 years. It consisted of four main sections.

The first section collected sociodemographic information such as age, gender, income, education, marital status, presence of medical conditions, and family size. This helped understand how background factors influenced cooking oil choices.

The second section evaluated knowledge and awareness about heart-healthy oils, healthy cooking methods, the importance of oil selection, and label-reading habits.

The third section focused on consumption patterns and practices, including the type and quantity of oil used, factors influencing oil selection (taste, price, health benefits, etc.), frequency of junk food consumption, and reuse of cooking oil.

The fourth section assessed attitudes and social influences, including sources of information about healthy oils, the influence of peers, the use of ghee or butter, and the willingness to adopt healthier cooking practices.

Overall, the questionnaire aimed to understand how demographic, behavioral, economic, and awareness factors influenced cooking oil consumption and heart-health-related choices in households.

Sample size

The sample size was calculated using the prevalence (p) of cardiovascular disease (31.8%) among adults in a study conducted by Kalra et al. in India.^[14]

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where n = sample size

Z = Z statistic for level of confidence

P = expected prevalence (P = 0.31)

d = precision, considering this as 5%.

Using the above formula and substituting the values, the total sample size was calculated to be 334.

Inclusion criteria

Men and women aged 30–60 years residing in urban Bengaluru who provided written informed consent to participate in the study.

Exclusion criteria

Individuals who did not provide consent for participation in the study, individuals with acute severe illness at the time of data collection, and individuals with chronic debilitating conditions or serious medical illnesses that could significantly alter dietary practices (e.g., advanced cardiac, renal, or hepatic disease)

Method of collection of data

The patients and their attenders visiting the tertiary care hospital of Urban Bengaluru between June 2024 and August 2024 were enlisted.

The study subjects were selected using a convenient sampling technique and enrolled in the study after obtaining informed consent.



A pretested, semi-structured questionnaire was used to assess knowledge, attitude, and practice of cooking oil consumption among the study subjects by the personal interview method by the principal investigator, who is working as an intern at a teaching hospital in Urban Bengaluru.

The questionnaire was validated through a pilot study and statistical testing. (Cronbach's alpha was found to be 0.71)

3 Results

A total of 334 adults aged 30–60 years participated in the study. Nearly half of the participants (49.7%) belonged to the 51–60-year age group, with males constituting 56% of the study population. The majority of respondents were married (85.6%) and belonged to the upper socioeconomic class (81.1%), and more than half had attained professional or postgraduate education (55.7%), as shown in Table 1.

Table 1 Sociodemographic details of the study subjects

Gender	Number (percent%)
Male	187 (56%)
Female	147 (44%)
Age	Number (percent%)
30-40	99 (29.6%)
41-50	69 (20.7%)
51-60	166 (49.7%)
Socioeconomic status according to the modified Kuppuswamy classification	Number (percent%)
Upper class	271 (81.1%)
Upper middle class	31 (9.3%)
Middle class	12 (3.6%)
Lower middle class	13 (3.9%)
Lower class	7 (2.1%)
Education	Number (percent%)
Professional degree/post-graduate	186 (55.7%)
Graduate	101 (30.2%)
Intermediate/diploma	22 (6.6%)
High school	18 (5.4%)
Middle school	1 (0.3%)
Primary school	3 (0.9%)
Illiterate	3 (0.9%)

Sunflower oil (68%) and ghee (61.4%) were the most commonly used fats. Most participants (82.6%) reported using one or two types of oils regularly, while only 17.4% used three or more types. Monthly consumption of cooking oil per person was predominantly between 500 ml and 1 L (57.5%). A large proportion of respondents (81.7%) reported regular use of ghee or butter, with the majority consuming 100–500 ml per month, as shown in Table 2.

Table 2 Cooking oil consumption practice among the study subjects

Type of oil	Number (%)
Sunflower oil	227 (68%)
Olive oil	43 (12.9%)
Mustard oil	23 (6.9%)
Ghee	205 (61.4%)
Butter	80 (24%)
Groundnut oil	159 (47.6%)
Coconut oil	80 (24%)
Vanaspathi	1 (0.3%)
Others (gingelly oil, rice bran oil, kusube oil, sesame oil, etc.)	19 (5.7%)
Monthly Cooking Oil Consumption per person	Number (percentage %)
≤ 250ml	39 (11.7%)
250-500ml	66 (19.8%)
500ml-1000ml	192 (57.5%)
> 1000ml	37 (11%)
Type of oil used	Number (percentage %)
Cold-pressed oils	88 (26.3%)
Refined oils	264 (79%)
Wood-pressed oils	29 (8.7%)
Regular use of ghee and butter	Number (percentage %)
Yes	273 (81.7%)
No	61 (18.3%)
Monthly ghee/butter consumption per person	Number (percentage %)
≤ 100ml	57 (20.8%)
100-250ml	121 (44.2%)
250-500ml	90 (32.8%)
> 500ml	6 (2.2%)

Label-reading behaviour was suboptimal, with only 48.5% of participants consistently reading cooking oil labels. Knowledge regarding health risks associated with excessive oil consumption was limited. 40.4% identified heart disease as a consequence, followed by hypercholesterolaemia (29.3%) and obesity (13.5%), as shown in Table 3.

Table 3 Assessment of knowledge of health problems caused by excessive oil consumption (n = 334)

Health problems	Number (percentage %)
Hypercholesterolemia	98 (29.3%)
Heart problems	135 (40.4%)
Diabetes mellitus	14 (4.2%)
Hypertension	28 (8.4%)
Allergy/skin rashes	52 (15.6%)
Obesity	45 (13.5%)
Cancer	8 (2.4%)
Respiratory problems	9 (2.7%)
GI disturbances	31 (9.3%)
Don't know	37 (11.1%)
Others*	17 (5.1%)

*Others: kidney problems, fever; thyroid problems; stroke; poisoning

A vast majority (84.1%) of respondents expressed a positive attitude, either agreeing or strongly agreeing that healthy oils are important in the diet. 13.2% remained neutral, which may reflect a lack of awareness or indecision regarding what qualifies as "healthy oils". The data reveal that participants obtained information about cooking oils from a variety of sources, both formal and informal, as depicted in Figure 1.

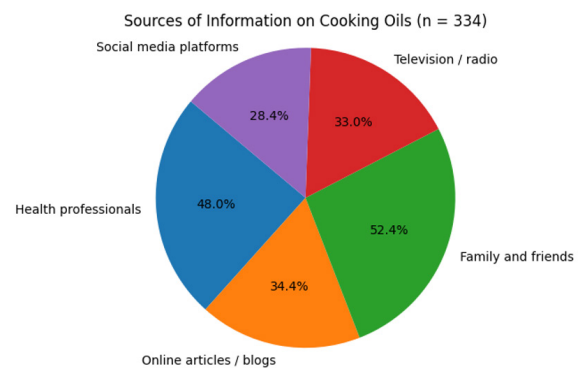


Figure 1 Pie chart showing different sources of information used by study subjects on cooking oils

The majority of participants reported consuming junk food once a week (33.2%), followed by those who consumed it twice a week (24.2%). A smaller percentage consumed junk food three times a week (6.6%), while only 3.9% reported consuming it four or more times per week.

Less frequent consumption was also observed: 8.1% consumed junk food once every two weeks, 5.7% once a month, and 1.8% once every three months. Notably, 16.5% of respondents reported consuming junk food very rarely.

Overall, the findings indicate that while a majority of respondents consume junk food at least once a week, frequent consumption (three or more times per week) is relatively low.

While males appeared slightly more open to changing oil preferences than females, the difference was not statistically significant ($p > 0.05$). Similarly, although higher socioeconomic groups consumed a greater variety of premium oils such as ghee and groundnut oil, the association between socioeconomic status (SES) and oil type was not statistically significant ($p = 0.0707$). However, the cost of oil showed a significant association with SES.

There were no significant links between comorbidities and oil preferences. Education level also did not significantly impact oil choice, though postgraduates showed more diverse usage.

Health benefits (34.8%), taste (24.4%), and cost (18.9%) emerged as the primary factors influencing oil selection. This relationship was highly significant ($p = 0.000$). Sunflower oil and ghee remained the most popular, with groundnut and coconut oils gaining preference when health was prioritized.

Gender significantly influenced perceived health risks of oil consumption, males linked it to a broader range of diseases, while females associated it more with allergies and skin conditions. A significant relationship was also observed between the belief in healthy oils and the type of oil used ($p = 0.0001$), as shown in Table 4.

4 Discussion

The present study assessed the knowledge, attitude, and practices related to cooking oil consumption among adults aged 30–60 years in urban Bengaluru. This age group is particularly important, as dietary behaviors established during midlife significantly influence the development of non-communicable diseases such as cardiovascular disease and type 2 diabetes mellitus. The findings reveal a coexistence of relatively positive attitudes toward healthy oils alongside suboptimal knowledge and inconsistent dietary practices.

In the current study, sunflower oil (68%) and ghee (61.4%) were the most commonly consumed fats. This pattern differs from findings reported by Rawat and Chaudhary and Chhajer et al., where mustard oil was the predominant choice, reflecting strong regional dietary preferences in North India.^[15,16] The preference for sunflower oil in the present study may be attributed to urban availability, widespread marketing as a "heart-friendly" oil, and perceived affordability. The low use of vanaspathi observed in this study is consistent with other Indian studies and likely reflects increasing public awareness regarding the harmful effects of trans fats.^[16]

Regular consumption of ghee and butter was reported by a substantial majority (81.7%) of participants. Similar findings have been documented by Sharma et al. and Kataria et al., who observed continued use of ghee in Indian households despite evolving dietary guidelines.^[17,18] While excessive saturated fat intake is traditionally discouraged, emerging evidence suggests that moderate ghee consumption may not be as deleterious as previously assumed and may even confer certain metabolic benefits when consumed within recommended limits. This may explain the persistence of ghee usage despite increasing health awareness.^[5]

Most participants reported monthly oil consumption of 500 mL to 1000 mL, which is comparable to findings from Salehzadeh et al. in Iran, where average household consumption was approximately 1.2 L per month.^[19] This suggests that oil intake quantity in urban Bengaluru is similar to that reported in other middle-income urban settings. However, considering the frequent use of ghee and refined oils, the cumulative intake of saturated and total fats may still exceed recommended dietary limits.

Only 48.5% of participants reported regularly reading cooking oil labels. Although this proportion is higher than that reported by Rawat and Chaudhary, where the majority did not read labels, it remains suboptimal given the high educational and socioeconomic profile of the study population.^[15] This highlights a gap between general literacy and functional nutrition literacy, underscoring the need for clearer food labeling and consumer education.

Knowledge regarding the health risks of excessive oil consumption was limited, with less than half identifying cardiovascular disease as a consequence. This finding is discordant with studies reporting higher awareness levels, particularly in urban populations.⁸ The limited recognition of links with diabetes, obesity, and hypertension suggests a fragmented understanding of diet-related chronic disease pathways. Such gaps may contribute to continued unhealthy practices despite positive attitudes.

Health benefits emerged as the most influential factor in oil selection, followed by taste and cost, a finding consistent with studies by Biswas et al. and Manchanda and Passi.^[20,21] However, the continued preference for refined oils and the frequent reuse of heated oils observed in nearly one-third of participants indicate that awareness does not consistently translate into practice. Repeated heating of oils is known to generate toxic compounds and increase cardiovascular risk, as highlighted by Manchanda and Passi, making this a key area for intervention.^[21]

The study also revealed that informal sources such as family, friends, and media exerted greater influence on oil-related information than health care professionals. Similar trends have been observed in other Indian studies, emphasizing the growing role of social media and peer networks in shaping dietary behaviors.^[22] This

Table 4 Association between socio-demographic variables, attitude, and cooking oil consumption practice among study subjects

Willingness to change the type of oil used									
	Yes	No	Maybe	Chi-square value:	P-value:				
Male	119	7	61	4.42	0.11				
Female	77	6	64						
Socioeconomic status and type of oil used									
	Sunflower	Ghee	Groundnut	Coconut	Oth-ers	Chi-square value:	P-value:		
Lower class	5	1	2	0	1	24.95	0.07		
Lower middle class	9	4	3	2	1				
Middle class	8	4	7	1	2				
Upper middle class	24	13	12	5	5				
Upper class	181	183	135	72	154				
Influence of the cost of cooking oil and socio-economic status									
Cost of the cooking oil used.	Lower class	Lower middle class	Middle class	Upper mid-dle class	Upper class	Chi-square value:	P-value:		
Cost is a significant factor	0	0	4	4	18	15.14	0.05		
Considers cost as well as health	5	10	5	19	168				
I prioritize Health	2	3	3	8	85				
Comorbidities and the type of oil used									
Comorbidities	Sunflower	Ghee	Groundnut	Coconut	Oth-ers	Chi-square value:	P-value:		
Diabetes	27	27	29	12	21	12.45	0.71		
Hypertension	35	38	31	18	26				
Hypothyroidism	9	7	5	1	6				
Heart problems	5	4	3	2	4				
Others (obesity, kidney problems, rheumatoid arthritis, CVT, hyperlipidaemia, hormonal imbalance)	5	5	2	2	10				
Weekly junk food consumption and comorbidities present									
Frequency of junk food consumption.	No comor-bidities	Diabetes	Hyper-tension	Hypothy-roidism	Obesity	Heart problems	Others	Chi-square value:	P-value:
Once a week	81	14	17	6	1	2	2	57.30	0.058
Twice a week	62	7	12	1	0	2	1		
Thrice a week	14	2	5	3	0	0	0		
Four or more times a week	11	1	1	0	0	0	0		
Once in 2 weeks	15	5	7	0	1	0	2		
Once in a month	15	3	2	0	0	0	0		
Once in 3 months	4	1	0	0	0	1	0		
Gender and perceived health risks of excessive oil consumption									
Gender	Hypercho-lesterolemia	Heart problems	Don't know	Hyperten-sion	Allergy/skin rashes	Obesity	Others	Chi-Square value:	P-value:
Male	59	84	22	21	15	29	44	24.64	0.0004
Female	39	51	15	7	37	16	24		

underscores the importance of disseminating accurate, evidence-based nutrition information through widely accessed platforms.

Overall, the findings indicate a clear knowledge–practice gap among urban adults aged 30–60 years. While attitudes toward healthy oils are largely positive, incomplete knowledge, cultural preferences, economic considerations, and misinformation contribute to suboptimal practices. Targeted nutrition education, improved food labeling, and culturally appropriate public health messaging are essential to promote healthier cooking oil choices and reduce the burden of diet-related non-communicable diseases.

5 Conclusion

This study highlights important patterns in knowledge, attitudes, and practices related to cooking oil consumption among adults aged 30–60 years in urban Bengaluru. Although most participants demonstrated a positive attitude toward healthy oils and moderate awareness of cardiovascular risks, notable gaps persist in comprehensive knowledge, label-reading behavior, and the adoption of optimal cooking practices. The continued predominance of refined oils alongside substantial consumption of ghee and butter reflects a coexistence of dietary transition and traditional food habits, influenced by health perceptions, taste preferences, cost, and cultural familiarity.

The cross-sectional design and reliance on self-reported data limit causal interpretation and may introduce recall bias, while the predominantly urban and higher socioeconomic profile of participants restricts generalizability. Future research should incorporate longitudinal and interventional designs to evaluate the impact of improved oil-related knowledge on dietary behavior and cardiometabolic outcomes. Qualitative exploration of cultural beliefs and targeted nutrition education focusing on oil selection, label interpretation, and safe cooking practices are warranted. Strengthening consumer awareness and policy-level support may contribute to healthier dietary fat consumption and long-term cardiovascular disease prevention.

Declarations

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Artificial Intelligence Disclosure

During the preparation of this work, the authors used ChatGPT-4.0 to edit the text for clarity and describing certain

information. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Authors' Contributions

Akhila Shashidhara contributed to data collection, compilation, analysis of the data, and manuscript writing. Manasa Avverahally Ravi conceptualized the data and also handled data collection, compilation, analysis of the data, and manuscript writing. Chandrakala Channaveeradevaru contributed to data analysis and compilation.

Availability of Data and Materials

Data were collected by convenient sampling technique and are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors confirm that they have no conflict of interest.

Consent for Publication

Not applicable.

Ethical Considerations

As per the IEC meeting at RRMCH held on 22.03.2024, the committee has gone through the study material submitted for the research protocol 'Knowledge, attitude and practice of cooking oil consumption among adults in urban localities of Bengaluru'. After detailed deliberations, the committee accords its approval for this research under the Code of Ethics RRMCH-IEC/115/2024.

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