Author's response to reviews

**Title:** Type D personality is associated with impaired psychological status and unhealthy lifestyle in Icelandic cardiac patients: A cross-sectional study.

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**Author's response to reviews:** see over
Dear Mr. Aldcroft,

Thank you for considering our paper for publication at the BMC Public Health. Please find enclosed a revised version of the manuscript titled: “Type D personality is associated with impaired psychological status and unhealthy lifestyle in Icelandic cardiac patients: A cross-sectional study”, with manuscript number MS: 1519068712443253. Our reply to the reviewers comment is included at the end of this letter.

We are very pleased to get the opportunity to improve our manuscript further. We hope that this revised version of our manuscript now meets the high standards of BMC Public Health and look forward to learning of your decision in relation to our manuscript.

Yours sincerely,

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**Reviewers comment:**

The authors have done an excellent job assessing all but 1 of my earlier points, and as a result the manuscript is tighter now. 1 concern lingers: the authors argue that a strictly categorical approach is warranted based on its compatibly with diagnostic categories in medicine. I am very sympathetic to such a typological approach, and they have even cited one of my previous papers calling for a rapprochement between type and trait approaches in personality and health research.

However, the critical point of that paper was that categorical and dimensional approaches provide complementary information, not that categorical approaches should be elevated to the point of not even considering dimensional/trait approaches in secondary analysis. Therefore, I am puzzled by the reluctance to even conduct a secondary analysis using the Type D continuum. No possible harm could come of it, and it will provide readers with a sense of the fully powered personality-outcome associations. If there is indeed no linear effect but instead a threshold one, this even suggests the type approach is particularly warranted. I am thus left perplexed by the authors' apparent reluctance to even examine the continuous Type D score.

**Response:** First of all, we would like to thank the reviewer for this important comment, and his excellent and useful comments in the last revision, which helped improve the manuscript considerably. Now, the categorization versus dimensional approach to Type D personality has received considerable attention recently. We believe, as we stated in the previous response letter, that both dimensional and categorical approaches in personality research have their value. In the last revision we kept to the categorical approach, as we considered the results to be valid and informative in their own right, especially as the focus was to in identify a group of patients at a higher risk of adverse psychological well-being and health-behaviors. The reviewer is right, however, when stating that nothing is lost with adding secondary analyses with continuous scores, and we recognize that these analyses can give added value to the paper as regards providing better understanding of the Type D construct and personality-outcome associations in general. We have therefore now added secondary analyses to the manuscript, where the Type D categorizations has been substituted with continuous Type D scale scores.
These changes include the following:

**Method section:** “Finally, a re-analysis was conducted for all significant associations where the Type D/non-Type D categorization (≥10 on NA and SI) was substituted with continuous NA and SI scale scores [39]. Inter-quartile ranges were used to rescale NA and SI scores and the NA by SI interaction term, so that a one unit difference represented a clinically relevant metric. Within these NA inter-quartile distribution, 70% (N=49) of Type Ds fell within the 4th quartile, and 30% (N=21) within the 3rd quartile. For SI 49% (N=34) of Type Ds fell within the 4th quartile and 51% (N=36) within the 3rd quartile. In the inter-quartile NA by SI scores, 89% (N=62) of Type Ds were within the 4th quartile and 11% (N=8) within the 3rd quartile. Linear regression models anxiety, depression, and stress were re-executed, with NA, SI and the NA by SI interaction term entered at the first step and covariates at the second. For health-related risk markers, binary logistic regression analyses (stepwise procedure) were used with NA, SI and the NA by SI as predictors.” (Pg. 11).

**Results section:** “Secondary analysis of significant results using re-scaled Type D scale scores. NA was a significant predictor for anxiety (b=0.65, p<0.001), depression (b=0.30, p=0.006), and stress (b=0.36, p=0.001), and SI was a significant for depression (b=0.25, p=0.009). After adjustment for these NA and SI main effects, the interaction term of NA by SI was not significant in these analyses of anxiety, depression and stress. In binary logistic regression models of health-related risk markers, the NA by SI interaction term was associated with higher odds of smoking at follow-up (OR 1.50, 95% CI: 1.01-2.21, p=0.04) and less fish consumption (OR 0.48, 95% CI: 0.31-0.74, p=0.001), and NA with more use of antidepressant medications (OR 1.89, 95% CI: 1.29-2.77, p= 0.001). No association was found between NA, SI, or NA by SI with weight gain (in patients with BMI ≥25) or use of sleep medication.” (Pg.14).

**Discussion section:** “Re-analyses of significant associations of Type D personality with outcome variables, using continuous NA, SI, and NA by SI scores confirmed the association of the NA and SI subscales with depression, and the main effects of NA with anxiety and stress. The NA by SI interaction term was not significant in these analyses, probably as the main effects of the Type D subcomponents were already accounted for. Regarding health-behaviors, the NA by SI interaction term was associated with more smoking and lower-fish consumption, and NA with use of antidepressant medications. These findings suggest that categorical and dimensional definitions of Type D personality are not necessarily mutually exclusive, but represent two different ways of capturing the psychological profiles of individuals [45].” (Pg.16)

All changes made to the paper, concerning both these secondary analyses and other minor adjustments, are marked with red font-color in the manuscript.