Inaccurate data in meta-analysis; ‘A posteriori’ dietary patterns and metabolic syndrome in adults: a systematic review and meta-analysis of observational studies

Madam

We read with interest the meta-analysis by Shab-Bidar et al. on the association of ‘a posteriori’ dietary patterns (DP) and metabolic syndrome. We noticed several inaccuracies regarding the inclusion of data that need to be clarified. The authors declare that the meta-analysis was conducted with articles published up to July 2015, but many articles meeting the inclusion criteria were not selected and included in the study. We found that the food composition of the DP included in the meta-analysis was not always reflected in the frequency of consumed foods characterizing the categories ‘Unhealthy/Western’ and ‘Healthy/Prudent’ investigated by the authors. They classified and analysed together as ‘Healthy/Prudent’, DP whose composition differed considerably, as described in the studies by Suliga et al., Akter et al., Hong et al., Kim and Jo, and DiBello et al. Similarly, for the analysis of the ‘Unhealthy/Western’ pattern, they combined different DP described in the studies by Gadgil et al., Hong et al., Kim and Jo, DiBello et al., Noel et al. and Esmaillzadeh et al. Therefore, the combination of these risk estimations seems methodologically incorrect. We summarize the misclassified DP included in the ‘Unhealthy/Western’ and ‘Healthy/Prudent’ patterns in Table 1.

In addition, we noticed some inconsistencies regarding the risk data included in the meta-analysis. The most evident inaccuracies in the risk data for the ‘Unhealthy/Western’ pattern are the following: (i) study by Gadgil et al., ‘Animal protein’ DP, OR = 0.69 (95% CI 0.65, 1.10) instead of OR = 0.69 (95% CI 0.43, 1.10); and (ii) study by Suliga et al., ‘Fat, meat and alcohol’ DP, OR = 1.22 (95% CI 0.97, 1.53) instead of the risk estimate of the adjusted model OR = 1.04 (95% CI 0.82, 1.33). The inaccuracies in the risk data for ‘Healthy/Prudent’ pattern regard the following risk estimations: (i) study by Gadgil et al., ‘Fruits, vegetables, nuts, and legumes’ DP, OR = 0.58 (95% CI 0.50, 0.91) instead of the adjusted model OR = 0.58 (95% CI 0.43, 0.91). We summarize the misclassified DP included in the meta-analysis.

Table 1. Summary and composition of the misclassified dietary patterns (DP) included in the meta-analysis

<table>
<thead>
<tr>
<th>Authors, year, reference</th>
<th>Description of DP included in the ‘Western/Unhealthy’ DP</th>
<th>Description of DP included in the ‘Healthy/Prudent’ DP</th>
<th>DP excluded from the meta-analysis</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Gadgil et al., 2015(12)</td>
<td>‘Animal protein’: poultry, red meat, eggs, fish</td>
<td>3. ‘Fruits, vegetables, nuts, and legumes’: fruit, legumes, nuts, vegetables, vegetables oil</td>
<td>–</td>
<td>The ‘Fried snacks, sweets, and high-fat dairy’ DP should be excluded from the meta-analysis</td>
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<td>Suliga et al., 2015(7)</td>
<td>‘Fat, meat and alcohol’: lard, red meat, cold cured meat, eggs, fried dishes, vegetable oils, mayonnaise and alcoholic drinks</td>
<td>1. ‘Healthy’: fruit and vegetables, low-fat milk and dairy products, whole grain foods</td>
<td>4. ‘Coca cola, hard cheese and French fries’: coca cola, hard cheese and French fries</td>
<td>The ‘Prudent’ DP should be excluded from the meta-analysis</td>
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<td>Akter et al., 2013(8)</td>
<td>‘Animal food’: fish and shellfish, meat, processed meat, mayonnaise and egg</td>
<td>1. ‘Healthy Japanese’: vegetables, fruits, soya products, mushrooms, green tea</td>
<td>–</td>
<td>The ‘Westernized breakfast’ DP should be excluded from the meta-analysis</td>
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</tbody>
</table>
The composition of the DP should be excluded from the meta-analysis

**Table 1** Continued

<table>
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<th>Authors, year, reference</th>
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<td>Hong et al., 2012(9)</td>
<td>2. ‘Alcohol and meat’: processed meats, eggs, fish paste, animal fat and alcohol, plus meat and fast foods 3. ‘Sweets and fast foods’: fruit juices, chocolate, ice cream, pizza and hamburgers</td>
<td>1. ‘Korean traditional’: refined and whole grains, Korean seasonings, onions and garlic, vegetable oil, soy products, starch syrup and sugar 4. ‘Fruit and dairy’: fruits and dairy products, rice cakes and nuts</td>
<td>–</td>
<td>The ‘Korean traditional’ and ‘Sweets and fast foods’ DP should be excluded from the meta-analysis</td>
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<td>Kim and Jo, 2011(10)</td>
<td>2. ‘Meat and alcohol’: noodles and dumplings, meat and its products, alcohol 3. ‘High fat, sweets, and coffee’: sugar and sweet snacks, eggs, oils, coffee</td>
<td>1. ‘White rice and kimchi’: white rice, kimchi, vegetables 4. ‘Grains, vegetables, and fish’: grains, nuts, vegetables, fish and shellfish, seasonings</td>
<td>–</td>
<td>The ‘White rice and kimchi’ and ‘High fat, sweets, and coffee’ DP should be excluded from the meta-analysis</td>
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<td>DiBello et al., 2009(11)</td>
<td>2. ‘Factor 2’: meat and coconut products such as coconut cream dishes and lamb 3. ‘Factor 3’: meat and coconut products such as coconut cream dishes and lamb</td>
<td>1. ‘Neo-traditional’: crab and lobster, fish, coconut cream dishes, papaya soup, coconut milk, papaya and taro 3. ‘Modern’: sausage, eggs, milk, cheese, coconut cream, rice, instant noodle soup, bread, pancakes, cereal, butter/margarine, cake and potato chips</td>
<td>–</td>
<td>The composition of the DP described in the article by DiBello et al. differs consistently from the composition of the DP described in the other published articles. The combination of the risk estimates referring to these DP seems inappropriate</td>
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<td>Noel et al., 2009(13)</td>
<td>1. ‘Meat and French fries’: meat, processed meat, French fries, pizza and Mexican foods, eggs, alcohol, and other grains and pasta 2. ‘Traditional’: beans and legumes, rice, oil, vegetables</td>
<td>3. ‘Sweets’: candy, sugar and chocolate candy, soft drinks, sugary beverages, sweet baked goods, dairy desserts and salty snacks</td>
<td>–</td>
<td>The ‘Traditional’ dietary pattern should be considered as ‘Healthy/Prudent’ dietary pattern</td>
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<td>Esmailzadeh et al., 2007(14)</td>
<td>2. ‘Western’: refined grains, red meat, butter, processed meat, high-fat dairy products, sweets and desserts, pizza, potatoes, eggs, hydrogenated fats and soft drinks 3. ‘Traditional’: refined grains, potatoes, tea, whole grains, hydrogenated fats, legumes and broth</td>
<td>1. ‘Healthy’: fruits, tomatoes, poultry, legumes, cruciferous and green leafy vegetables, other vegetables, tea, fruit juices and whole grains</td>
<td>–</td>
<td>The ‘Traditional’ dietary pattern should be excluded from the meta-analysis</td>
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In summary, since the dietary patterns represent a complex variable reflecting specific combination of different foods which varies consistently among the studies, we believe that pooling dietary patterns on the basis of factor loadings and combining risk data referring to similar dietary patterns are essential to obtain consistent and solid...
evidence on the association between diet and health-related outcomes as expected in a meta-analysis.

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References


