International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 18s, 2025
https://theaspd.com/index.php

Reasons And Solutions For Poor Adherence To Diet And Physical Activity Among Patients With Chronic Non-Communicable Diseases: A Mixed Methods Study In Karaikal.

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Abstract

Background

Diet and physical activity play a pivotal role in preventing as well as containing the severity and complications of Non-Communicable Diseases (NCDs). But, previous literature found that the adherence to diet and physical activity among NCD patients were unsatisfactory. Hence, this study was planned to determine the reasons for poor adherence to diet and physical activity among patients with chronic NCDs and to prioritize the key action points to improve the adherence to diet and physical activity.

Methodology

A mixed-methods study was conducted in NCD Clinics in Primary Health Centres (PHCs) in Karaikal for six months. In quantitative phase, 250 NCD patients were surveyed using a pre-tested and semi-structured questionnaire and in qualitative phase, 20 PHC staffs and stakeholders were selected purposively for Focus Group Discussion (FGD) and Key Informant Interviews (KII). Quantitative data was analysed in SPSS 26 software for Multivariate Logistic Regression and Thematic Content Analysis was employed for qualitative data using Atlas.ti 9 software.

Results

Lack of awareness (74%), cost and availability of healthy food (66%), taste of food (62%), work stress (53%) and lack of self-motivation (40%) were the prime reasons for poor adherence to diet and physical activity. As recommended by the key persons, proper doctor-patient communication, feedback and problem solving and production of low-cost healthy foods would improve the adherence to diet and physical activity.

Conclusion

The findings of this study would help in planning context-specific behaviour change communication strategies and in designing culturally-sensitive and socially-acceptable intervention programmes for NCD patients.

Keywords: *diet, physical activity, adherence, non-communicable diseases, mixed-methods study, primary healthcare centres*

INTRODUCTION

Non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular disorders are among the leading causes of morbidity and mortality globally. Effective management of these chronic conditions hinges significantly on sustained lifestyle modifications, particularly adherence to a balanced diet and regular physical activity. The World Health Organization recommends a minimum of 150–300 minutes of moderate-intensity aerobic activity or 75–150 minutes of vigorous-intensity activity per week, alongside appropriate dietary practices. Despite these guidelines, evidence from literature reveals poor adherence among NCD patients, with Indian studies reporting non-adherence rates as high as 70%.

The COVID-19 pandemic further exacerbated lifestyle disruptions, posing additional barriers to maintaining healthy behaviors. To design meaningful, context-specific interventions, it is imperative to understand the underlying reasons for poor adherence, particularly from the perspectives of patients and healthcare providers. However, there is a paucity of research exploring both the barriers and practical solutions in the Indian primary healthcare context. There are limited studies exploring the barriers and solutions to diet and exercise non-adherence and hence this study was planned. Hence, the present study aims to determine the reasons for poor adherence to diet and physical activity among patients with

chronic NCDs and to prioritize the key action points to improve the adherence to diet and physical activity among patients with chronic NCDs.

This mixed-methods study was conducted in primary health center (PHCs) in Karaikal, South India, with the aim of identifying key factors contributing to non-adherence and to prioritize actionable solutions for enhancing dietary and physical activity compliance among patients living with chronic NCDs**.**

MATERIALS AND METHODS

Facility based study was carried out in NCD clinics in 5 PHC, Karaikal. We employed a sequential explanatory mixed method study (QUAN- QUAL). This study was conducted for period of 6 months in Jan24-JUN24 . NCD patients receiving treatment in PHC for more than 5 years were included for quantitative survey , PHC staffs such MO, Staff nurse, ANM & key stake holders in NPNCD programme were included for qualitative component . sample size desire sample of 250 NCD patients (QUAN) were selected using simple random sampling without replacement , sample size was calculated using open epi version 3.1 . in addition 20 PHC staff and stake holders were selected using purposive sampling based on the willingness, knowledge & availability the participant was selected .

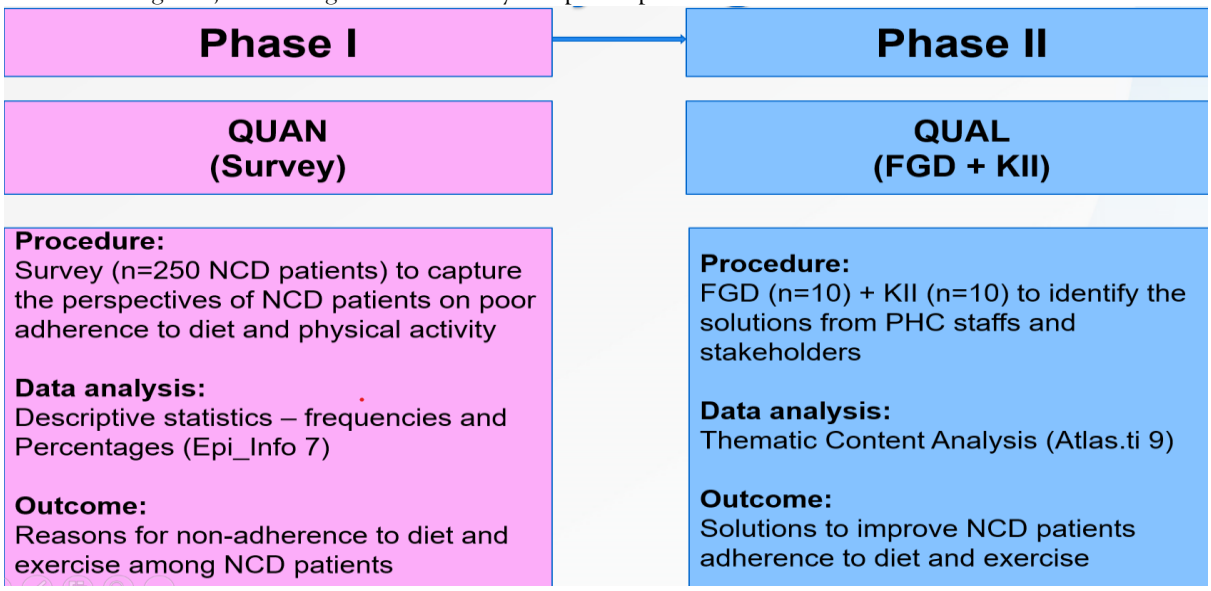

Figure .1. Visual diagram showing sequential explanatory mixed method study.

Data collection

QUAN

Principal Investigator collected the data using a pre-tested semi-structured questionnaire after obtaining a written informed consent. Data was collected in the respective PHCs during the morning hours. Information regarding the socio-demographic profile, NCD history, treatment history, diet and physical activity were obtained. 24 hour recall method and oral food frequency questionnaire were used to assess the diet pattern. 7-day physical activity recall questionnaire by Stanford was used to assess the physical activity.

QUAL

After survey, Focus Group Discussion (n=10) and Key Informants Interviews (n=10) were conducted. Participants were purposively selected based on their knowledge, availability and willingness to participate. PHCs staffs and stakeholders in NPCDCS were selected and the diversity of the participants was ensured to obtain more information on the phenomenon of interest. Results from the initial survey were shared with the participants to obtain their probable solutions .The discussions were audio-recorded and the verbal cues were note taken .

Data analysis

QUAN Data was entered and analysed in Epi_Info 7 software .Categorical variables were expressed as frequencies and percentages. **QUAL** Audio recordings were transcribed in English . Thematic Content Analysis was done using Atlas.ti 9 software. Deductive approach was followed .Similar codes were combined to derive categories and themes.

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RESULTS

Diet and exercise plays a pivotal role in preventing as well as containing the severity and complications of Non Communicable Diseases (NCDs) . Along with proper diet, people living with chronic conditions should do at least 150–300 minutes of moderate-intensity aerobic physical activity (or) at least 75–150 minutes of vigorous-intensity aerobic physical activity (WHO). But, literature shows that the adherence to diet and physical activity among NCD patients are unsatisfactory. In India, about 70% NCD patients showed non-adherence to healthy lifestyle (Banerjee A et al, 2021). Further, the current COVID-19 pandemic hampered healthy lifestyle . In order to plan a context-specific lifestyle intervention for NCD patients, community participation and stakeholders support are crucial. There are limited studies exploring the barriers and solutions to diet and exercise non-adherence and hence this study was planned. In India, about 70% NCD patients showed non-adherence to healthy lifestyle (Banerjee A et al, 2021). Further, the current COVID-19 pandemic hampered healthy lifestyle . In order to plan a context-specific lifestyle intervention for NCD patients, community participation and stakeholders support are crucial. There are limited studies exploring the barriers and solutions to diet and exercise non-adherence and hence this study was planned.

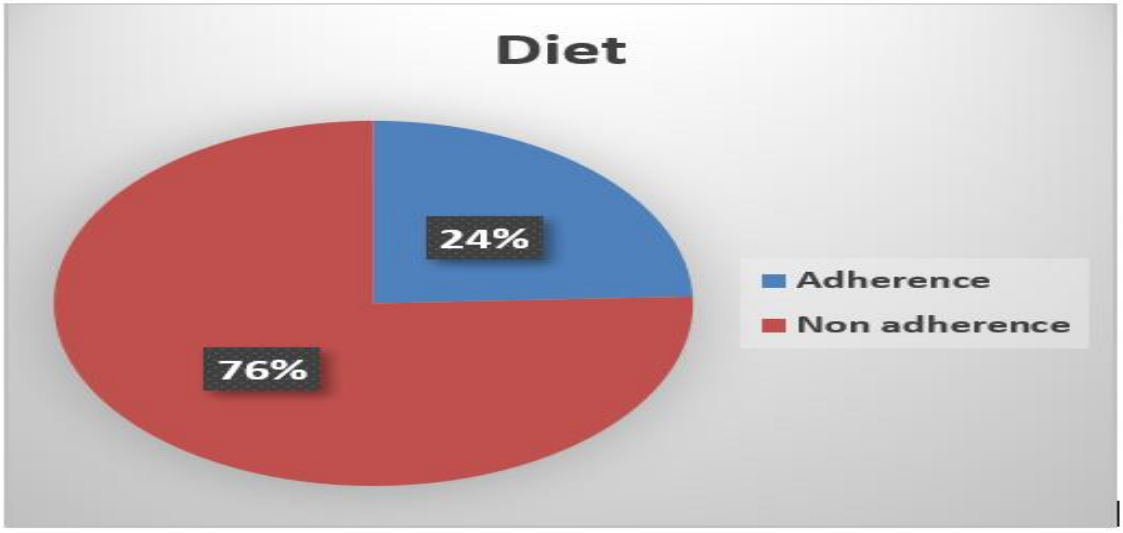
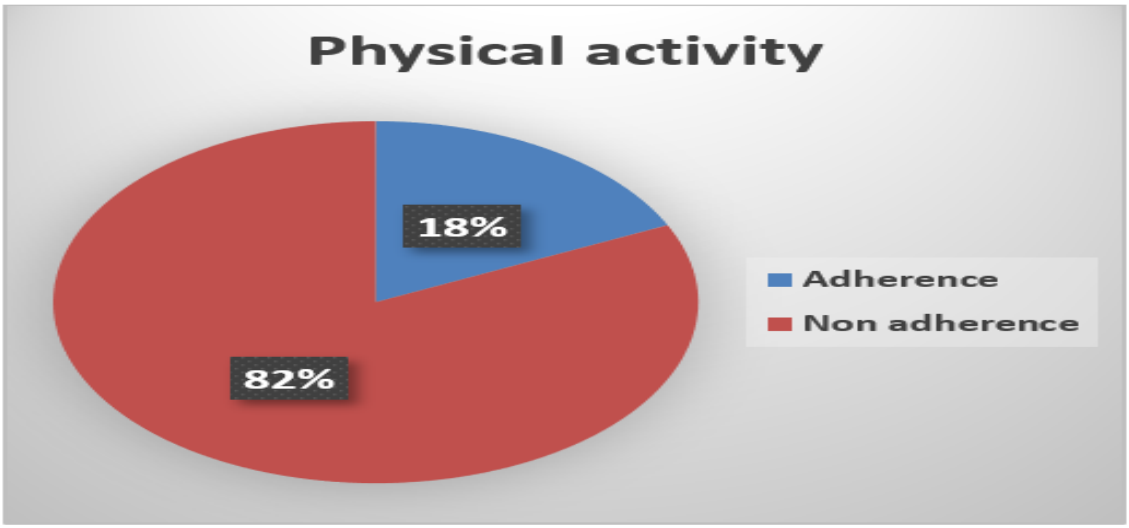


Figure:2 It potrays aadherence of diet among NCD patients, among 250 NCD patients interviewed almost N=189 (76%) didn't follow specific diet patent .Remaining 25% patient follwed diet pattern recommended for NCD patients.



Figures. 3 describes adherence to physical activity to NCD patients , majority n=205 (82%) of patients were physically inactive , the remaining 18% were doing some physical activity .

Table 1: Reasons for non-adherence to diet and physical activity among NCD patients [Multiple options]

Themes	Categories	Solutions to improve adherence to diet and physical activity
Individual level	Reminder diaries	"Maintaining a diary for diet plan and physical activity for a week" "Prepare a specific diet & exercise plan in consultation with dietician and note down"
	Reduce mobile phone usage	"Limit social media usage" "Engage in constructive activities"
	Trying new dishes	"Try to make innovations with the healthy meal plan"
	Kitchen garden	"Maintaining a Kitchen garden for organic fruits and vegetables"
Family/ Workplace level	Engaging other family members	"Health education sessions for caregivers & other family members" "Discussion among family members about the diet plan & exercise"
	Peer support group formation	"Support group formation in the workplace among peers" "Working hours and workload should be regulated"
	Yoga and meditation	"Practicing yoga and meditation to relieve work stress"
Community level	HE/ IEC/ BCC	"Strengthen HE/ IEC/ BCC activities in NCD Clinics and community" "Periodic home visits by the healthcare workers"
	Innovations in food production	"Increase the production and distribution of low-cost healthy foods by genetic engineering and food fortification"
	Inspection and licensing of food outlets	"Decrease the food outlets and online food delivery systems by inspection and licensing" "Regulate attractive advertisements and offers for junk foods"
	Increase sports/recreational facilities	"Construct parks and recreational facilities in urban areas" "Separate paths for walking and cycling"

Table 1. gives the solutions and action points obtained from focus group discussion and key informant interview to improve the adherence to diet and physical activity among NCD patients. Similar codes were merged together to form categories. Further categories were concised to major themes . the direct from participants (verbatim) were given in double quotes. At the individual level reduction in mobile phone usage , try new dishes and maintaining kitchen garden were the common solutions recommended by key informants .At the family / workplace level engagement other family members peer support group formation and practicing yoga and meditation were the strategies suggested by PHC staffs , stake holders and programme officers in NCD program. At the community level strengthen the HE/ IEC/ BCC activities , Innovations in food production , Inspection and licensing of food outlets and Increase sports/recreational facilities were common action points obtained from FGD and KII.

Reasons for non-adherence to diet [n = 189]	**n** (%)
Work load and work stress	165 (87.3)
Taste of the food	144 (76.2)
Easy availability of fast foods	142 (75.1)
Lack of family and peer support	91 (48.1)
Unawareness	87 (46.0)
Reasons for non-adherence to physical activity [n = 205]	**n** (%)
Lack of time	157 (76.6)
Lack of self-motivation	133 (64.9)
Physical weakness and tiredness	115 (56.1)
Lack of recreational facilities	98 (47.8)
Increased mobile phone usage and internet addiction	85 (41.5)

Table 2. shows that work load and work stress (87.3 %) , taste of food (76.2%) , easy availability of fast foods (75.1%) , lack of family and peer support (48.1%), unawareness (46.0%) commonly stated reason for non-adherence to diet . Lack of time (76.6%) , lack of self motivation (64.9%) , physical weakness and tiredness (56.1%), lack of recreational facility (47.8%), increased mobile phone usage and internet addiction (41.5%) were the prime reasons for non-adherence to physical activity .

Table 2: Solutions obtained from FGD and KII to address poor adherence to diet and exercise among NCD patients [N = 20]

Table 2. gives the solutions and action points obtained from focus group discussion and key informant interview to improve the adherence to diet and physical activity among NCD patients. Similar codes were merged together to form categories. Further categories were concised to major themes . the direct from participants (verbatim) were given in double quotes. At the individual level reduction in mobile phone usage , try new dishes and maintaining kitchen garden were the common solutions recommended by key informants .At the family / workplace level engagement other family members peer support group formation and practicing yoga and meditation were the strategies suggested by PHC staffs , stake holders and programme officers in NCD program. At the community level strengthen the HE/ IEC/ BCC activities , Innovations in food production , Inspection and licensing of food outlets and Increase sports/recreational facilities were common action points obtained from FGD and KII.

DISCUSSION

In this present study, the reasons for non-adherence to diet and physical activity among patients with chronic non-communicable diseases (NCDs) in South India. For dietary non-adherence, work-related stress emerged as the most significant factor, cited by 87.3% of respondents. This was followed by the taste of the food (76.2%), easy availability of fast food (75.1%), lack of family/peer support (48.1%), and unawareness (46.0%). Regarding physical activity, lack of time was the primary barrier, mentioned by 76.6% of participants. Other common reasons included lack of self-motivation (64.9%), physical weakness and tiredness (56.1%), lack of recreational facilities (47.8%), and excessive mobile phone usage/internet addiction (41.5%).

Maintaining a reminder diary can be a practical intervention to enhance dietary adherence and physical activity among patients with non-communicable diseases (NCDs). In India, behavioral change techniques, including self-monitoring and structured reminders, have shown promise in improving adherence to healthier lifestyle choices. Research emphasizes that strategies incorporating theoretical frameworks, such

as the Health Belief Model, enhance individual accountability and motivation, crucial for managing NCDs effectively. Evidence suggests such tools promote sustainable changes in dietary patterns and physical activity, contributing to better health outcomes【6】.

reducing excessive mobile phone usage is crucial for addressing poor dietary adherence and physical inactivity among NCDs. Excessive screen time is linked to sedentary lifestyles and unhealthy dietary patterns, contributing to NCDs like obesity and diabetes【12】【13】. In India, where NCDs are a growing concern, interventions promoting reduced mobile usage can positively impact health behaviors by minimizing distractions and fostering mindful eating and physical activity【14】. Public health strategies should promote awareness about the dual impact of mobile technology and advocate for balanced use alongside health education campaigns【12】【14】

Encouraging patients with non-communicable diseases (NCDs) to try new, diverse, and culturally appropriate dishes can improve dietary adherence and address physical inactivity. In India, studies highlight that increased dietary diversity is associated with better health outcomes and lower prevalence of NCDs. Introducing new dishes not only enhances nutrient intake but also sustains engagement by reducing monotony in meals, fostering long-term adherence to healthy dietary patterns. Tailoring these interventions to local food preferences further supports behavior change and promotes overall well-being among individuals with NCDs【12】.

Maintaining a kitchen garden can significantly improve dietary adherence and physical activity among NCD patients in India. It promotes the consumption of fresh, pesticide-free produce, aligning with national health policies. The physical activity involved in gardening serves as moderate exercise, countering sedentary lifestyles. Community-based initiatives in India have shown the effectiveness of kitchen gardens in promoting health and well-being.

Engaging family and coworkers can be a powerful tool to address poor dietary adherence and physical inactivity among NCD patients. Family involvement in dietary planning and physical activity routines can create a supportive environment, while workplace interventions like walking meetings and healthy snack options can promote healthier behaviors. Research from India has shown that family-centered interventions and workplace initiatives can improve adherence to treatment plans and overall health outcomes. These strategies, when culturally tailored and integrated with national health policies like the National Health Mission, can significantly impact the management of NCDs in India.

Forming peer support groups is an effective strategy to improve dietary adherence and physical activity among NCD patients. These groups foster social support, motivation, and accountability, which can significantly influence behavior change. Studies in India have shown that group-based interventions, often led by trained peer facilitators, are particularly effective in motivating participants to adopt healthier lifestyles. These interventions have been linked to improvements in dietary habits, physical activity levels, and overall health outcomes, making them a cost-effective approach to NCD management.

At the family and workplace level, yoga and meditation offer an effective approach to addressing poor dietary adherence and physical inactivity among non-communicable disease (NCD) patients. Research from India highlights that yoga's integration of physical postures (asanas), controlled breathing (pranayama), and mindfulness through meditation enhances metabolic health, improves insulin sensitivity, and promotes stress reduction, which indirectly aids in better dietary control. Structured yoga programs have demonstrated significant benefits in managing NCD risk factors, particularly in reducing glucose levels and improving overall lifestyle adherence【12】.

Health education, information, education, and communication (IEC), and behavior change communication (BCC) are essential community-level strategies for addressing poor dietary adherence and physical inactivity among NCD patients. These approaches raise awareness, impart knowledge, and promote behavior modification through tailored communication tools and methods. IEC campaigns in India have effectively used diverse media like group discussions and puppet shows to engage communities and influence behavior change. BCC further empowers communities to adopt sustainable health practices through participatory interventions. Studies in India have shown the effectiveness of these methods in reducing NCD risk factors by providing communities with the knowledge and skills for healthier lifestyles, especially when supported by national health initiatives like the National Health Mission.

CONCLUSION

This mixed-methods study sheds light on the multifaceted reasons for poor adherence to dietary and physical activity guidelines among patients with chronic non-communicable diseases (NCDs) in South India. The quantitative phase revealed low adherence rates, primarily driven by lack of motivation, poor awareness, financial constraints, and cultural dietary practices. The qualitative insights from healthcare providers and stakeholders further emphasized systemic challenges such as limited counseling time, lack of community engagement, and inadequate follow-up mechanisms. Importantly, the study identified actionable solutions to address these gaps, including patient-centered counselling, family involvement, use of peer support groups, improved access to healthy food options, and structured community-based physical activity programs. Tailored behavior change communication strategies and culturally sensitive lifestyle interventions were recognized as key enablers for improved adherence. These findings are instrumental for policymakers and healthcare planners aiming to enhance chronic disease management in similar settings. Integrating community participation and local stakeholder support into NCD programs can lead to more sustainable health outcomes. Future interventions must prioritize context-specific, low-cost, and community-driven approaches to empower patients and families in managing chronic illnesses more effectively.

Conflict Of Interest

The authors do not have any conflict of interest

Disclosures

There is no disclosure of finance here.

REFERENCES

1. Singh T, Bhatnagar N, Moond GS. Lacunae in non-communicable disease control program: Need tofocus on adherence issues. J Family Med Prim Care 2017;6(3):610-5.
2. Arulmozhi S, Mahalakshmi T. Self care and medication adherence among typre 2 diabetics in Puducherry, Southern India: A hospital based study. J Clin Diagnostic Res 2014;8(4):1-3.
3. Rajasekharan D, Kulkarni V, Unnikrishnan B, Kumar N, Holla R, Thapar R. Self care activities amongpatients with diabetes attending a tertiary care hospital in Mangalore Karnataka, India. Ann Med HealthSci 2015;5(1):59-64.
4. Joseph LM, Lekha TR, Boban D, Jose P, Jeemon P. Perceived facilitators and barriers of enrolment,participation and adherence to a family based structured lifestyle modification interventions in Kerala,India: a qualitative study. Wellcome Open Res 2019;4:131.
5. Suan MAM, Asli SE, Abdullah WM, Shafie Z, Johari NH. Patient perspective on factors contributing tonon-adherence to dietary therapy: a qualitative study in multicultural population of Kedah, Malaysia.International Q Community Health Educ 2019;3(4):217-23.
6. Singh T, Bhatnagar N, Moond GS. Lacunae in noncommunicable disease control program: Need to focus on adherence issues! J Family Med Prim Care. 2017 Jul-Sep;6(3):610-615. doi: 10.4103/2249-4863.214434. PMID: 29417018; PMCID: PMC5787965.
7. Nath A, Shalini MA, Mathur P. Health systems challenges and opportunities in tackling non-communicable diseases in rural areas of India. Natl Med J India 2021;34:29-35.
8. Al-Kaabi J, Al Siyabi H, Oshagbemi A, Abuyassin H, Gharaibeh K, Abusnana S. Barriers and strategies for effective dietary sodium restriction in patients with chronic kidney disease. J Ren Nutr. 2020;30(1):12-22. doi:10.1053/j.jrn.2019.06.001
9. Teixeira PJ, Marques MM, Silva MN, Brunet J, Duda JL, Haerens L, et al. A classification of motivation and behavior change techniques used in self-determination theory-based interventions in health contexts. Motiv Sci. 2022;6(4):438-455. doi:10.1037/mot0000172
10. Patil SJ, Ruppar T, Koopman RJ, Lindbloom EJ, Elliott SG, Mehr DR, et al. Physical activity patterns in India: Results from the ICMR-INDIAB study. Int J Behav Nutr Phys Act. 2018;15(1):106. doi:10.1186/s12966-018-0730-0
11. Mathews E, Thankappan KR, Daivadanam M, Pratt M, Huffman MD. Cultural adaptation of a lifestyle intervention for type 2 diabetes prevention in South Asian communities in Kerala, India. BMC Public Health. 2021;21(1):1616. doi:10.1186/s12889-021-11578-y
12. Joshi SR, Vadivale M, Saxena R, Ray S, Sebastian M. Adherence issues in Indian patients managing chronic diseases. J Assoc Physicians India. 2019;67(1):48-53.
13. Narain JP, Garg R, Fric A. Noncommunicable diseases in the South-East Asia Region: The double burden and the need for urgent action. Natl Med J India. 2021;34(1):21-29. doi:10.4103/0970-258X.320127
14. Geldsetzer P, Manne-Goehler J, Theilmann M, Davies JI, Awasthi A, Vollmer S, et al. Diabetes and hypertension in India: A nationally representative study of 1.3 million adults. JAMA Intern Med. 2018;178(3):363-372. doi:10.1001/jamainternmed.2017.8094
15. Shankar A, Saini AG, Anand K, Sharma E, Sharma V. Qualitative exploration of barriers to healthy lifestyle among patients with chronic diseases in a Southern Indian tertiary care hospital. Indian J Community Med. 2019;44(2):173-177. doi:10.4103/ijcm.IJCM_259_18

16. Mehta P, Ramakrishnan TS, Sudhir PM, Dorairaj P, Geetha S, Kalra S. Adherence to dietary recommendations for patients with type 2 diabetes mellitus in rural areas of Puducherry: A mixed-methods study. Int J Diabetes Dev Ctries. 2017;37(3):205-213. doi:10.1007/s13410-016-0528-z
17. Bhattacharya S, Salve HR, Nongkynrih B. Adherence to medication and physical activity among people living with chronic disease in a coastal population of Southern India. J Family Med Prim Care. 2019;8(6):2143-2148. doi:10.4103/jfmpc.jfmpc_219_19
18. Nethan S, Sinha D, Mehrotra R. Non-communicable disease risk factors and their trends in India. Asian Pac J Cancer Prev. 2018;19(2):309-316. doi:10.22034/APJCP.2018.19.2.309
19. Rawal LB, Ali M, Pandav CS, Biswas T, Smith J, Homaira N, et al. Prevention and management of non-communicable disease during COVID-19 pandemic: A qualitative study in South Asia. BMJ Open. 2022;12(1):e051559. doi:10.1136/bmjopen-2021-051559