

# An epidemiological approach to depression

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## Impact

### Introduction

In this thesis we assessed the associations of social network characteristics, different lifestyle factors (hourly patterns of physical activity (PA), cardiorespiratory fitness (CRF), and diet) and depression. Exploring the associations of these social and lifestyle factors with depression is of paramount importance, because new insights in this area may contribute in understanding the aetiology of the disease, as well as they may offer important inputs in treatment approaches, and in preventive strategies. Moreover, in light of the high burden of depression, assessing the role of these social and lifestyle factors may largely contribute to public health, not only of health care system as well as reduce public costs. In this section we discuss the application of the main findings of this dissertation focusing on associations of several social network characteristics and lifestyle factors with prevalent and incident depression.

### Most important results and conclusions

The social network characteristics, less emotional support and having a lower proportion of family members, were associated with prevalent and incident depressive symptoms. As family members are a major source of emotional support, strengthening these social network characteristics may be important in preventing and treating depression. In particular, social networks may influence individuals' lifestyle and self-management impacting on self-care management, prevention of complications, or even recurrency in chronic disease(s), such as depression. Furthermore, a good quality of network (more support, more engagement and larger network) might help individuals in maintaining a healthy lifestyle. Indeed, a higher amount of PA is associated with lower risk of depression (1) as also confirmed in this thesis. Individuals with both prevalent and incident depressive symptoms were significantly more sedentary, particularly during the afternoon and evening. Less PA throughout the day, especially light intensity physical activity (LiPA) and to a lesser extent MVPA during the morning, early afternoon, and evening was associated with prevalent and incident depressive symptoms. Promoting LiPA, throughout the day may reduce the burden of depressive symptoms which may be easier to achieve compared to MVPA, and may be more applicable in an elderly population (both with or without chronic diseases or mobility limitation). PA is one of the factors impacting on cardiorespiratory fitness (CRF) (2) and a higher CRF was associated with a lower risk of incident depressive symptoms with a 50% reduced risk when individuals with low CRF were compared with those with moderate-to-high CRF. Since CRF can be considered a measure of lifetime PA exposure, promoting PA can be a good public health strategy for preventing depression. Lastly, also diet showed an important association with depression (3-5), both in our umbrella review and in the Maastricht Study, for instance a higher adherence to the Dutch Healthy Diet was associated with lower risk of incident depressive symptoms. All the aforementioned

factors may be influenced by relatively inexpensive non-pharmacological strategies in order to reducing the high burden of depression in our society.

### **Scientific and social relevance**

Results obtained in the current thesis can have important impact on science. Indeed, we explored several potential risk/protective factors associated with depression that can inform future research and help researchers in using our approach. The latter will improve the comparability of results and in long terms the possibility to perform a meta-analysis, not yet possible (6). Lastly, results of this thesis can create the basis for understanding the consequences of some lifestyle factors both in short and long term. Moreover, our results highlighted that healthier lifestyle does not only have a positive effect on physical health, but also mental health.

In the previous section, we already mentioned the high burden of depression, however, our society is currently facing another challenge: the increasing aging of the population. Both these two phenomena concur in the burden and cost related to depression. Indeed, major depression affects 4-7% of elderly and 6-30% experience depressive symptoms (7-9). In terms of costs, approximately 118 billion euro, in Europe, are spent on depression care (42 billion due to direct cost and 76 billion euro are allocated for indirect cost), making depression one of the most costly mental disorders (10). From a public health perspective, dealing with this disease means put efforts in reducing both prevalence (improving treatment approaches) and incidence (preventing the onset of new cases) of depression. Therefore, in order to achieve a most impactful results, it is important to act at population level, instead of on a single individual or small group of people.

Health education alone may not be sufficient in order to create a culture of being more physical active and less sedentary, eating healthier and having a more supportive social network. Indeed, promoting strategies and policies able to daily integrate these “healthy choices” may highly impact on population health. For example, implementing more cycle and pedestrian path can implement a more positive environment that in turn may promote PA, or allowing leave from work or agile working can help people to take care about their own and their social network/relationships. Lastly, lifestyle factors assessed may jointly concur in reducing the burden of depression. In fact, being more physically active and less sedentary is related with higher CRF, which in itself is associated with lower risk of depression (11, 12). Moreover, it has been proven that adopting a healthy lifestyle is often combined with other health related habits as for instance being physical active is often combined with a healthy diet, in turn associated with lower depressive symptoms (13, 14). Lastly, it should be considered that social support is important to adopt and succeed with lifestyle changes, besides, as demonstrated being associated with depression in itself.

To conclude, results of this thesis provide tools for future studies investigating the implementation of these public health policies for the public domain and specific target populations.

### **Target audience**

Results of the current dissertation can also be of value for policy makers, health care professionals and obviously for general public (particularly middle-aged and early old age adults). Our results can be relevant for policy makers because they offer insights that can inform public policies and strategies in both treatment and prevention. In fact, better knowing potential risk factors is important for implementing preventive strategies. At the same time, our results can be used by health care professionals in their clinical practice in several ways. First, they can benefit from the new insights in the association between social network characteristics and lifestyle and depression. In fact, our results draw attention to some factors that usually are not integrated in normal care as for instance social network characteristics. Therefore, assessing social network characteristics will make identification individuals at higher risk of depression easier. Consequently, clinical practitioners can proactively inform people on how to manage their social network. In addition, our results are important for the general public because of the potential beneficial effect of social network characteristics and lifestyle factors on the risk of depression. In light of this, health education campaigns aimed at increasing the general public's knowledge and altering their behaviour in these areas could not only reduce the risk of lifestyle diseases such as cardiovascular diseases and cancer but can also reduce the risk of depression and thus improve mental health in general.

### **Target group involvement**

All studies of the current thesis, except the umbrella review, were based upon data of The Maastricht Study, an observational study conducted on individuals aged 40-75 years and living in the southern part of the Netherlands, which allows us to have a direct connection with a large segment of the general population in South-Limburg. In fact, in The Maastricht Study, translation in layman terms of the results of research among participants is actively promoted. Results are made available to participants and disseminated by newsletters, moreover, an annual symposium, freely accessible is organized for all the participants. Nowadays, the wide spread of internet, also among adults and older adults, can encourage the use of social media platform as Facebook, Twitter or others to engage a larger audience, also among those not participating in the study. Lastly, traditional media may also contribute in dissemination of scientific results. However, challenging issues are related to the communication of scientific results to the public. For examples, translating scientific research in layman terms should be done combining both the scientific rigor with the need of being understandable. Moreover, scientists should be also able to advocate policy makers in order to promote informed healthy policies.

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