

Evaluating Diabetes and Cardiovascular Disease Risk at Health Melas in Preston and Burnley: Promoting Lifestyle Changes, Enhancing Healthcare Management, and Providing Hands-On Experience for Students

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Highlights

- The Health Melas in Preston and Burnley effectively identified undiagnosed health conditions in participants, highlighting the importance of regular community health screenings.
- High-risk individuals were referred to their GPs for further management to receive appropriate medical attention and lifestyle modification advice.
- Students gained valuable hands-on experience and provided positive feedback, indicating successful engagement and education of the community on health matters.

Abstract

Background: Community health events such as Health Melas are critical in identifying undiagnosed health conditions and promoting public health. This study evaluates the effectiveness of Health Melas, which was conducted in Preston and Burnley, in assessing diabetes and cardiovascular disease (CVD) risk. It also explores the dual benefits of these events in enhancing healthcare management and providing practical training for students.

Methods: The Health Mela 2024, a collaborative effort between the National Forum for Health and Well-being (NFHW) and the University of Central Lancashire (UCLan) School of Medicine and Dentistry, was conducted in Preston on Apr 13 and in Burnley on May 11. Health screenings were provided to 170 participants in Preston and 71 in Burnley, with data analysis performed on 149 and 56 complete datasets, respectively. Participants underwent assessments, including anthropometric measurements, blood pressure, and blood biochemistry. Both participant and student feedback were collected to gauge the impact of the Health Melas.

Results: Out of the 205 participants analysed, 64 were healthy, 48 had previously diagnosed conditions, and 93 were newly diagnosed with conditions including obesity, dyslipidaemia, hypertension, and diabetes. Specifically, 20 participants were newly identified as obese, 41 had dyslipidaemia, 20 had hypertension, and 12 had diabetes. High diabetes risk was noted in 37 participants, and elevated CVD risk was found in 36 participants. All newly diagnosed individuals were referred to their General Practitioners (GPs) for further management. Students reported significant improvements in clinical skills and community health understanding.

Conclusion: The Health Melas in Preston and Burnley successfully identified many undiagnosed diabetes and CVD cases, underscoring the importance of community health screenings. These events facilitated the early detection and management of chronic conditions and provided invaluable hands-on experience for students. Future initiatives should incorporate long-term follow-up and leverage technology to enhance the sustainability and impact of community health interventions.

Introduction

Health Melas have become increasingly popular for community health outreach, particularly in regions with diverse populations and varying access to healthcare services.^{1,2} These events offer a unique opportunity to assess and address the health needs of communities, focusing on preventive measures and early detection of chronic diseases. This study focuses on the Health Melas conducted in Preston and Burnley, aiming to evaluate the risk of diabetes and CVD among attendees, refer them to general practitioners (GPs) for healthcare management, and promote lifestyle modifications.

As a team from the University of Central Lancashire (UCLan), we joined the Health Mela this year, 2024. We are grateful for an opportunity given by the National Forum for Health and Wealth Being (NFHW) to participate in this Health Mela. It was our first year of experience with the Health Mela team. We had an excellent experience working with the Health Mela team. It was a grand platform that involved local communities, health organisations, and exhibitors. We encouraged all the visitors to get health checks done and to avail themselves of the information given at various exhibitor stalls. It was an excellent way to reach the local communities to promote general health and improve their awareness of health-related issues in a friendly environment. Additionally, the Health Mela event provided invaluable hands-on experience for students, bridging the gap between theoretical knowledge and practical application.

Diabetes is one of the most common chronic diseases in the UK, and its prevalence is increasing.³ A close link exists between diabetes and CVD, which is the most prevalent cause of morbidity and mortality in diabetic patients.^{4,5} Diabetes and CVDs are significant public health concerns worldwide, with increasing prevalence and substantial impacts on morbidity and mortality rates.^{4,5} Early detection and management of these conditions are crucial in reducing their burden.⁶ Health Melas serve as a practical platform for screening large numbers of individuals, identifying high-risk individuals, and connecting them with appropriate healthcare services.^{1,2,7}

In the United Kingdom, areas such as Preston and Burnley have diverse populations with varying levels of access to healthcare. Health Melas in these regions not only facilitate early detection of diabetes and CVD but also play a crucial role in educating the community about healthy lifestyles and preventive healthcare. Participants receive immediate feedback on their

health status and are guided towards making necessary lifestyle changes, potentially reducing the long-term burden on the healthcare system.^{8,9}

Furthermore, Health Melas offer significant benefits to students. These events provide a real-world environment where student trainees can practice their clinical skills, engage with diverse patient populations, and understand the practical aspects of community health initiatives. This hands-on experience is invaluable in shaping competent and compassionate healthcare professionals better equipped to address the needs of the communities they serve.^{10,11}

While the Health Melas conducted in Preston and Burnley have demonstrated potential in screening for diabetes and cardiovascular disease (CVD) risk, a significant gap exists in the literature regarding the feedback from students participating in these events. Specifically, there is limited understanding of how these experiences impact students' practical skills, confidence in clinical procedures, and knowledge of community health needs. Exploring this aspect could provide valuable insights into the educational benefits of Health Melas and help improve the design of future events to serve both the community and the trainees better.

This study aims to evaluate the effectiveness of Health Melas in Preston and Burnley in identifying individuals at risk for diabetes and CVD, referring them to GPs for further management, and encouraging lifestyle modifications. It will also explore the benefits these events offer students, enhancing their practical skills and understanding of community health.

Methodology

The National Forum for Health and Well-being (NFHW) (<http://www.nfhw.org.uk>) is a registered charity (1159443). The Trustees of the NFHW have permitted this research paper to be published on the condition that it is credited to the NFHW in all publications. Additionally, the Trustees grant permission for the NHS England (NHSE) to share and publish this research paper as part of their toolkit.

This study aims to evaluate the effectiveness of Health Melas conducted in Preston and Burnley in assessing the risk of diabetes and CVDs and their impact on healthcare management, lifestyle modifications, and students' practical skills and community health understanding.

Participants volunteered from the local communities of Preston and Burnley through advertisements in community centres, local newspapers, social media, and healthcare facilities. The study included adults aged 18 and above who were willing to participate and provide informed consent. Individuals with known severe chronic illnesses that require immediate medical attention beyond primary care were excluded during the registration process.

Screening Procedure:

Upon arrival at the Health Mela, participants registered and provided informed consent. Participants were assigned unique identifiers to maintain confidentiality.

Anthropometric Measurements

Height and Weight:

Height was measured using a stadiometer, and weight was measured using a calibrated digital scale. Body Mass Index (BMI) to assess central obesity was calculated using the formula: $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$.

Blood Pressure Assessments

Blood pressure was measured using an automated sphygmomanometer. Participants were seated and rested for at least 5 minutes before measurement. Three readings were taken at 1-minute intervals, and the average of the three readings was recorded.

Blood biochemistry:

A small blood sample was collected via finger prick. Random blood glucose levels and lipid profiles (total cholesterol and HDL) were measured using a portable glucose meter and lipid profile analyser. Appropriate adjustments were made during the analysis.

Student Feedback:

Students involved in the Health Mela were instructed to complete a feedback form regarding their experience, practical skills gained, confidence in clinical procedures, and understanding of community health needs.

Data Analysis

Quantitative Analysis:

Descriptive statistics summarised demographic data, anthropometric measurements, blood pressure and blood biochemistry.

Qualitative Analysis:

Student feedback was analysed thematically to identify common themes and insights regarding the Health Mela experience in Table 2.

Referral and Follow-up:

Data on the number of participants referred to GPs for further management was collected. Follow-up surveys will be conducted after six months to assess the impact of the Health Mela on participants' healthcare management and lifestyle modifications.

This comprehensive methodology provides a detailed evaluation of Health Mela's effectiveness in identifying and managing diabetes and CVD risk, promoting lifestyle changes, and enhancing students' practical skills and community health understanding.

Results

A total of 241 individuals availed themselves of the health screening facilities offered at these events, which was made possible with the invaluable assistance of student volunteers from Year 1 and Year 2 Medical, AUC Medicine, Pharmacy, and Biomedical Science programs. These dedicated students, eager to contribute to the community, had been diligently improving their soft clinical skills in preparation for the event over the preceding week. Activities included practising communication skills, history-taking, vital parameter measurements, and data recording. Alongside clinicians, students provided cardiovascular risk analysis and personalised advice to attendees, fostering a positive rapport evident in the smiling faces of students and community members.

Data analysis was conducted on a complete dataset comprising 205 participants, with 36 individuals excluded due to missing data. Of these, 64 were healthy (50 from Preston and 14 from Burnley), and 48 had previously diagnosed conditions (43 from Preston and 5 from Burnley). The events led to 93 new diagnoses, including 20 cases of obesity (10 from each location), 41 cases of dyslipidaemia (26 from Preston and 15 from Burnley), 20 cases of hypertension (11 from Preston and 9 from Burnley), and 12 cases of diabetes (9 from Preston and 3 from Burnley). Additionally, 37 participants were identified with a high risk of diabetes (22 from Preston and 15 from Burnley), and 36 were identified with a high risk of cardiovascular disease (19 from Preston and 17 from Burnley). Overall, 74 participants were referred to GPs for further evaluation (37 from each location). These findings underscore the Health Mela events' success in identifying undiagnosed conditions, assessing health risks, and facilitating referrals to healthcare providers, thereby contributing to better health outcomes for the participants.

Table 1: Summary of Health Assessments and Diagnoses

Category	Preston Mela	Burnley Mela	Combined Total
Total Participants	170	71	241
Excluded Due to Missing Data	21	15	36
Total Analyzed Participants	149	56	205
Healthy Individuals	50	14	64
Previously Diagnosed Conditions	43	5	48

Newly Diagnosed Conditions	56	37	93
• Newly Diagnosed with Obesity	10	10	20
• Newly Diagnosed with Dyslipidaemia	26	15	41
• Newly Diagnosed with Hypertension	11	9	20
• Newly Diagnosed with Diabetes	9	3	12
High Diabetes Risk	22	15	37
High CVD Risk	19	17	36
Referred to GPs	37	37	74
Previously Diagnosed (No Referral)	43	5	48

Abbreviations: CVD: Cardiovascular disease; GP: General Practioner

Table 2 summarises the responses collected from students during the Health Mela event. This feedback provides valuable insights into the effectiveness and impact of the event, highlighting areas of success and potential improvement. Most students found the Health Mela event informative and engaging, with all 35 respondents selecting "Yes, very much." This indicates a strong positive reception of the event's content and activities. Students were asked to choose their favourite parts of the event, with multiple responses allowed: Health screenings and assessments were the most favoured, followed by exhibits and displays. Most students (n=31) felt that interacting with patients during the Health Mela would benefit their future placements. Four more students found it helpful, indicating positive feedback on this aspect. The overall organisation and management of the event were rated from excellent to good, indicating that the event received predominantly high ratings. However, there is room for improvement in event management. Lastly, the overwhelming majority would recommend the event, highlighting its overall success and positive impact.

Table 2: Students feedback on their experience, practical skills gained, confidence in clinical procedures

Question	Response Options	Number of Responses (n=35)
1. Did you find the Health Mela event informative and engaging?	Yes, very much	35
	Somewhat	0
	Not really	0
	Not at all	0

2. What was part of the Health Mela event you enjoyed the most? (Select all that apply)	Health screenings and assessments	29
	Technical demonstrations	15
	Health talks during the breakfast meeting	10
	Exhibits and displays of health products and services	18
3. Did you think interacting with the patient during the Health Mela will help you in your future placements?	Yes, very much	31
	Somewhat	4
	Not really	0
	Not at all	0
4. On a scale of 1 to 5, how would you rate your communication skills when interacting with individuals from diverse cultural backgrounds during the Health Mela?	5	21
	4	13
	3	3
	2	0
	1	0
5. How comfortable were you working as a team member during the Health Mela? Please rate on a scale of 1 to 5.	5	31
	4	3
	3	1
	2	0
	1	0
6. On a scale of 1 to 5, how would you rate your understanding of the roles and responsibilities of different professionals involved in the Health Mela?	5	29
	4	6
	3	0
	2	0
	1	0
7. Did you feel the information provided at the Health Mela event was helpful and relevant to your health and well-being?	Yes, very much	32
	Somewhat	3
	Not really	0
	Not at all	0
8. How likely are you to change your lifestyle based on the information and resources provided at the Health Mela event?	Very likely	14
	Somewhat likely	17
	Neither likely nor unlikely	4
	Somewhat unlikely	0
	Very unlikely	0
9. How would you rate the overall organisation and management of the Health Mela event?	Excellent	22
	Good	12
	Fair	0
	Poor	1

	Very poor	0
10. Would you recommend the Health Mela event to your friends and family?	Yes, definitely	34
	Maybe	1
	No, not really	0
	No, definitely not	0
11. Overall, how would you rate your experience as a volunteer at the Health Mela? Please rate on a scale of 1 to 5.	5	30
	4	5
	3	0
	2	0
	1	0



Visitors attending different stations @Health Mela



Smoothie Bike station @NFHW



Visitor's data entry and counselling station



Blood Biochemistry station



Exhibitor stall

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Year 2 Medical students are engaged with young visitors at the Teddy Bear First aid clinic at Health Mela.

Discussion

The Health Melas held in Preston and Burnley provided a unique opportunity to assess the prevalence of diabetes and CVD risk among the local population. By setting up dedicated screening stations, the healthcare teams could perform various tests, including blood biochemistry measurements, blood pressure readings, and body mass index calculations. This data allowed us to identify high-risk individuals for chronic conditions, enabling timely interventions and referrals to appropriate medical services. Furthermore, the melas served as an invaluable training ground for students, who gained hands-on experience in patient assessment, risk factor identification, and providing attendees with health education and lifestyle guidance.

The combined results from the Preston and Burnley Health Melas in 2024 highlight the critical role of community health screenings in identifying and managing undiagnosed health conditions. Out of the 205 participants analysed, 93 individuals were newly diagnosed with conditions such as obesity, dyslipidaemia, hypertension, and diabetes. These findings underscore the prevalence of these conditions within the community and the importance of regular health screenings.

In Preston, 56 out of 149 participants (37.6%) were newly diagnosed with health conditions, whereas in Burnley, 37 out of 56 participants (66.1%) received new diagnoses. The combined data show a substantial proportion (45.4%) of participants had undiagnosed health issues, indicating a significant need for community health interventions. Dyslipidaemia was the most common new diagnosis (41 participants), followed by obesity (20 participants), hypertension (20 participants), and diabetes (12 participants). These findings align with existing literature highlighting the increasing prevalence of metabolic syndrome and cardiovascular risk factors in the general population.^{1,2,7} The risk assessments identified 37 participants with a high risk of diabetes and 36 with elevated cardiovascular disease (CVD) risk. Early identification of these risks is crucial for implementing preventive measures and reducing long-term complications.^{6,12,13}

All newly diagnosed participants were referred to their GPs for further management, emphasising the importance of follow-up care in managing chronic conditions. This referral process ensures participants receive appropriate medical attention and lifestyle modification advice to mitigate their health risks. The involvement of students from various programs (Medical, Pharmacy, and Biomedical Science) gave them practical experience in clinical skills,

communication, and community health engagement. These experiences are essential in preparing future healthcare professionals to address public health challenges effectively.^{1,13,14}

The student feedback from the Health Mela events provided a comprehensive understanding of participants' experiences and perceptions. All 35 respondents found the Health Mela event highly informative and engaging. Health screenings and assessments were the most favoured activity, with 29 participants highlighting this as a critical benefit. This indicates a high level of interest in practical, hands-on health evaluations. Exhibits and displays showcasing health products and services attracted significant attention, with 18 participants selecting this option. This suggests that interactive displays and access to health-related products and services are valuable event components. Technical demonstrations and talks on various health topics during breakfast meetings were appreciated by 15 and 10 participants, respectively. These elements likely provided educational value and practical insights, complementing the screenings and assessments. Most participants felt their interactions with patients during the Health Mela would benefit their future placements. This overwhelmingly positive feedback indicates that these events effectively prepared participants for real-world medical scenarios and patient interactions, a critical aspect of medical education.

The student feedback from the Health Mela events highlights its success in providing engaging, informative, and practical health-related activities that align with existing literature.^{10,11} The events also appear to positively impact student's preparedness for future medical placements and their likelihood of making lifestyle changes. To build on this success, future events could focus on maintaining high-quality health screenings and exhibits while addressing any logistical or organisational issues noted by the students. Additionally, ensuring clear communication and consistent feedback for all stations can help maintain high satisfaction levels and support student's learning experiences. Thus, the Health Mela events have proven to be a valuable initiative, effectively engaging students while fostering a supportive environment for their personal and professional growth.

Strengths, limitations and future directions:

The successful Health Mela 2024 events in Preston and Burnley emphasised the need for early detection and prevention of diabetes and CVD. Strengthening the collaboration between healthcare providers and community organisations will further empower residents to take proactive steps towards managing their health, fostering a holistic approach to combating these prevalent conditions.

Raising awareness about healthy behaviours is crucial in empowering individuals to participate actively in their health. By providing nutrition, physical activity, and stress management education, we equipped the community members with the knowledge and tools to adopt lifestyle changes that can significantly reduce their risk of diabetes and CVD. This holistic approach addresses the medical aspects of these conditions and empowers people to foster a more sustainable and transformative impact on overall health^{6,13,14}.

During Health Melas, medical students and aspiring healthcare professionals were given invaluable opportunities to hone their clinical skills and develop crucial interprofessional collaboration abilities by directly engaging with the local community. This hands-on experience enhances the trainees' practical knowledge and fosters empathy and commitment to delivering holistic, patient-centred care.

Despite its strengths, this study has some limitations. The study primarily collects data during the event, providing a snapshot but not capturing long-term outcomes. While participants were referred to general practitioners (GPs) for further management, the study does not systematically track follow-up visits or adherence to lifestyle modifications. This limits the ability to assess the long-term effectiveness of the Health Mela interventions. Feedback from participants and students relies on self-reported data, which may be subject to biases that impact its accuracy and reliability.

Conclusion

The successful execution of the Health Mela events in Preston highlighted the importance of community health screenings in identifying and managing previously undiagnosed health conditions, thereby contributing to better health outcomes. The events also provided valuable practical experience for students, contributing to their professional development. Addressing the identified limitations and incorporating long-term follow-up strategies can further enhance the impact of these community health initiatives.

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