

# Higher education associated with reduced heart failure risk after myocardial infarction

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Higher education is associated with a reduced risk of developing heart failure after a heart attack, reports a study in more than 70 000 patients published today in the *European Journal of Preventive Cardiology*.

"Heart failure is a serious complication of acute myocardial infarction and substantially increases the risk of death," said lead author Dr Gerhard Sulo, a postdoctoral fellow at the University of Bergen in Norway.

He continued: "Previous research has shown that patients are more likely to die after a [heart attack](#) if they have a lower [educational level](#), but information on the mechanisms involved is sparse. Heart failure is the most important incident in the chain of events leading to death after a heart attack and we hypothesised that it might contribute to the observed educational disparities in survival."

The current study investigated the association between educational level and the risk of developing [heart failure](#) after an [acute myocardial infarction](#) (AMI). The study included 70 506 patients aged 35 to 85 years who had been hospitalised with a first (incident) AMI during 2001 to 2009 and did not have a history of heart failure. Patients were identified from the Cardiovascular Disease in Norway (CVDNOR) project, which contains data on all hospital stays with a cardiovascular disease-related diagnosis in Norway since 1994.2

Information on the highest attained [education](#) level was obtained from

the Norwegian National Education Database. Education was categorised as primary (up to 10 years of compulsory education), secondary (high school or vocational school), or tertiary education (college/university).

Patients were followed for an incident episode of heart failure until 31 December 2009. Based on its timing in relation to the incident AMI, heart failure was classified into two mutually exclusive categories; early-onset (heart failure on admission or developing during the hospitalisation for the incident AMI) and late-onset (either a new hospitalisation with heart failure or death due to heart failure after discharge from the incident AMI hospitalisation). Separate analyses were conducted for early and late-onset heart failure.

Of the 70 506 patients included in the analyses, 17.7% were diagnosed with early-onset heart failure. Patients with secondary or tertiary education had respectively 9% and 20% lower risk of heart failure compared to those with primary education.

Another 11.8% of patients were diagnosed with late-onset heart failure during an average follow up time of 3.4 years (interquartile range 1.5 to 5.9 years). Patients with secondary or tertiary education had respectively 14% and 27% lower risk of heart failure compared to patients with primary education.

When analyses were restricted to patients who received coronary revascularisation to clear blocked arteries after their AMI, those with secondary or tertiary education had respectively 16% and 33% lower risk of late-onset heart failure compared to those with primary education.

Educational differences in the risk of early-onset and late-onset heart failure were similar in men and women.

Dr Sulo said: "Education per se cannot be considered a 'protective exposure' in the classical sense but represents a clustering of characteristics that influence health behaviours and outcomes. It has been shown that patients with lower education tend to delay seeking medical care when heart attack symptoms occur and they have poorer access to specialised care. Both of these factors increase the risk of developing early-onset heart failure after AMI. Those with lower education are more likely to have coexisting medical conditions and unhealthy lifestyles which also increase the risk of heart failure."

He continued: "Patients with lower education are less likely to be prescribed medication after a heart attack to prevent heart failure, and they are also less likely to take their medication. This may explain the increased risk of late-onset heart failure."

Dr Sulo concluded: "Focused efforts are needed to ensure that heart attack [patients](#) with low education get help early, have equal access to treatment, take their medications, and are encouraged to improve their lifestyles. This should help reduce the socioeconomic gap in the risk of heart failure following a heart attack."

**More information:** Sulo G, Nygård, Vollset SE, Igland J, Ebbing M, Sulo E, Egeland GM, Tell GS. Higher education is associated with reduced risk of heart failure among patients with acute myocardial infarction: A nationwide analysis using data from the CVDNOR project. *European Journal of Preventive Cardiology*. [DOI: 10.1177/2047487316655910](#)

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