Cardiovascular risk in seasonal migrant workers in Southern Italy: clinical-epidemiological evaluation

DOMENICO BASTA[1]
[1] University of Bari Aldo Moro, Italy - Medical Health Area, FARBAS Basilicata Environment Research Foundation, Italy

Keywords

Cardio-vascular risk • Arterial hypertension • Seasonal workers • Electrocardiogram • Spirometry

Summary

Introduction. *As part of the GOV.E.R.NI projects (Effective Government in Reports for New Integrations) and Più Su.Pr.Eme, project that is part of the three-year plan to combat labor exploitation in agriculture and the caporalato approved within the specific Caporalato Table promoted by the Directorate General for Immigration of the Ministry of Labor and Social Security with the aim of combating and overcoming all forms of serious labor exploitation and serious marginality and vulnerability of migrant workers in the territories that present the most critical issues in Southern Italy. The research institute FARBAS has carried out health surveillance activities on migrant workers in Basilicata with the aim of assessing the state of health and conditions that may put the health of workers at risk.*

Materials and Methods. *The epidemiological study concerns the analysis and study of data obtained from a cohort of 135 migrant workers hosting in two reception centers located in the territory of Basilicata (Italy) who have voluntarily joined the health screening activities by means of electrocardiogram examination, spirometry tests, blood pressure measurement and physiological and pathological history. Enlisted come from 12 Central African countries, with a mean age of 37.08 ± 9.8, of male gender.*

Results. *Analysis of clinical and instrumental data shows that 51.1 % of patients have higher than optimal blood pressure values; 42.2 % have higher than normal systolic blood pressure values, 11.1% have above-normal diastolic blood pressure values. From the analysis of the data obtained from the instrumental examinations it is clear that 20% of the subjects present an electrocardiogram indicating a pathological alteration and 14% of the population present an altered spirometry trace attributable to a pathological state. 64% of the population has a normal BMI, the overweight rate is 30.8 % while 1.5% has grade I obesity and the remaining 3.7 % is underweight.*

Discussion and conclusion. *The study shows a significant prevalence of arterial hypertension, cardiovascular disease and pathological changes in the respiratory system. In particular, the presence of risk factors such as high blood pressure associated with work factors such as maintaining difficult postures and working in the presence of heat represent a high risk to the health of seasonal workers working in the field of tomato harvesting in Southern Italy [1]. Future public health and preventive medicine actions should be geared towards precision health surveillance that can control, manage and reduce this risk to the health of workers.*

Background

The Più Su.Pr.Eme. project is part of the three-year plan to combat labor exploitation in agriculture and the caporalato, recently approved within the specific Caporalato Table promoted by the Directorate General for Immigration of the Ministry of Labour and Social Security. The program aims to implement an Integrated Extraordinary Plan of interventions aimed at combating and overcoming all forms of serious labour exploitation and serious marginality and vulnerability of migrant workers in the territories that present the most criticalities in the five Regions of the South that are the subject of the action. Encourage the overcoming of illegal conditions, through actions of prevention, surveillance, control and emergence of situations of serious labour exploitation in agriculture and through the experimentation of pilot projects of social agriculture. In Basilicata, the health and environmental research body FARBAS has been involved, with a team of experts, with surveillance and research on this issue. Health surveillance of migrant workers in Basilicata carries out a strategic action with the objective of protecting the health of migrants and preventing conditions that may endanger the health of workers. Some data with references to the health conditions most commonly encountered among these workers highlight a health picture mainly characterized by musculoskeletal diseases, respiratory disorders, gastrointestinal problems and a high prevalence of undiagnosed chronic diseases, such as hypertension and diabetes. Numerous reviews have shown that 40% of migrant agricultural workers reported musculoskeletal disorders, 25% chronic respiratory diseases and a significant number suffered from undiagnosed hypertension [2]. These data converge to show how precarious working conditions, difficulties in accessing care and exposure to environmental and social risks create a highly vulnerable health profile among migrant seasonal workers. This evidence reinforces the need to study and plan health surveillance actions and improve access to targeted health services for these populations.

https://doi.org/10.15167/2421-4248/jpmh2025.66.4.3115

Materials and Methods

- The epidemiological study concerns the analysis and study of data obtained from a cohort of 135 migrant workers hosting two reception facilities located in the territory of Basilicata who have voluntarily joined the health screening activities by means of electrocardiogram examination, spirometry tests, blood pressure measurement and physiological and pathological history. Enlisted come from 12 Central African countries, with a mean age of 37.08 ± 9.8.
- From the descriptive analysis of the sample of workers included in the survey for socio-demographic variables (sex, age, origin, type of profession).
- Subjects are aged between 22-65 years; with an average age ± SD: 37.08 ± 9.8.
- The subjects come from 12 Central African countries: Benin, Burkina Faso, Chad, Ivory Coast, Eritrea, Gambia, Ghana, Guinea, Mali, Niger, Nigeria, Sudan; as shown in Figure 1.

The work activity carried out is that of harvesting vegetables, in particular tomatoes in the fields of southern Italy in the summer season

Anamnestic data

The pathological history was reconstructed by a health professional through the use of a validated annex with the objective of providing clinical data that can complete the vision of the care picture of the migrant in Italy.
From the pathological history it emerges that:

- No subject reports having had an injury that requires hospitalization.
- 7 subjects underwent surgery (3 herniating discs - 2 appendectomy - 1 cholecystectomy - 1 intervention of the cardio-vascular system).
- 8 subjects suffer from hypertension.
- No one has suffered from neurological diseases (including stroke/epilepsy).
- 1 subject is diabetic.
- No one declares problems or pathologies affecting muscle and bone tissue.
- 1 subject declares visual disturbances.
- 1 subject declares to have contracted scabies and tuberculosis.

Anthropometric data

Body weight assessment was carried out using the Body Mass Index (BMI) which relates weight to height. This analysis shows that 64% of the population has a normal BMI, the overweight rate is 30.8%, 1.5% has grade I obesity and the remaining 3.7% is underweight as shown in Figure 2.

Blood pressure

Blood pressure, systolic (PAS) or diastolic (PAD) parameters have been the subject of numerous studies, some of which establish an association between the increase in these parameters and mortality, particularly at middle ages [3]. According to the World Health Organization (WHO) [4], at least 1 in 5 adults in the world suffer from hypertension and this factor is the cause of about half of deaths from heart attack and ischemic stroke. Blood pressure was measured by an experienced operator using an aneroid sphygmomanometer (non-invasive method) according to guidelines provided by the World Health Organization (WHO). The analysis of the data from the reference sample shows that 51.1% of patients have higher than optimal blood pressure values (Fig. 3); 42.2% have higher than normal systolic blood pressure values, 11.1% have higher than normal diastolic blood pressure values, it can therefore be stated that in

Fig. 1. Countries of origin of the enlisted subjects.

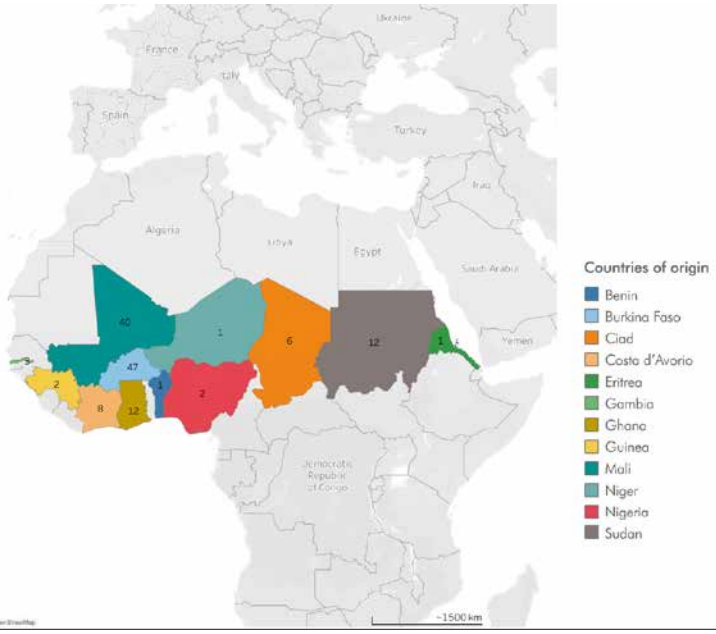
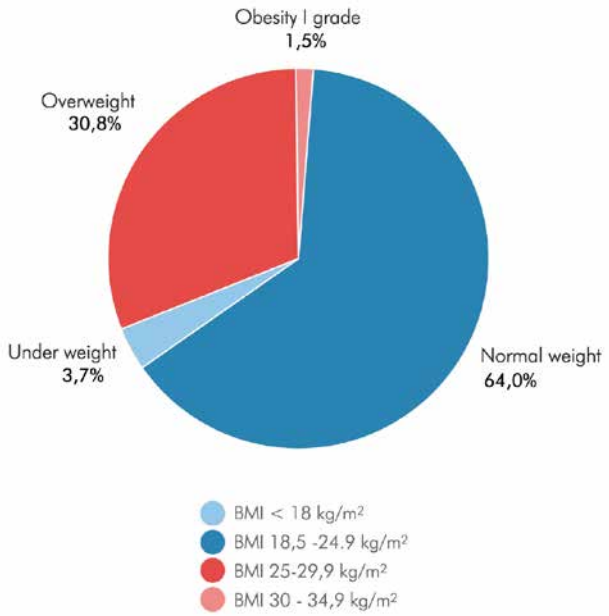


Fig. 2. Percentage representation of BMI in the studied population.



the sample studied 5 out of 10 subjects have abnormal blood pressure values.
From the data collected it was possible to make a diagnosis according to the 2018 ESC/ESH (European Society of Cardiology and European Society of Hypertension) Guidelines as shown in Table I.

Electrocardiogram

From the analysis of the data obtained from the instrumental examinations it is clear that 20% of the subjects (2 out of 10 subjects) have an electrocardiogram indicating a pathological alteration as represented in Figure 4.

Spirometry

Spirometry is the most common test to assess lung function. It is a particularly effective and widespread diagnostic tool as it is standardized, painless, easily reproducible and objective. Spirometry is frequently used in the diagnosis and evaluation of lung function in people with restrictive or obstructive airway diseases. The analysis of the data obtained shows that 14% of the population has an altered spirometry trace attributable to

Fig. 3. Representation of the prevalence of blood pressure values above the norm.

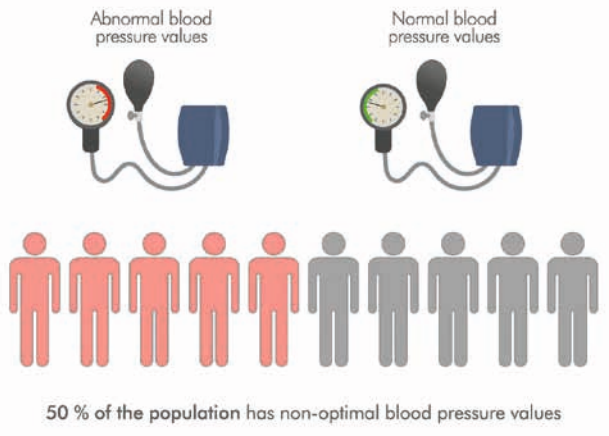
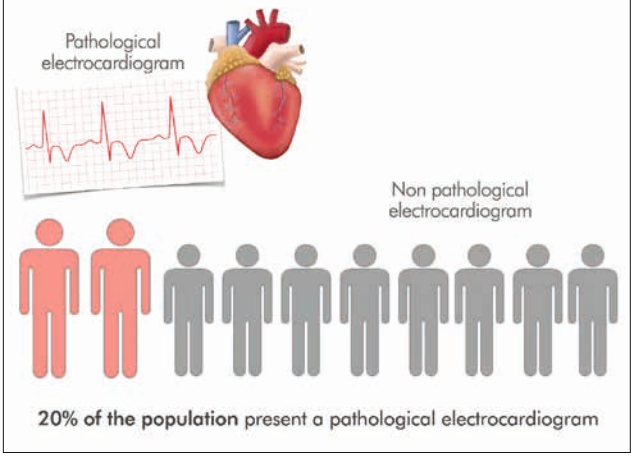


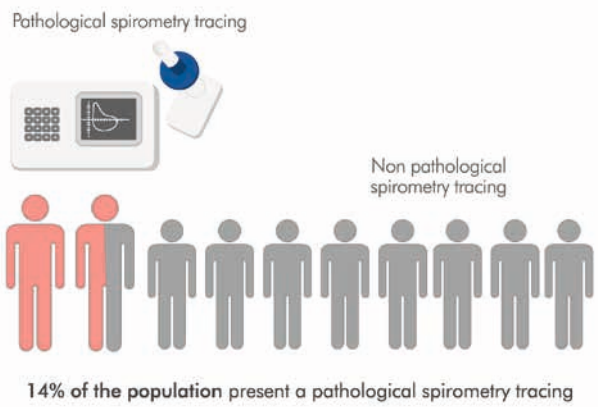
Fig. 4. Representation of the prevalence of pathological electrocardiogram in the sample studied.



Tab. I. SBP and DBP values classification.

Category	Reference values	N. of subjects	Systolic pressure (mmHg) Average ± SD	Diastolic pressure (mmHg) Average ± SD
Optimal	< 120 < 80	66	110 ± 5,0	70,4 ± 3,7
Normal	120-129 80-84	19	120,79 ± 1,8	80 ± 0
Normal - High	130-139 85-89	2	132,5 ± 3,5	87,5 ± 0,7
Grade 1 hypertension	140-159 90-99	15	142,5 ± 3,5	93,5 ± 4,9
Grade 2 hypertension	160-179 100-109	3	160	100
Isolated systolic hypertension	≥ 140 ≤ 90	30	148,72 ± 8,3	79,2 ± 6,0

Fig. 5. Representation of the prevalence of pathological spirometric trace in the studied sample.



a pathological state of a restrictive and instructive nature of the airways, as in Figure 5.

Statistical analysis and correlation

A special professional program of analysis and correlation of the data was used for the statistical analysis. A correlation between age, systolic blood pressure (SBP) and diastolic blood pressure (DBP) was made among subjects with a pathological electrocardiogram. Therefore, there is a significant correlation of increased blood pressure values with increasing age, consequently the cardiovascular risk is increased in the presence of multiple risk factors (abnormal electrocardiogram, arterial hypertension and advanced age) Figure 6.

Linking the body mass index with SBP emerges a positive correlation between increased systolic blood

Fig. 6. Correlation between age, SBP and DBP in subjects with pathological electrocardiogram.

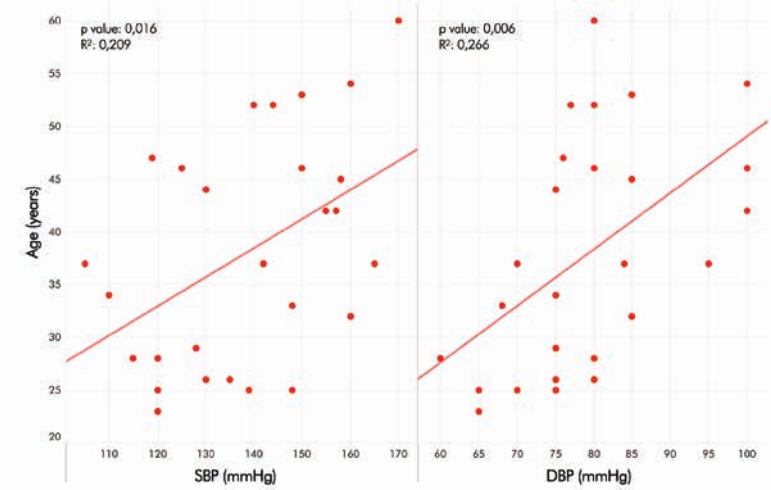
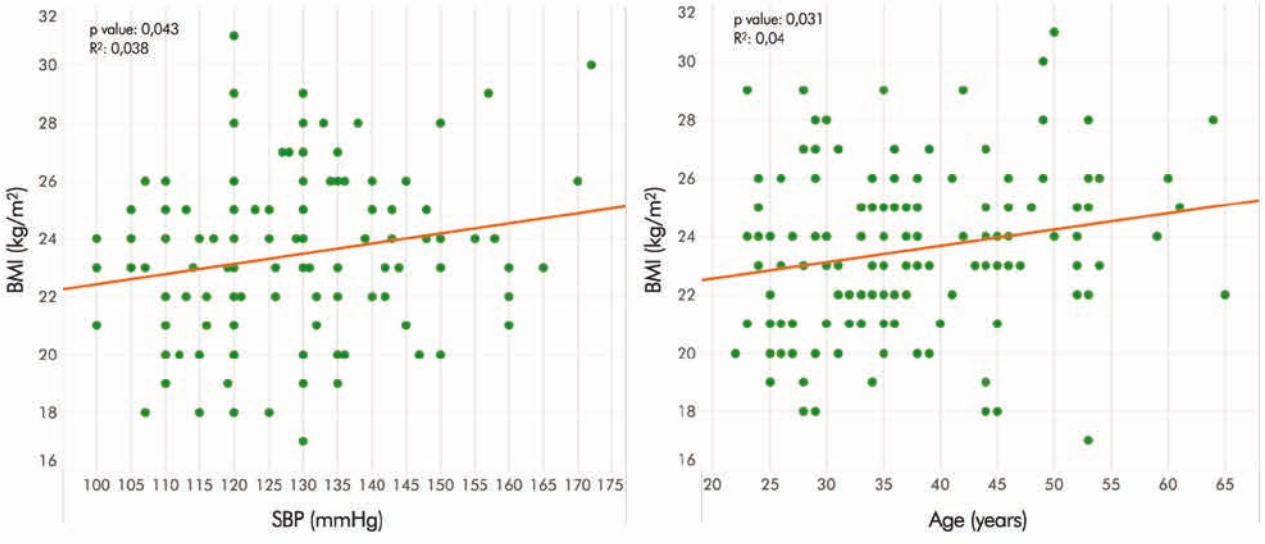


Fig. 7. Linear regressions between SBP and BMI and between BMI and age.



pressure and increased BMI, and the correlation between increased BMI and advancing age is significant (Fig. 7).

Discussion and Conclusion

The analysis of the collected clinical data shows a significant prevalence of arterial hypertension, cardiovascular diseases and pathological alterations of the respiratory system among foreign seasonal workers, despite the average age of the male population being relatively young (37.08 ± 9.8 years). The synergistic presence of risk factors – such as hypertension, cardiovascular and respiratory diseases – together with working determinants (incongruent postures, prolonged exposure to summer heat with temperatures above the seasonal average) determines a high risk for the health of the laborers employed in the tomato harvest in Southern Italy. To these factors are added obstacles to access to public health services, linked to language barriers, irregular legal status and discriminatory phenomena. These results are reflected in numerous international studies on similar populations. A recent meta-analysis conducted on Latino seasonal agricultural workers in the United States reported rates of hypertension ranging from 4% to 68% in males and between 1% to 54% in females, with significant prevalences also for diabetes, obesity and dyslipidemia [5]. Similarly, a study of 3,382 migrant workers in Oregon showed that prolonged stay (≥ 10 years) is associated with a higher risk of hypertension (OR 1.72; 95% CI 1.17-2.54) and obesity (22.8%) [6]. Even in Europe, comparative studies show a higher prevalence of cardiovascular risk factors in migrants compared to native populations, linked to precarious working conditions and difficulties in accessing care [8]. Data on thermal stress also confirm that exposure to high temperatures, particularly among migrants employed in outdoor work, can significantly increase cardiovascular mortality. For example, in contexts such as Qatar and Italy, more than 50% of deaths in the summer among migrant workers were attributable to cardiovascular diseases induced by heat [8]. Respiratory health is also compromised: an extensive review on exposures to agricultural dust and pesticides showed a clear association between agricultural work and acute and chronic respiratory diseases, with incidences between 20% and 35% depending on the context [9].

This study, on the one hand, lays the foundations for future public health and preventive medicine actions aimed at precision health surveillance, capable of monitoring, managing and reducing the risk of cardiovascular diseases among foreign workers; on the other hand, it highlights the urgent need to strengthen health protection interventions aimed at migrants. The strategic assessment of the state of health and the surveillance of diseases in seasonal workers therefore represent an essential cornerstone both for the protection of individual health and for the safeguarding of public health.

References

[1] Barbini N, Gorini G, Ferrucci L, Biggeri A. The role of professional activity in arterial hypertension. G Ital Med Lav Ergon 2007;29:174-81. https://doi.org/10.1701/263.3082.

[2] Krieger JW, Takaro TK, Song L, Beaudet NJ. Occupational health disparities among immigrant farmworkers in the United States: A review. Am J Ind Med 2018;61:587-95. https://doi.org/10.1002/ajim.22845.

[3] Antonicelli R, Abbatecola AM, Mazzarini G, Cardelli M, Gaetti R, Testa R, Spazzafumo L, Paciaroni E. Camerano study on hypertension: the problem of blood pressure variability during medical visit. Clin Exp Hypertens 1993;15:125-38. https://doi.org/10.3109/10641969309041614.

[4] World Health Organization. Health topics. Available at: https://www.who.int. Accessed on: 23 December 2025.

[5] Lopez-Cevallos DF, Garcia-Perez AS, Tellez M, Lee J, Mendez-Luck CA. Prevalence of Chronic Diseases Among Latino Migrant Seasonal Farmworkers: A Meta-analysis. J Immigr Minor Health 2024;26:145-56. https://doi.org/10.1007/s10903-024-01614-7.

[6] Garcia CM, Vasquez-Guzman CE, Sather AL, Elder JP. Cardiovascular Risk Among Long-Term Migrant Farmworkers in Oregon. Prev Med Rep 2023;34:102261. https://doi.org/https://doi.org/10.1016/j.pmedr.2023.102261.

[7] Rechel B, Mladovsky P, Devillé W, Szocska M, McKee M. Migration and health in the European Union. Maidenhead: Open University Press 2013. https://doi.org/10.1037/e579242013-001.

[8] Flouris AD, Ioannou LG, Friesen MC, Vicedo-Cabrera AM, Paullat F, Kenny GP, Nybo L. Heat Stress and Mortality Among Migrant Workers in Southern Europe and the Middle East. Environ Health Perspect 2024;132:027003. https://doi.org/10.1289/EHP13442.

[9] Alhassan M, Agbenyikey W, Arphul K, Adjei MO. Respiratory Health and Agricultural Dust Exposure: A Systematic Review. J Occup Environ Hyg 2021;18:201-15. https://doi.org/10.1080/15459624.2021.1910281.

Received on February 11, 2024. Accepted on December 23, 2025.

Correspondence: Domenico Basta, University of Bari Aldo Moro - Medical Health Area, FARBAS Basilicata Environment Research Foundation, Italy - Email: domenico.basta@uniba.it

How to cite this article: Basta D. Cardiovascular risk in seasonal migrant workers in Southern Italy: clinical-epidemiological evaluation. J Prev Med Hyg 2025;66:E630-E634. https://doi.org/10.15167/2421-4248/jpmh2025.66.4.3115