



# Prevention of Non-Communicable Diseases Education By Monitoring Nutritional Status and Balanced Nutritional Patterns In Students and Migrant Workers in Saudi Arabia

**Muwakhidah, Listyani Hidayati, Retno Sintowati, Adelia Triana Putri, Siti Mulyati, Aulia Setyaningsih, Maulida Khotimah, Farisin Hanif Luthfilhadi, Muhammad Nabil Miqdam, Khayla Febriannisa, Rizkia Nur Ramadhani**

Program Studi Ilmu Gizi Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Surakarta

Program Studi Kedokteran Umum Fakultas Kedokteran, Universitas Muhammadiyah Surakarta

email : muw151@ums.ac.id

## ABSTRACT

Hypertension and diabetes mellitus are among the most prevalent non-communicable diseases (NCDs) worldwide, strongly influenced by dietary patterns and environmental factors. The prevalence of these conditions in Saudi Arabia remains notably high. Preventive efforts are essential and can be strengthened through routine anthropometric and biochemical monitoring, alongside education on balanced and healthy diets. A substantial number of Indonesian citizens — particularly migrant workers and students — reside in Saudi Arabia, making early NCD prevention crucial for sustaining their long-term health and productivity. This community service program aimed to improve the knowledge and awareness of Indonesian workers and students in Saudi Arabia regarding NCD prevention. The activities included anthropometric assessments, biochemical examinations, and educational sessions on infectious diseases and associated risk factors. The program was conducted in collaboration with PCIM Saudi Arabia and study groups consisting of mothers and students in Mecca. A total of 11 sessions were held in both online and offline formats. The webinar series comprised five sessions featuring speakers from PCIM, PPMI, and the PKMKI Team, and attracted 87 participants, including UMS students, university students, and migrant workers in Saudi Arabia. Pre- and post-test

results demonstrated a significant improvement in participants' knowledge following the webinars. Participants showed high enthusiasm, despite sessions being scheduled in the evening. This program is expected to enhance awareness among students and migrant workers about the importance of monitoring their nutritional status and maintaining a healthy diet as key strategies for preventing non-communicable.

**Keyword:** diabetes mellitus, balanced nutrition, hypertension, student, migrant workers.

## 1. Introduction

Non-communicable diseases (NCDs) are a global public health issue. Through this Community Service (CSP), we aim to design and implement an in-depth and holistic educational program. This program will impact the reduction of NCDs in the community, particularly among migrant workers and students residing abroad, thus improving public health.

Prevention of NCDs can be initiated early in various age groups. Students are among those in the productive age group who require optimal health. Students play a significant role in the future as agents of change. Early nutritional monitoring programs will foster positive motivation and attitudes toward health and its impact in the future. Meanwhile, migrant workers, often outside the mainstream of society, require additional support and understanding in maintaining a healthy lifestyle. This monitoring program will provide insights on how to better select, access, and utilize food in an environment that may not be fully hospitable to their needs.

This Community Service program aims to increase the understanding of NCDs among students and migrant workers in Saudi Arabia regarding nutritional monitoring and balanced diets related to infectious disease prevention. Thus, the primary goal of this Community Service Program is to create a broader positive impact by creating a society that understands how to monitor nutritional status and raises public awareness about balanced nutritional diets to prevent non-communicable diseases.

Diabetes mellitus (DM) is a global health

problem affecting approximately 537 million adults aged 20 to 79, or one in ten people. This alarming figure is projected to increase to 643 million by 2030 and to 783 million by 2045 (Kumar et al. 2024). Over fifty percent of university employees in Saudi Arabia studied had a non-communicable disease (Amin et al. 2014). The prevalence of NCD risk factors in Saudi Arabia is as follows: tobacco use 12.1%, low fruit and vegetable consumption 87%, low physical activity 94.9%, overweight/obesity 65.1%, and hypertension 37.5% (Al-Hanawi and Keetile 2021).

Risk factors for non-communicable diseases in Saudi Arabia include biological and behavioral factors. Biological factors include overweight/obesity, high blood pressure, high cholesterol, and high blood sugar levels. Behavioral factors include smoking, an unbalanced diet, and low physical activity (Alqunaibet, A., Herbst, C.H., El-Saharty, S., & Algwizani 2021). The prevalence of hypertension and diabetes mellitus among Indonesian citizens in Mecca and Jeddah is quite high. Lifestyle risk factors include high levels of overweight/obesity, low fruit and vegetable consumption, smoking, and overweight/obesity (Al-Hanawi and Keetile 2021).

Saudi Arabia is culturally home to many migrant workers and students. According to 2019 statistics from the Consulate General of the Republic of Indonesia in Saudi Arabia, there are 132,011 Indonesian citizens living in Mecca, consisting of 88,370 women and 43,641 men. There are 1,076 students studying at Saudi Arabian universities, with 43 residing in the Aziziyah district (Ummul Qura

University) (Indonesian Consulate General in Jeddah, 2019).

To date, there has been no monitoring of nutritional status related to the prevention of non-communicable diseases among students or migrant workers in Saudi Arabia. Muhammadiyah has several Muhammadiyah Special Branches (PCIM) abroad, including in Saudi Arabia, headquartered in Medina and covering the entire Saudi Arabian territory. In the Mecca region, there is a Mecca Branch, a study group for women and students in Mecca. These study sessions are held every two weeks. Therefore, the location for this community service activity will be the Aziziyah Da'wah Center in the Aziziyah area of Mecca, Saudi Arabia.

## 2. Methods

This community service activity is carried out in collaboration with the Muhammadiyah Special Branch Leadership (PCIM) and PPMI (Indonesian Student Association) in Saudi Arabia. This collaboration is expected to provide logistical support, networking, and in-depth local understanding of the conditions of students and migrant workers in Saudi Arabia. The stages of the community service activity are as follows:

- 1) Preliminary Study: Includes an in-depth analysis of the social, cultural, and diversity conditions in Saudi Arabia, as well as further identification of community understanding, nutritional status, and balanced nutritional diets.
- 2) Planning: Details the action plan for nutritional status monitoring, educational activity planning, and educational material development.
- 3) Implementation: Involves activities such as site surveys, nutritional status monitoring, and education within the student and migrant worker communities.
- 4) Evaluation: Conducts regular evaluations of the effectiveness of the activity by monitoring participation, gathering

feedback, and assessing the positive impacts. This evaluation will serve as the basis for adjusting the implemented strategy and approach.

- 5) Report: Prepare a final report that summarizes all Community Service (PKM) activities, evaluation results, findings, and recommendations for further steps or future program development.

This activity will consist of both online and offline sessions. Coordination with partners will be conducted online prior to implementation. The community service activity will begin with a five-session online webinar. This activity will be held online via Zoom in August 2025. The webinar will feature speakers from the PCIM (Citizenship Student Association) and PPMI (Indonesian Student Association) of Saudi Arabia, as well as lecturers from the UMS community service team. Participants will include Saudi Arabian students, migrant workers, and UMS students.

## 3. Results and Discussion

This activity began with coordination with PCIM Saudi Arabia in June 2025. This activity was held online via Zoom meeting with PCIM Saudi Arabia's partners. The purpose of this discussion was to coordinate the implementation of this international partnership's community service activities. The discussion revealed that this activity could be implemented after the Hajj pilgrimage, as PCIM will be assisting Indonesian pilgrims in Saudi Arabia in June and July 2025. This service activity began with an online webinar consisting of five sessions: two sessions from PCIM and PPMI, followed by sessions 3, 4, and 5 with speakers from the PKMKI team. The discussion agreed to hold the webinar in August 2025. After preparation and coordination with partners, webinar sessions 1, 2, 3, 4, and 5 were held on August 6, 13, 20, and 27, 2025.

The opening ceremony for the webinar took place on August 6, 2025, from 12:30 PM to 4:30 PM, via Zoom meeting. The webinar was opened by UMS Rector Prof. Dr. Harun

Joko Prayitno, M.Hum. The webinar series was attended by 87 participants, including UMS students, Indonesian students, and migrant workers living in Saudi Arabia.

**Tabel 1. Kegiatan Webinar PKMKI**

Kegiatan	Waktu	Rincian Kegiatan	Fasilitator
1	June 20, 2025	Online coordination with PCIM via Zoom meeting	Implementation and Community Service Team and Community Service Partners
2	August 6, 2025	Opening of Webinar by the Rector of UMS. Session 1 from the Chair of the Tabligh Council of PCIM Saudi Arabia on "Globalization of Progress: Muhammadiyah Abroad Building the Future"	Prof. Dr. Harun Joko Prayitno, M.Hum., Ustadz Erwin Febriadi Hamzah, S.Sos., BA., M.Pd.
2	August 6, 2025	Session 2 from the Chair of PPMI Saudi Arabia on: Facing Cultural Challenges Abroad: Strategies for Overcoming Culture Shock	Ustadz Zulfikar Ahmad Rabbani, S.Sos.
3	August 13, 2025	Webinar on Non-Communicable Diseases (NCDs), Risk Factors, and Prevention	Dr. Retno Sintowati, M.Sc.
4	August 20, 2025	The Importance of Monitoring Nutritional Status to Prevent Non-Communicable Diseases	Listyani Hidayati, M.Kes.
5	August 27, 2025	Balanced Nutritional Diet to Prevent NCDs	Muwakhidah, SKM., Kes.Epid.

The opening webinar was held on August 6, 2025, from 12:30 PM to 4:30 PM via Zoom meeting. The webinar was opened by the Rector of UMS, Prof. Dr. Harun Joko Prayitno, M.Hum. The webinar series was attended by 87 participants, consisting of UMS students, students, and Indonesian migrant workers living in Saudi Arabia.

### Webinar Sessions 1 and 2

Webinars 1 and 2 were held on August 6, 2025, from 12:30 PM to 4:30 PM Western Indonesian Time (WIB), or 8:30 AM to 12:30 PM Saudi Arabian time. This event marked the opening of a series of webinars opened by the Rector of UMS, Prof. Dr. Harun Joko Prayitno, M.Hum. The event was attended by the heads of PCIM and PPMI Saudi Arabia. The event involved the coordinator of the Mecca branch of Ummah, UMS students, and Saudi Arabian students.



**Figure 1. Opening by the Chancellor of UMS and remarks from the Chair of PCIM Saudi Arabia**



Agenda ini dimulai dengan pembukaan, Pembacaan Tilawah Al Quran, dan menyanyikan lagu Indonesia raya dan Sang Surya, sambutan dari ketua PKMKI, Ketua PCIM dan Rektor UMS. Kegiatan ini dilanjutkan dengan pemaparan materi dari ketua mejelis Tabligh PCIM ustadz Erwin Febriadi Hamzah, S.Sos.,BA.,M. Pd dengan materi “Globalisasi Kemajuan : Muhammadiyah di Luar Negeri Membangun Masa Depan” selama 45 menit kemudian dilanjutkan dengan diskusi. Materi yang ke 2 dipaparkan oleh ketua PPMI Arab Saudi ustadz Dzulfikar Ahmad Rabbani dengan materi Menghadapi Tantangan Budaya di Luar Negeri: Strategi Mengatasi Shock Culture dilanjutkan dengan diskusi selama 1,5 jam.

Webinar sesi 1 dan 2 dihadiri 87 peserta dan terlihat antusiasme dari peserta dengan pertanyaan seputar Muhammadiyah di kancah internasional dan juga tentang cara mengatasi shock culture ketika berada di Luar negeri terutama di Arab Saudi. Dokumentasi webinar sesi 1 dan 2 dapat dilihat dalam gambar 1 dan 2.

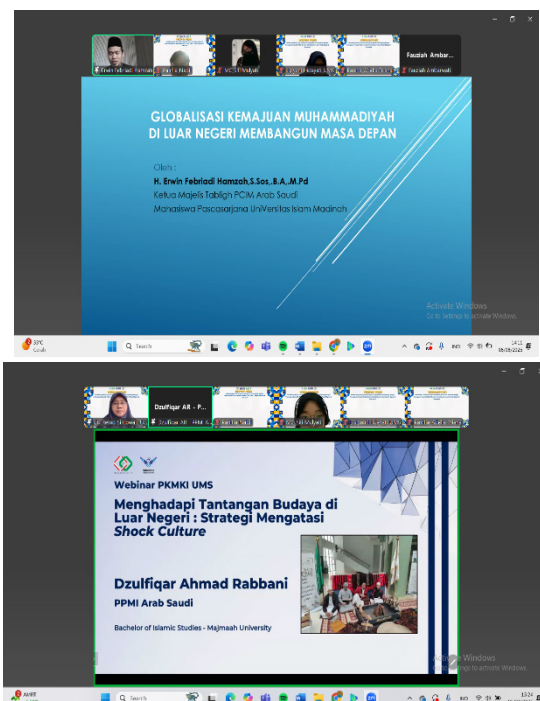


Figure 2. Webinar material for session 1 and session 2

A source from PCIM explained that Muhammadiyah is walking with the changing times, as stated in the Qur'an, Surah Ali Imran: 104

وَلْتَكُنْ مِنْكُمْ أُمَّةٌ يَدْعُونَ إِلَى الْخَيْرِ وَيَأْمُرُونَ بِالْمَعْرُوفِ وَيَنْهَوْنَ عَنِ الْمُنْكَرِ وَأُولَٰئِكَ هُمُ الْمُفْلِحُونَ

*"There should be among you a group of people who call for virtue, command (do) what is good, and forbid what is wrong. These are the lucky people" (QS. Ali Imran; 104)*

Muhammadiyah cadres are continuously adapting and developing their da'wah strategies to ensure their continued presence in a society that is evolving with the currents of globalization. Muhammadiyah certainly does not want to be left behind or complacent in this era of increasingly rapid technological development. As technology advances, da'wah must also advance to create a modern civilization that remains Islamic.

The engaging presentation by the resource person, which focused on the meaning of Muhammadiyah, inseparable from the slogan "Towards a Progressive Islam," highlighted the potential for "losing the battle" if it fails to position itself as a modern Islamic organization in this era of globalization, which is driving the emergence of new genres of community engagement. As an Islamic organization, Muhammadiyah must continue to develop rapidly in a time when Western civilization is leading, or tends to lead, in various sectors, as it is today.

The enthusiasm of participants in sessions 1 and 2 of the webinar was quite high, as evidenced by the discussion and questions raised during the questions about PCIM's role in Saudi Arabia and how to overcome culture shock while living in Saudi Arabia.

### Webinar Session 3

This webinar was delivered by Dr. Retno Sintowati, M.Kes., on NCDs, risk factors, and prevention. The event took place on August 13, 2025, from 7:30 PM to 10:00 PM. The presentation lasted approximately one hour, followed by a discussion and Q&A session. A pre-test was conducted via Zoom chat before the presentation.

This material explained the definition of Non-Communicable Diseases (NCDs) according to the Ministry of Health, namely: Chronic, slow-moving diseases that cannot be transmitted between humans, caused by degenerative processes such as cardiovascular disease, diabetes, cancer, etc. Risk factors for NCDs include both non-modifiable and modifiable factors. Non-modifiable factors include age, gender, and family/genetic history. Modifiable factors include unhealthy behaviors such as smoking, unhealthy diet, lack of physical activity, and the risk factors for metabolic syndrome, such as hypertension, dyslipidemia, diabetes, overweight, and obesity.

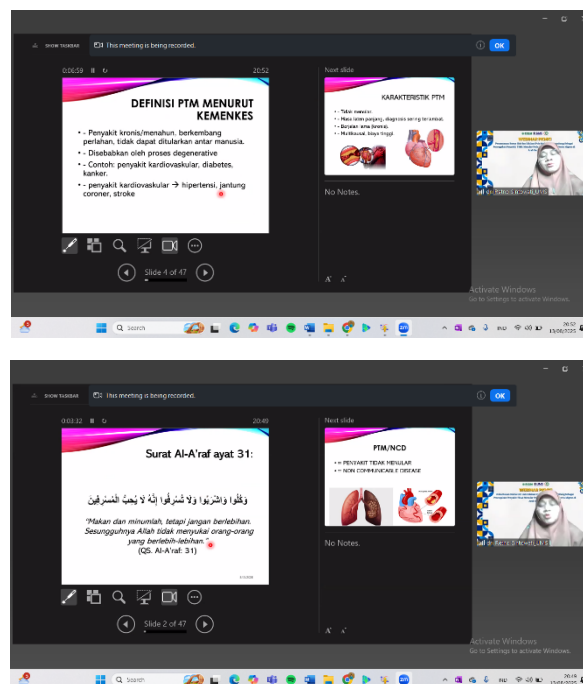


Figure 3 Webinar session 3 material

Despite being in the evening, participants were quite enthusiastic about the material and asked questions during the discussion and Q&A session. After the event concluded, a post-test was conducted via Zoom meeting. The pre-test and post-test results are as follows.

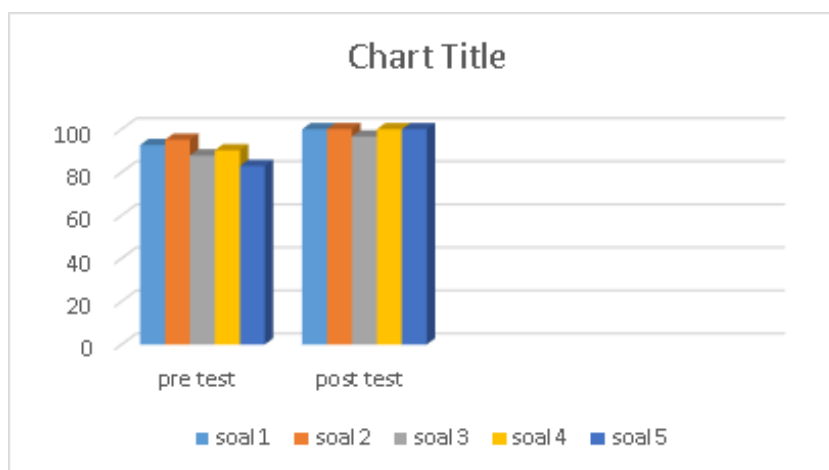


Figure 4. Increase in participant knowledge before and after education

Figure 4 shows an increase in knowledge scores before and after the webinar. This increase in knowledge is expected to influence healthy lifestyles and healthy eating patterns.

The early detection and prevention guide for non-communicable diseases also mentions the importance of CERDIK efforts in preventing non-communicable diseases, namely: 1)

Regular health checks, 2) Eliminating cigarette smoke, 3) Regular physical activity, 4) Balanced nutritional diet, 5) Adequate rest, and 6) Stress management (Ministry of Health 2021) (Kusumawati et al. 2023).

disampaikan oleh Listyani Hidayati ,M.Kes. Sebelum penyampaian materi dilakukan pretest terlebih dahulu. Penyampaian materi dilaksanakan selama 1 jam kemudian dilanjutkan dengan diskusi dan tanya jawab.

#### Webinar Sesi 4

Webinar ini dilaksanakan pada tanggal 20 Agustus 2025 pukul 19:30-22:00. Materi

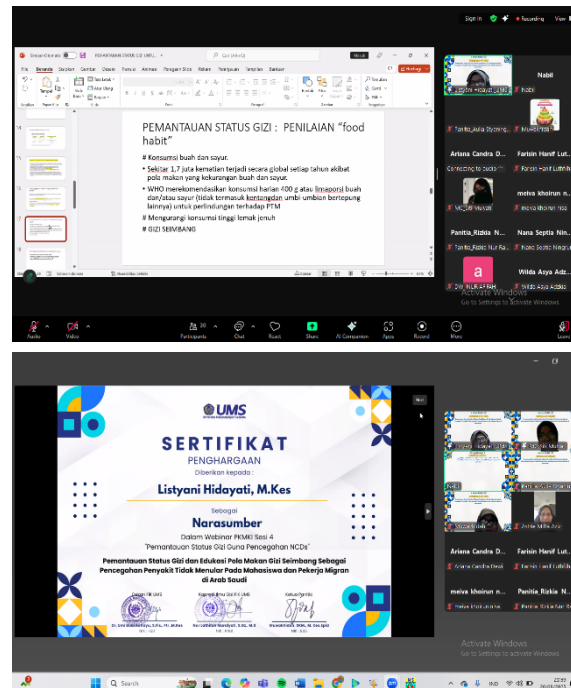
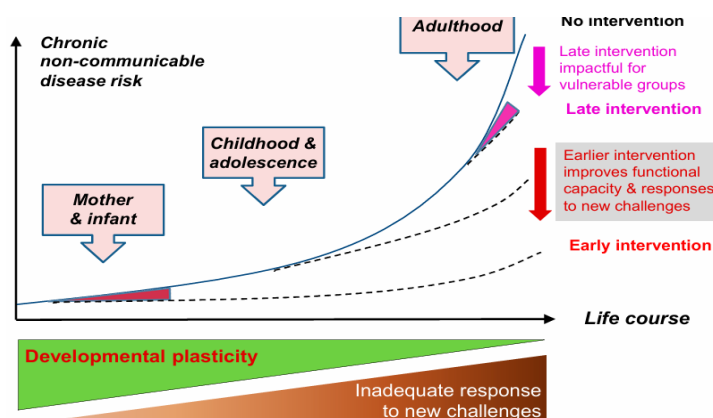


Figure 5. Webinar session 4

The material presented was “Monitoring Nutritional Status for the Prevention of Non-Communicable Diseases.” This activity explained the concept and importance of nutritional status, as well as anthropometric

and biochemical monitoring, and food habit assessment. The webinar also explained the timing of monitoring and interventions to prevent NCDs.



In this activity, the 7 Steps of the Healthy Living Community Movement were also presented, including: (1) Doing Physical Activity, (2) Eating fruits and vegetables, (3) Not smoking, (4) Not consuming alcoholic beverages, (5) Conducting regular health checks, (6) Maintaining environmental cleanliness, (7) Using toilets. Physical activity and a healthy and clean lifestyle are efforts in preventing disease. The recommended physical activity is for a minimum of 30 minutes 3-5 times a week.

After the presentation of the material, a post-test was conducted. The results of the pre-test and post-test are presented in Figure 5.

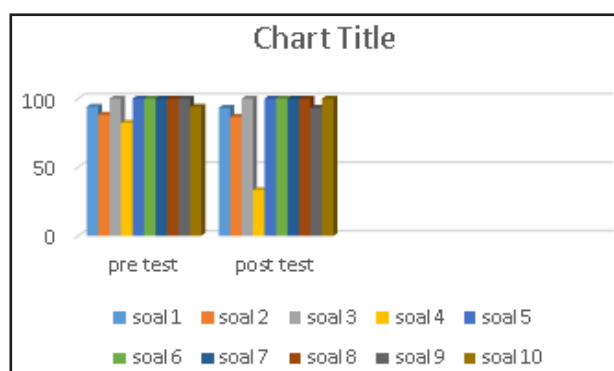
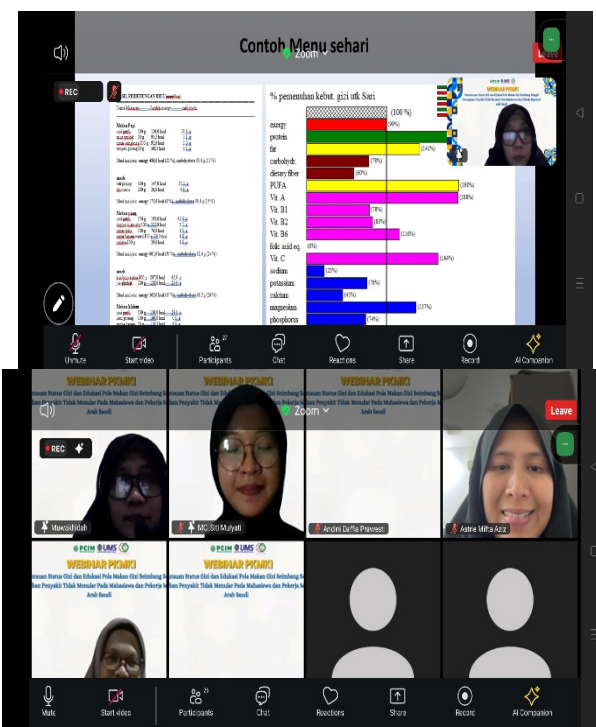


Figure 6. Increase in pre-test and post webinar participants

Figure 5 shows that most people's knowledge increased, although one question's score decreased. Although the activity took place in the evening, it did not dampen participants' enthusiasm for attending the event. Education, in the form of counseling and training on infectious disease prevention, has also been shown in other studies to improve the knowledge of integrated health post (Posyandu) cadres (Patimah et al. 2021). Another study on adolescents found similar results, indicating an increase in knowledge after providing education on non-communicable disease prevention using video media (Mahmudah, Priawantiputri, and Rahmat 2025).

## Webinar Session 5

This webinar session 5 was delivered on August 27, 2025, from 7:30 PM to 10:00 PM WIB. The presentation was delivered by Muwakhidah, SKM., M.Kes.Epid, on a Balanced Nutritional Diet for the Prevention of Non-Communicable Diseases. A pre-test was conducted before the presentation, followed by a 1-hour presentation, followed by a discussion and question-and-answer session.



Gambar 7. Webinar sesi 5

The material explained in this webinar session 5 includes a balanced nutritional diet and the relationship between nutrition and non-communicable diseases. A balanced diet is a combination of daily food menus that contain all the nutrients the body needs. Basically, no single food contains all the nutrients the body needs, so we must consume a variety of foods to meet the needs of macronutrients, such as carbohydrates, protein, fat and fiber, as well as micronutrients, namely vitamins and minerals.

A balanced nutritional diet in preventing NCDs includes: (1) Be grateful for and enjoy a variety of foods. (2) Eat plenty of vegetables



and sufficient fruit, (3) Get used to consuming high-protein side dishes, (4) Get used to consuming a variety of staple foods, (5) Limit consumption of sweet, salty, and fatty foods, (6) Get used to eating breakfast, (7) Get used to drinking water, (8) Get used to reading food packaging labels, (9) Wash your hands with soap and running water, (10) Do regular physical activity and maintain an ideal body weight. The results of the pretest and posttest

assessment of session 3 of this webinar can be seen in the increase in knowledge regarding balanced nutritional diet patterns, presented in Figure 6. Poor diet is a risk factor for overweight in adolescents (Fadhelina Luthfiah Azzahra and Inne Indraaryani Suryaalamasah 2024) Basic Health Research Data (Riskesdas. The occurrence of overweight in adolescents will be a risk for non-communicable diseases in the future.

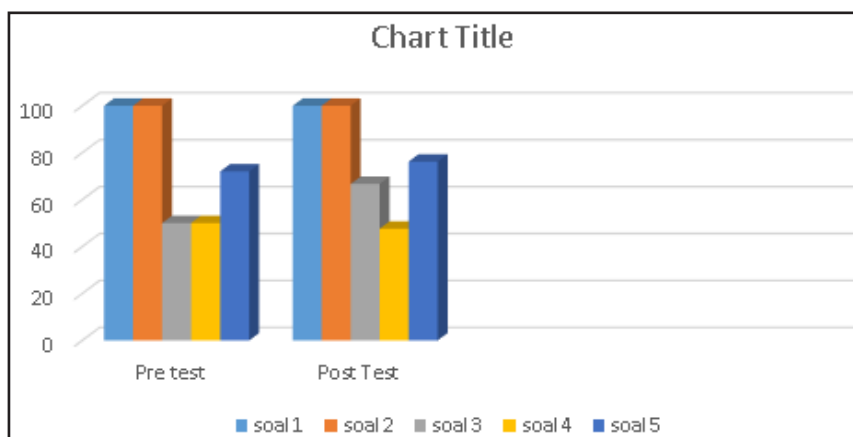


Figure 8 Pre-test and Post-test Results

Nutritional knowledge can influence attitudes and behaviors regarding balanced nutrition, which in turn impacts the nutritional status of students/migrant workers. Previous research has shown a relationship between knowledge and behavior regarding balanced nutrition (Fadhilah et al. 2023). This increased knowledge is expected to improve balanced nutritional eating patterns, as previous research has shown that balanced nutrition education can increase vegetable and fruit consumption in adolescents (Rarastiti 2022).

#### 4. Conclusion

The webinar on preventing non-communicable diseases by monitoring nutritional status and balanced diets for Saudi Arabian students and migrant workers was held in five sessions. The webinar involved speakers from partners, namely PCIM and PPMI Saudi Arabia, as well as a community

service team. The theme was nutritional status monitoring and education on balanced diets for the prevention of non-communicable diseases. Eighty-seven participants from the Saudi community and UMS students attended the webinar. The enthusiasm of the webinar participants was very good, even though sessions 3, 4, and 5 were held in the evening from 8:00 PM to 10:00 PM WIB. The results of the pre-test and post-test measurements showed an increase in participants' knowledge before and after the online education. It is hoped that this increased knowledge will impact changes in eating patterns, which can influence normal nutritional status and prevent the occurrence of non-communicable diseases in the future. This activity not only provides direct benefits for the Indonesian community in Saudi Arabia but also strengthens Muhammadiyah's international network in the fields of education and health.

## 5. Acknowledgement

We would like to express our gratitude to the management of PCIM and PPMI Saudi Arabia, as partners in this community

service program, as well as to the students and community of the Mecca branch of PCIM. We also extend our gratitude to Muhammadiyah University of Surakarta, which funded this community service.

## 6. References

- Al-Hanawi, Mohammed Khaled, and Mpho Keetile. 2021. "Socio-Economic and Demographic Correlates of Non-Communicable Disease Risk Factors Among Adults in Saudi Arabia." *Frontiers in Medicine* 8(April):1–11. doi: 10.3389/fmed.2021.605912.
- Alqunaibet, A., Herbst, C. H., El-Saharty, S., & Algwizani, A. (Eds. ). 2021. *Noncommunicable Diseases in Saudi Arabia: Toward Effective Interventions for Prevention*.
- Amin, Tarek Tawfik, Ali Ibrahim Al Sultan, Ola Abdelmoniem Mostafa, Amr Ahmed Darwish, and Mohamed Rashad Al-Naboli. 2014. "Profile of Non-Communicable Disease Risk Factors among Employees at a Saudi University." *Asian Pacific Journal of Cancer Prevention* 15(18):7897–7907. doi: 10.7314/APJCP.2014.15.18.7897.
- Fadhelina Luthfiah Azzahra, and Inne Indraaryani Suryaalamshah. 2024. "Hubungan Pengetahuan Gizi, Pola Makan, Dan Aktivitas Fisik Dengan Kejadian Status Gizi Lebih Pada Remaja Di Man 2 Jakarta Timur: The Relationship of Nutrition Knowledge, Eating Pattern, and Physical Activity with The Incidence of Overnutrition Status in Adolescents at MAN 2 East of Jakarta." *Jurnal Gizi dan Kesehatan* 16(1 SE-Articles):53–60. doi: 10.35473/jgk.v16i1.467.
- Fadhilah, Nur, Nufus Muthmainah, M. Mutalazimah, Dyah Intan Puspitasari, and Luluk Ria Rakhma. 2023. "Pengetahuan Gizi Seimbang Dengan Perilaku Gizi Seimbang Mahasiswa Kos Fakultas Ekonomi Bisnis Universitas Muhammadiyah Surakarta Balanced Nutrition Knowledge and Balanced Nutrition Behavior Boarding School Students , Faculty of Business Economics , Muhammadiyah University Surakarta." 21(1):58–67.
- Kemenkes, RI. 2021. *Cegah Dan Kendalikan Penyakit Tidak Menular (PTM)*.
- KJRI Jeddah. 2019. "Https://Kemlu.Go.Id/Jeddah/Kebijakan/Profil-Kjri-Jeddah."
- Kumar, Arvind, Ruby Gangwar, Abrar Ahmad Zargar, Ranjeet Kumar, and Amit Sharma. 2024. "Prevalence of Diabetes in India: A Review of IDF Diabetes Atlas 10th Edition." *Current Diabetes Reviews* 20(1):105–14.
- Kusumawati, Yuli, Kusuma Estu Werdani, Siti Zulaekah, Alfida Aulia, and Rahma Firdausy. 2023. *Buku Panduan Deteksi Dini Faktor Risiko Penyakit Tidak Menular*.
- Mahmudah, Umi, Witri Priawantiputri, and Mamat Rahmat. 2025. "Edukasi Gizi Berbasis Video Lebih Efektif Dalam Meningkatkan Pengetahuan Remaja Mengenai Gizi Seimbang Untuk Pencegahan Penyakit Tidak Menular." 35(2):827–38.
- Patimah, Sitti, Idhar Darlis, Masriadi Masriadi, and Nukman Nukman. 2021. "Upaya Pencegahan Dan Pengendalian Penyakit Tidak Menular Berbasis Masyarakat Melalui Kegiatan Penyuluhan Dan Pelatihan." *Caradde* 3(3):429–36. doi: 10.31960/caradde.v3i3.656.
- Rarastiti, Chairunisa Nur. 2022. "Hubungan Pengetahuan Gizi Seimbang Dengan Konsumsi Buah Dan Sayur Pada Remaja." *Jurnal Penelitian Inovatif* 2(2 SE-Artikel):281–88. doi: 10.54082/jupin.80.