**Low income and work stress contribute to link between education, heart disease and stroke**

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Low educational levels predict an increased risk of developing or dying from heart disease and stroke according to the first nationwide study of the link between education and risk of cardiovascular disease.

The study, which is published in the European Heart Journal [1] today (Tuesday), is also the first nationwide study to look at the extent to which low income and work stress plays a role in the association between education and cardiovascular disease. It found that low income and work stress could explain between 21-54% of the increased risk of developing or dying from cardiovascular disease among people with and without cardiovascular or metabolic diseases at the start of the study.

Researchers led by Dr Elisabeth Framke at the National Research Centre for the Working Environment in Copenhagen, Denmark, analysed data from 1,638,270 Danish residents aged 30 to 59 in 2000 who did not have cardiovascular disease or diabetes at the start of the study. In addition, they looked at 41,944 people who had been diagnosed already with cardiometabolic disease, which includes heart disease and metabolic conditions such as diabetes. They followed them all until the end of 2014 to see who developed or died from these medical conditions.

Dr Framke said: “We found that among healthy individuals, those with a low educational level have a higher risk of developing cardiovascular disease than those with a high educational level. Among 10,000 men with low education, 61 would develop a cardiovascular disease within 12 months, whereas among 10,000 men with high education, only 34 would develop the disease within this time-frame. After taking some variables into account that could affect the results, such as age and migration background, this corresponds to a 1.62-fold higher risk among those with low education.

“Among women, the picture is similar, although working-age women have a much lower risk of cardiovascular disease than men. Among 10,000 women with low education, 32 would develop a cardiovascular disease within 12 months, whereas among 10,000 women with high education, only 16 would develop the disease within this time-frame. This corresponds to a 1.66-fold higher risk.”

The researchers also gathered information on annual disposable household incomes and “job strain”, which is a combination of the psychological demands of a job and the amount of control a person has over their work. A job with high job strain would be one where there are high psychological demands, but little control.

“When we took household income level and level of work stress, measured by the combination of high job demands and low job control, into consideration, the increased risk among those with low educational level lessened somewhat. We found a 1.46-fold higher risk among men and 1.53-fold higher risk among women,” said Dr Framke.

This means that adjusting for income and job strain reduced the risk by 25% for men and by 21% for women.

The researchers found a similar pattern when they looked at people who had cardiovascular disease or diabetes when the study started. Men and women with a low educational level had a 1.52-fold and 2.18-fold higher risk of dying of cardiovascular disease respectively than men and women with a high educational level. After adjusting for income and job strain, the risk was reduced to a 1.24-fold and 1.79-fold increased risk in men and women respectively – a reduction in risk of 54% in men and 33% in women.

“Our interpretation of these findings is that low income and high job strain may play a role in how low educational level affects the risk of developing or dying from cardiovascular disease, but that also a considerable part of this association is independent of income and job strain,” said Dr Framke.

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