Journal of Taibah University Medical Sciences (2023) 18(6), 1364–1372

Taibah University

Journal of Taibah University Medical Sciences

www.sciencedirect.com

Full Length Article

Experience of establishing a lifestyle medicine clinic at primary care level- challenges and lessons learnt

Ayman Afify Konswa, MD [a,*], Lina Alolaiwi, MD [a,b], Maher Alsakkak, MD [b], Mohamed Aleissa, MD [b,c], Azzam Alotaibi, MD [b,d], Fadyah F. Alanazi, MSN [e] and Abdulaziz bin Rasheed, MD [b,f]

[a] *Family Medicine Department at Prince Sultan Military Medical City, KSA*
[b] *Saudi Board of Family Medicine, KSA*
[c] *CIC& LSM Clinics, Prince Sultan Military Medical City, KSA*
[d] *Al-Wazarat Health Center, Prince Sultan Military Medical City, KSA*
[e] *LSM Clinic, Prince Sultan Military Medical City, KSA*
[f] *Family Medicine Administration at Prince Sultan Military Medical City, KSA*

Received 29 December 2022; revised 27 April 2023; accepted 2 May 2023; Available online 16 May 2023

الملخص

تعد المملكة العربية السعودية من أعلى البلدان في معدلات السمنة والأمراض المرتبطة بها، وكذلك تعاني المملكة من نسب تدخين عالية بين الشباب والكبار وحتى المراهقين من الجنسين، حيث جاء في آخر إصدارات هيئة الصحة العامة أن السمنة كانت مسئولة عن أكثر من 70% من معدل الوفيات العام سنة 2020، وأن متوسط نسبة التدخين بالمملكة تصل إلى 20% تقريبا.

يعد "طب نمط الحياة" من الفروع المستحدثة في الممارسة الطبية المستندة إلى البراهين العلمية والأبحاث الطبية، بل إن كثيرا من الأدلة الارشادية الحديثة تذكر نمط الحياة الصحي كأول خطوة على طريق العلاج لمعظم أمراض القلب والشرايين والأمراض المزمنة.

في هذه الورقة العلمية نشرح تجربتنا -بإسهاب- في إنشاء عيادة لممارسة طب نمط الحياة وسط خدمات الرعاية الصحية الأولية والثانوية التي تتم بمركز طب الأسرة حي الوزارات، والذي يعتبر أكبر مراكز طب الأسرة بمدينة الأمير سلطان العسكرية الطبية.

هذه قصة نجاح نعرض فيها الدروس المستفادة وكيفية استغلال الظروف والواقع المتاح، وأيضا نتعرض للتحديات والصعوبات، مع وضع خطة امتداد طموحة لخدمة المرضى المستهدفين، ونعتقد أن هذه التجربة قد تفيد غيرنا لمحاولة تكرارها في ظروف وأماكن خدمة صحية أخرى.

الكلمات المفتاحية: طب نمط الحياة؛ الأمراض المزمنة؛ الرعاية الصحية الأولية

Abstract

On an international level, for more than 30 years, Lifestyle Medicine (LSM) Practice has had a great impact on both health Promotion and disease prevention. A practice which on a national KSA level, we are in eager need to adopt, due to the high prevalence of chronic diseases and unhealthy lifestyles. The establishment of the LSM clinic inside the Wazarat Health Center (WHC) more than one and half year ago, was a great advancement towards offering very important preventive and promotive services for people in real high need to these underutilized main elements in Primary Health Care (PHC) features. We identified quality oriented Key Performance Indicators and the clinically important outcomes for our patients. Our initial data showed great achievement on both fronts. We are currently studying the satisfaction of our customers and working on improving their level of health awareness and help seeking behavior. Furthermore, we are looking to benchmark our results. From our pilot project in WHC, we are preparing for an expansion plan to branch out other Primary Care centers in the Riyadh area to serve more people, and we aim to share the experience with other similar services and within the PHC centers allover KSA.

Keywords: Health promotion and disease prevention; Lifestyle medicine practice; Pilot project; Primary health care

* Corresponding address. Prince Sultan Military Medical City, KSA
E-mail: Iymen16@gmail.com (A.A. Konswa)
Peer review under responsibility of Taibah University.

ELSEVIER Production and hosting by Elsevier

 https://doi.org/10.1016/j.jtumed.2023.05.001

Background/the story

According to the World Health Organization report, non-communicable diseases (NCD) are responsible for more than 73% of all deaths globally. Cardiovascular diseases account for the majority of NCD deaths yearly. The lifestyle factors such as tobacco use, lack of physical activity, bad dietary habits and the use of harmful substances significantly raise the risk of death from NCD.[1] However, several of these risk factors for NCD are not being addressed adequately. The prevention model is very important and the best solution to the current situation, as it focuses on forestalling the occurrence of diseases.[2,3] 80% of the premature cardiovascular diseases and Diabetes type 2 can be prevented through abidance with health lifestyle choices.[1] Many systematic reviews and long-time observational studies of a very large number of included population have proved the consistent and significant association of total mortality, cardiovascular morbidity and mortality, and the prevalence of chronic diseases and disabilities to the lifestyle factors.[4–10]

Lifestyle medicine (LSM) is defined as "the evidence-based practice of helping individuals and families adopt and sustain healthy behaviors that affect health and quality of life".[11] It includes six pillars: a whole-food plant-rich diet, regular physical activity, restorative sleep, management of stresses, revocation of harmful substances and positive social relationships. These pillars are essential for treatment as well as the reversal of chronic diseases. They also have a very high impact in term of prevention.[12] The movement toward establishing a new specialty under the name of LSM by the American College of LSM (ACLM) goes back to 2004. The crucial step was in 2010 and 2011 after publishing the famous Journal of the American Medical Association (JAMA) article for the main competencies of LSM physicians.[13] Subsequently the International Board of LSM was established and the first residency program and board exam were held in 2017.

In KSA, the prevalence of chronic diseases is increasing, contributing to almost 73% of premature deaths in 2020.[14] Diabetes and hypertension are the most prevalent with prevalence rates of 23% and 26% respectively.[15] Moreover, the current overall smokers account for almost 20% of the Saudi population.[16]

The importance of lifestyle medicine was very well illustrated in the recent Saudi health care reform in vision 2030. It highlighted the increasing burden and cost of chronic disease, and the lack of effective means to address these challenges, despite pharmaceutical advances. The Saudi model of care will be delivered through 42 interventions spread across six health care systems. One of the systems of care is "keep well". The following services are under the "keep well" system of care: Periodic Health Examination, Health Education or Promotion programs, Preventive Services, Disease Screening Programs, Mental Health Wellness, Dental Preventive Programs, Child Surveillance, and Social Services.[17,18]

Wazarat Healthcare Center (WHC) is the biggest Primary Health Care (PHC) in the Family and Community Medicine (FCM) Administration at Prince Sultan Military Medical City (PSMMC). It serves around 1500 patients daily in between walk-in services, appointments, and specialized clinics, offering treatment and preventive services besides health education and social support.

WHC is a Joint Commission for International Accreditation (JCI) accredited center since 2011 that struggles to offer high quality PC service to its customers. The average number of patients with diabetes who are seen only in our Chronic Illness clinics (CIC) exceeds 3000 monthly.

This article details and documents the experience of establishing a new clinical service, by applying the LSM concept in our institution to offer an integrated preventive, promotive and curative service for those likely to have chronic diseases like Diabetes Type 2, Hypertension, Cardiovascular diseases, and Cancers.

The rationale for initiating the service was the high burden of obesity and smoking, including all related health consequences within our target population presented at PHC centers related to PSMMC. Simultaneously, to satisfy the two important Key Performance Indicators (KPIs) in the 2020 Medical Services General Directorate of the Ministry of Defense (MODHS) manual for healthy lifestyle and prevention: body mass index (BMI) screening and follow up plan, and the tobacco use: screening and cessation intervention, which were not fully covered in primary health care centers at PSMMC.

Based upon the framework of chronic diseases care model, we strategies our work; optimizing using our available resources with the higher admin support, approaching local community needs and in addition trying to raise their health awareness, augmenting patient-centered care approaches, and working upon strengthening staff capabilities, skills and privileges using the updated higher level of evidence.[19]

Methodology/approach

A strategic decision was taken by the higher management of the FCM department at PSMMC, in collaboration with the quality department for optimum resources reallocation, by launching a new service that targets a risky population without chronic comorbidities (mainly obese and smokers). Simultaneously satisfying the two strategic KPIs. for the MODHS and getting the benefit of available human and non-human resources without placing an extra burden on our department.

Goals of the projects:

- To increase the screening rate for both BMI and smoking at primary health care centers at PSMMC from below 40% to be above 90% within the next six months.

- To have a channel for proper referral and follow-up for patients who are obese and those that smoke within the PC facility to be fully served by the needed preventive and promotive approaches.
- To offer adapted recent guidelines for the management of obesity and smoking at the level of PHC for PSMMC end users.
- To have an impact toward leading and sharing a healthy lifestyle change within our local community.

Design

A Lifestyle Medicine Clinic was established at the family medicine department at Prince Sultan Military Medical City by the beginning of 2021 in response to all the above-mentioned factors. It started gradually with one physician at the beginning covering one day clinic only. After the initial launch and the pilot phase, with the primitive data about satisfying patients' needs, plus a high referral rate from the physicians, it was expanded to be a four-day clinic with three sessions (from 08:00 to 19: 00) per day and seven doctors covering the clinic. The current average number of patients seen per day is around 35 patients.

Target population

We tend to serve our target population with an appointment system based upon referrals from general clinics. Referral criteria to our clinic (after discussion with patients): Adults, and adolescents >14 years old with obesity (BMI of >30 kg/m2 but <45) or underweight (BMI <18.5 kg/m2), and/or adults' smoker. We are not accepting diabetic type 2 patients, pediatrics, pregnant ladies, or elderly more than 65 years old, all those are served by other clinics.

Staff members

The clinic includes the following team members (Table 1 shows the details along with the allocated task).

Forming a task force committee

Forming a task force committee of diverse backgrounds that work upon data collection, analysis, research, and areas for improvement, and arrange for regular monthly meetings for ourselves and other colleagues' continuous professional developments about all related scientific and administrative fields plus sharing in community campaigns activities.

This committee also worked upon a unique clinical identity through many meetings, and after revising our manual and internal literature. This meant to be spread within our province. It includes Vision, Mission, and slogan.

Clinic pathway

This flowchart explains the flow of the patient before visiting the clinic up to follow up or discharge, explaing the harmonious work between different team members (Figure 1).

Results

Approximately 2500 patients were treated in the clinic since the beginning of the service. Most patients were obese (90%) (Figure 2). Females account for more than half of the cases with a prevalence of 54%. Approximately 60−70% of the patients were new and 30−40% came for a follow-up. Moreover, 44% of the obese patients received Liraglutide treatment in conjunction with lifestyle modifications for the treatment of obesity. The majority of the obese patients lie within the obese class 2 category with slight disturbance in their metabolic parameters (Table 2). For the patients who came for a follow-up, the average weight loss after initiating treatment was 5.5−8.4% of the initial body weight in a three to four months period.

Efficacy of the clinic as a referral channel for obese and smoker

For the 1st and the 2nd objectives; it was depicted very clearly within the pilot phase (first year): The screening rate of the two KPIs. for which the lifestyle medicine clinic was established (smoking and BMI) after the launch of the clinic and within the first three to four months increased exponentially at the level of all PHC centers (Figures 3-4).

KPIs

During the real implementation phase (after the pilot period) and under monthly supervision; the followings KPIs were chosen:

- Percent (%) of obese and smoker patients who abide with the follow up appointments was chosen as a process indicator.

Table 1: Team members in the lifestyle medicine clinic.

Head of the Unit	Responsible for all administrative, auxiliary and logistics support, communication and coordination with higher managements and continuous quality improvement
Physicians	Responsible for the clinical evaluation and management of the patients
Health educators	Responsible for health education in the clinic
Dieticians	Responsible for providing dietary recommendations and counseling
Case manager	Responsible for managing the patient's appointment and clinical arrangements
Clinical pharmacists	Responsible for follow up and dose adjustment of medications if required
Lifestyle medicine clinic nurse	Responsible for calling the patients, taking the vital signs, and helping the physician inside the clinic and the clinic flow

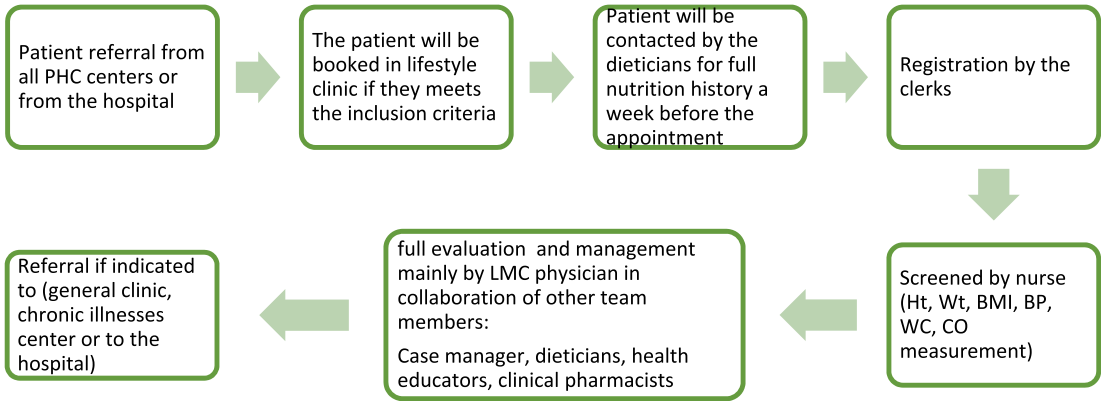

Figure 1: The clinical pathway inside lifestyle medicine clinic. Ht: height, Wt: weight, BMI: body mass index, BP blood pressure, WC: Waist circumference, CO measurement: carbon monoxide measurement.

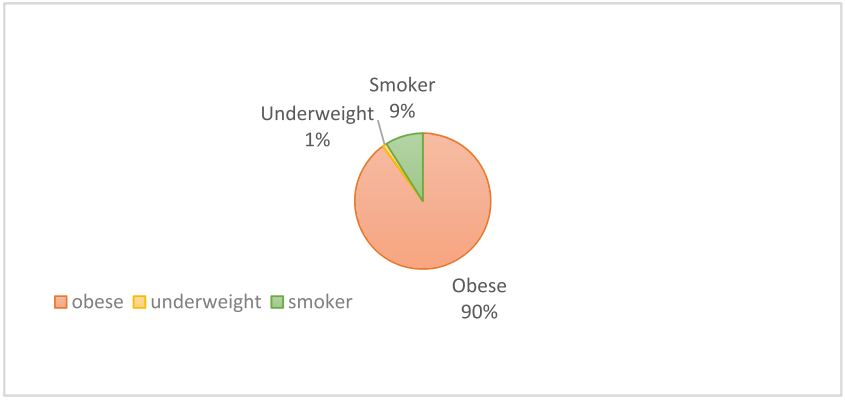

Figure 2: Percentage of patients seen in the lifestyle clinic.

Table 2: Base line data for treated patients in LSM clinic in a period of 4 months after finishing pilot period.

Month	Total No. of obese patients	Average baseline BMI	Average HbA1c (%)	Average TC (mmol)	Average HDL (mmol)	Average WC (cm)	Average BP (mmHg)
May 2022	188	39.09	5.7	4.9	1.26	103.8	139/83
June 2022	180	40.54	5.5	4.052	1	106.2	137/88
July 2022	95	37.84	6.08	5.3	1.31	99.5	128/74
August 2022	271	38.20	5.69	4.85	1.3	101.7	132/76
Total/Average	734	38.5	5.7	4.76	1.2	102.8	134/80

HbA1c: hemoglobin A1c; TC: total cholesterol; HDL: High Density Lipoprotein; WC: Waist Circumference; BP: Blood Pressure.

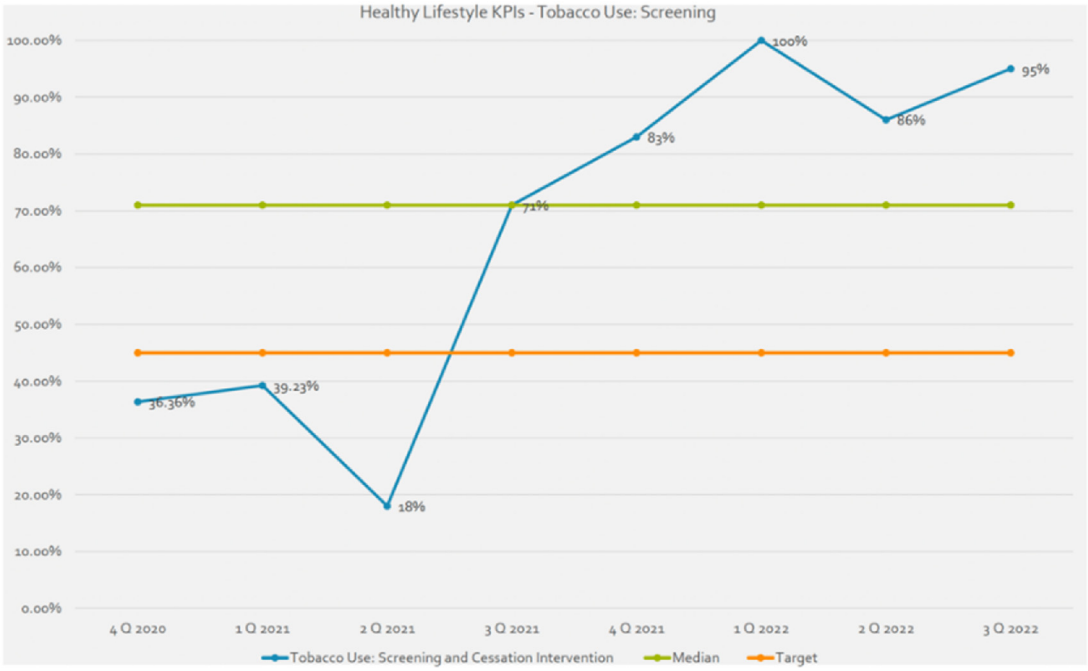

Figure 3: Rate of screening for smoking at primary health care centers- PSMMC increased from 36% in fourth quarter of 2020 to above 70% 2021 and 2022.

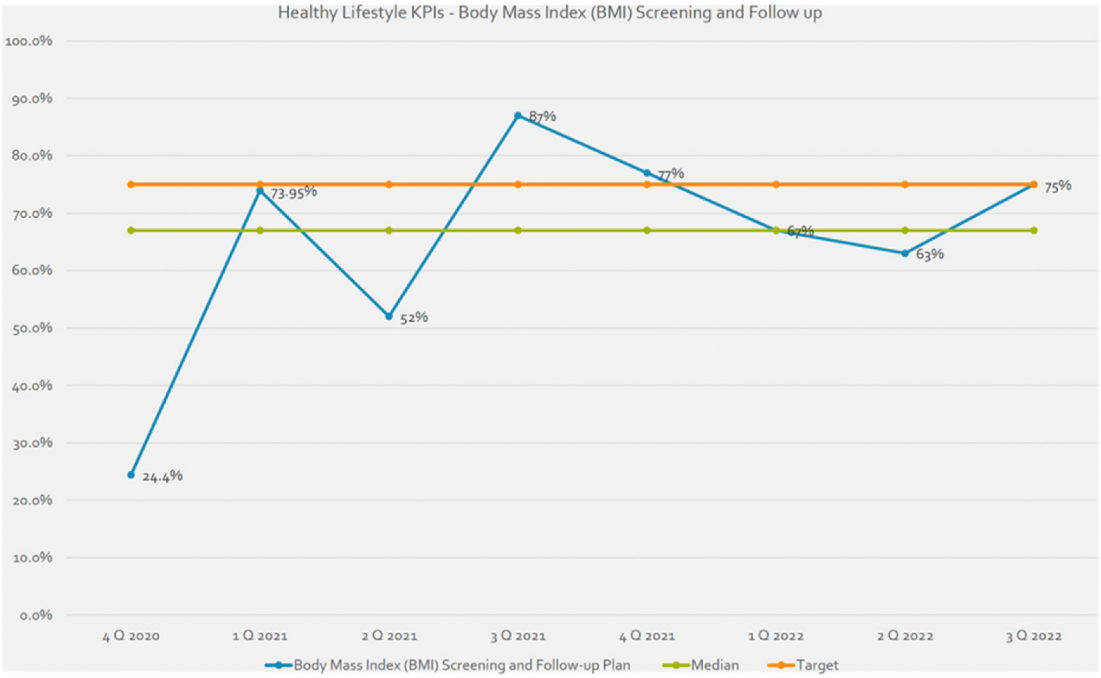

Figure 4: Rate of screening for BMI at primary health care centers- PSMMC increased from 24% in fourth quarter of 2020 to more percentages in 2021 and 2022.

- At least 5% weight loss from the presenting weight in the three months duration follow-up. And the number of smokers who succeeded in quitting smoking or reduced the smoking load at least a third of the initial smoking were chosen as interim outcome indicators (Table 3, and Figure 5).
- Preventive Service Index (PS's-i.) was calculated as the average of the results of all KPIs. of community wellbeing,

Table 3: Key Performance Indicators (KPIs).

Guideline	KPI	Measurements	Collected By whom
Smoking	1- Total number of smoker patients treated during this period	42 patients	A Family physician and a Case manager nurse
	2- Number (percent) of smokers succeeded in reducing/stopping smoking	24 patients (58%)	
	3- Number of smokers still in follow-up with the clinic	24 patients	
Obesity	1- Total number of obese patients treated during this period	566 patients	
	2- Number of patients who came for a follow-up	215 patients	
	3- Number (percent) of patients who achieved at least a 5% weight loss in three to four months follow-up	172 patients (80%)	

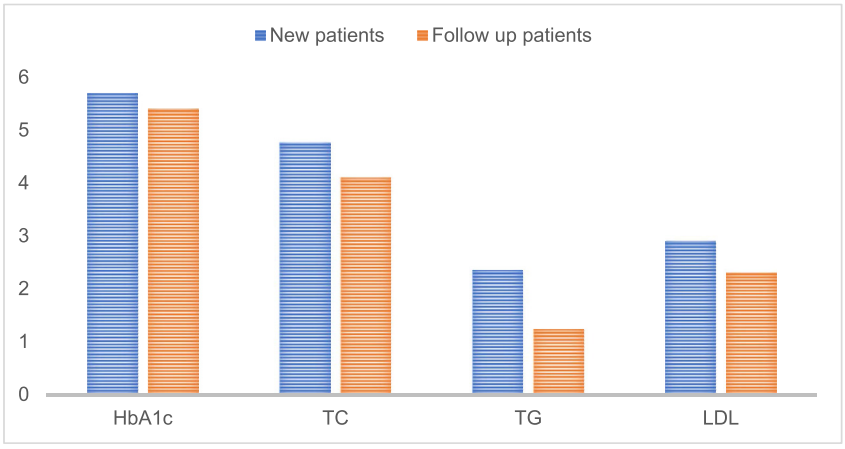

Figure 5: Levels of the metabolic paraments in obese patients who came for a follow-up is lower in comparison to new patients in the 3rd quarter. HbA1c: hemoglobin A1c; TC: total cholesterol; TG: triglycerides, LDL: low density lipoprotein.

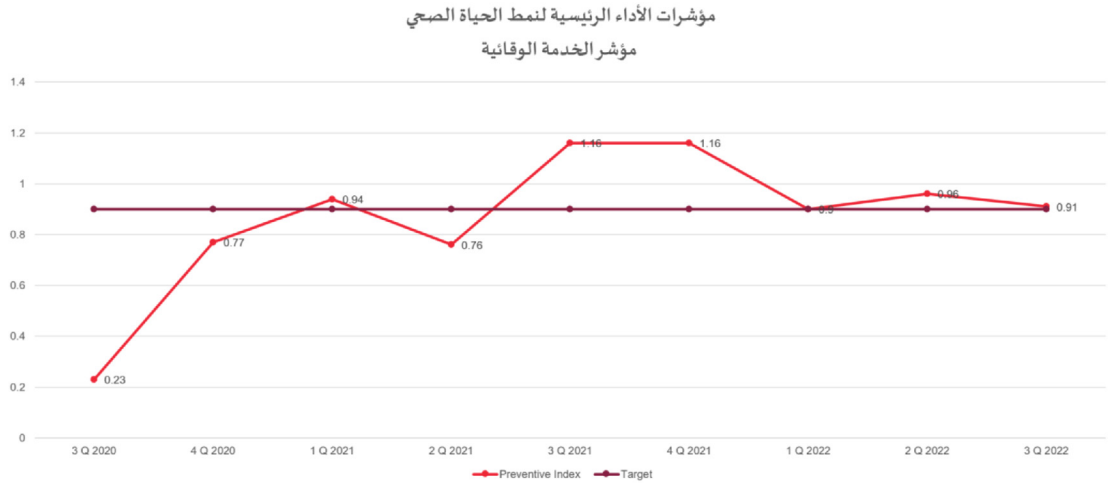

Figure 6: Preventive Service Index progress from launching of the clinic.

healthy lifestyle, and prevention (BMI, Tobacco, Blood Pressure& HbA1c) (Figure 6).

Table 3 and Figure 5 present the results from the 3rd quarter of 2022 results.

Discussion

According to ACLM, Lifestyle medicine should be practiced by every health care practitioners for every patient and during each encounter especially when it comes to PC, however lifestyle medicine could now be considered as a new medical specialty[20] that deserves to be offered through a specialized clinic that concentrate on this

promotive service through competent physicians and a multidisciplinary team who are trained, enthusiastic and are role-models for intensifying the benefit and the outcome of this clinic. Patients agreeing to have an appointment for a promotive or preventive service is vital to raise their awareness and readiness level to share with the health care team in the proper individual management plan.

Our clinic is customized as per our local situation; despite that we acknowledge that patients with type 2 diabetes deserved to be served as top prioritized patients through this service. We do not intend to duplicate our service and strive for optimum allocation of our resources, given our vast experience and the availability of CIC that comprehensively manages patients with diabetes. From this experience, this new service targeted patients with metabolic syndrome, central obesity, a sedentary lifestyle, pre/hypertension, and other risk factors prior to the development of frank type 2 diabetes mellitus. The same logic applied to serving adults only and not including pediatric age group due to the availability of a primary care comprehensive pediatric clinic, and the very morbid obese with BMI >45 kg/m2 as they have already another clinical channel to serve them.

For the outcome KPIs results, we don't have previous data to compare with, however we do believe that our initial data is very promising, for example, the target of smoking cessation or reduction, and the reduction in body weight and metabolic parameters. All these under meticulous collection with the new introduction of our health information system. We work to compare and analyze the follow up plan and the outcome impact with our well-established CIC clinics and other comparable services.

What we care about most is to achieve a change in patients' attitudes towards healthy lifestyle choices. We have a follow up rate that exceeds 60% in most of the months for our patients who came for listening and trying to abide with recommendations. Our staff also are continuously sharing in most of the health campaigns related to LSM either on site or through virtual activities, and almost always using the opportunity advocating about the clinic.

Plan for expansion of the clinic:

Two auditing process after six months and one year proved the efficiency of the clinic during the pilot phase in achieving the first goal, the screening rate for both smoking and BMI was raised exponentially very rapidly, and it is consistent till the moment (after more than two years). we are keen running the expansion of the service through recruiting more physicians -under certain inclusion criteria-to extend the clinic service to the entire weekdays and spread to other PC centers in PSMMC, recruiting more nurses (after interview and orientation), extending to offer virtual follow up consultation, and allowing for residents (from preventive family medicine residency programs) training. Our adapted guidelines are under piloting and preparation for publishing.

We aspire to accumulate and communicate our experience to accomplish a complete unit of Lifestyle medicine approaches for most of the at-risk population. It would include integrating our service within the comprehensive PHC services with a long-term plan of offering periodic evidence-based screening program for healthy and at-risk population and spreading important focused health promotion messages.

Lessons learnt/opportunities, and implications

- To be a change agent is a blessing that deserves a devotion; our approach and reputation has expanded, and it is extrapolated to the other family medicine or preventive medicine departments either in other military hospitals or Ministry of Health who want to repeat the experience.
- Obesity, physical inactivity, smoking, and chronic stress are the main contributors to chronic diseases, cardiovascular diseases, and cancers. We believe the clinic is offering a very valuable message to the PSMMC community and it is worthwhile to repeat it within other PC centers.
- The selection of dedicated team members who believe in ideas is crucial for the effort.
- Offering patient centered care is important in engaging patients towards better decision making especially in any lifestyle related changes; we came across many people who succeeded without medical intervention, due to the way the consultation is conducted, the enthusiasm inside the clinic, and the different spirit of the team.
- Mutual collaboration with other clinical sections inside the PSMMC gives us a wide scope of vision and helped to orient people more with our service.
- This clinic opened our eyes to apply for the SCFHS to have the very promising LSM fellowship within our academic affairs programs.
- The clinic has great qualitative and quantitative research potential; we already published one research paper,[21] and are looking for more impactful papers.
- We pursue our dedication to establish a complete unit with unique identity toward excellent integrated service through our clear vision, high administration support, and collecting feedback from our team and patients.

Limitations/challenges

- Busy clinic schedule, that is, 15 min for each patient, therefore sometimes it is difficult to provide a full consultation and counseling. However, this problem was compensated for by contacting the patients one week before the visit for a full lifestyle clinic discussion and subsequently the time will be saved in the clinic.
- The nearest appointment is after four to five months but the problem was overcome by opening more clinics to accommodate more patients.
- The number of no-show patients is considerably high ranging from 33% up to 47%. E are tackling this problem by contacting new patients prior to the clinic visit and by accepting walk in cases in certain circumstances.
- Smoking cessation medications are not available in our hospital yet; we are dealing with this obstacle via guiding our patients towards smoking cessation clinics related to the Ministry of Health in Riyadh province

plus continue out follow-up and supportive counseling plan, plus using the gradual smoking cessation techniques which proved its effectiveness in most of the cases.
- Since behavioral therapy plays an important role in the management of obesity and smoking cessation, there is a need for a clinical psychologist to be involved in the team; we are offering few coaching services inside the clinic, and we refer to psychiatry consultation whenever needed and accepted by the patients.
- We need a few resources in terms of equipment, like a body analyzer machine. A sports physician, and a health coach are also needed to be available when required within our team members.
- We have not applied any statistical significance result yet for outcome indicators, and we hope to compare our results soon with any available similar conditions benchmark service for optimal decision making.

Conclusion

Lifestyle medicine is the future of chronic diseases management as per the ACLM. KSA is now the leading country within the Arab countries in this movement, with many scientific, organizational, and collaborative events. Our qualified health care team identified and joined the move, and we are sharing in many of these events. We are targeting the benefit and better quality of life for patients of PSMMC as the cornerstone to achieve our vision and mission. And in our opinion, our experience can infer relevant other distributed health care services and justify them being discussed for better future extrapolations.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

Ethical approval from our Institutional Review Board was not required.

Authors' contributions

A.A.K.: Substantial contribution from conception, designing the work to drafting and revising. L.Alo.: Designing the work, analysis and interpretation, and a share in drafting. M.Ale.: Critical revision and final drafting + logistic support. M.Als.: From early conception and design of the work. A. bin R.: Final approval of the work and logistic support. F.Alo.: Acquisition, organizing and analysis of the data. A.Alo.: Final approval and logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Acknowledgement

We thank "Editage" team for their great proofreading effort.

We also thank Prof Tarek Al-Saied for his help in many linguistic& quality issues.

References

1. THE GLOBAL HEALTH OBSERVATORY, Explore a world of health data WHO accessed on: 2023 Feb. available at: https://www.who.int/data/gho/data/themes/noncommunicable-diseases.
2. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Correction: actual causes of death in the United States, 2000. **JAMA 2005 Jan 19**; 293(3): 293–294.
3. Fani Marvasti F, Stafford RS. From sick care to health care–reengineering prevention into the U.S. system. **N Engl J Med 2012 Sep 6**; 367(10): 889–891. https://doi.org/10.1056/NEJMp1206230. PMID: 22931257; PMCID: PMC4339086.
4. Loef Martin, Walach Harald. The combined effects of healthy lifestyle behaviors on all-cause mortality: a systematic review and meta-analysis. **Prev Med 2012**; 55(3): 163–170. https://doi.org/10.1016/j.ypmed.2012.06.017. ISSN 0091-7435.
5. Veronese N, Li Y, Manson JE, Willett WC, Fontana L, Hu FB, et al. Combined associations of body weight and lifestyle factors with all cause and cause specific mortality in men and women: prospective cohort study. **BMJ 2016**; 355: i5855. https://doi.org/10.1136/bmj.i5855.
6. Cynthia A, et al. Nutrition and physical activity cancer prevention guidelines, cancer risk, and mortality in the women's health initiative. **Cancer Prev Res 2014 January**; 7(1).
7. Kvaavik Elisabeth, et al. **Arch Intern Med 2010 Apr 26**; 170(8): 711–718.
8. Chakravarty Eliza F, et al. Lifestyle risk factors predict disability and death in healthy aging adults. **Am J Med 2012 February**; 125(2): 190–197.
9. https://www.nih.gov/sites/default/files/about-nih/impact/framingham-heart-study.pdf. Accessed Dec. 2022.
10. Yusuf Salim, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. **Lancet 2004**; 364(9438): 937–952.
11. American college of lifestyle medicine accessed at: accessed in October 2022 available at: https://lifestylemedicine.org/overview/.
12. *Foundation of lifestyle medicine board review course*. International board of lifestyle medicine; 2019. accessed during February 2023, https://lifestylemedicine.org/project/foundations-of-lifestyle-medicine-board-review-ce-cme/.
13. Lianov L, Johnson M. Physician competencies for prescribing lifestyle medicine. **JAMA 2010 Jul 14**; 304(2): 202–203.

14. GBD 2017 Saudi Arabia Collaborators. The burden of disease in Saudi Arabia 1990–2017: results from the global burden of disease study 2017. **Lancet Planet Health 2020**; 4: e195–e208. https://doi.org/10.1016/S2542-5196(20)30075-9.
15. Al-Nozha MM, Al-Maatouq MA, Al-Mazrou YY, Al-Harthi SS, Arafah MR, Khalil MZ, et al. Diabetes mellitus in Saudi Arabia. **Saudi Med J 2004 Nov**; 25(11): 1603–1610. PMID: 15573186.
16. GATS KSA. *Global adult tobacco survey*. Saudi MOH Portal; 2019.
17. Health sector transformation manual.] Riyadh: Ministry of Health; (https://www.moh.gov.sa/Ministry/MediaCenter/Publications/Documents/2018-11-01010.pdf, accessed 2 May 2019) [in Arabic)].
18. Vision 2030. *Health sector transformation strategy*. Riyadh: Ministry of Health; 2017. https://www.moh.gov.sa/en/Ministry/vro/Documents/Healthcare-Transformation-Strategy.pdf. [Accessed 23 April 2021].
19. Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? **Effect Clin Pract 1998 Aug-Sep**; 1(1): 2–4. PMID: 10345255.
20. Sayburn Anna. Lifestyle medicine: a new medical specialty? **BMJ 2018**; 363: k4442. https://doi.org/10.1136/bmj.k4442.
21. Muharib NS, Afifi A, Hakami MH. Personal physical activity and physical activity counseling habits among primary care physicians of Prince Sultan Military Medical City, Riyadh city, Saudi Arabia, Saudi. **J Sports Med 2018**; 21(3): 115.

How to cite this article: Konswa AA, Alolaiwi L, Alsakkak M, Aleissa M, Alotaibi A, Alanazi FF, Rasheed Abin. Experience of establishing a lifestyle medicine clinic at primary care level- challenges and lessons learnt. J Taibah Univ Med Sc 2023;18(6):1364–1372.