**Supplementary material (appendix describing the search process)**

**Appendix table 1 –** Search strategies according to different databases (7th January, 2020)

|  |  |  |
| --- | --- | --- |
| ***Databases*** | ***Search strategies*** | ***Results*** |
| PubMed *via* MedLine | (("microbiota"[MeSH Terms] OR "microbiota"[All Fields]) OR ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR "microbiotas"[All Fields]) OR "Microbial Community"[All Fields] OR "Community, Microbial"[All Fields] OR "Microbial Communities"[All Fields] OR "Microbial Community Composition"[All Fields] OR ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("community"[All Fields] AND "composition"[All Fields] AND "microbial"[All Fields])) OR ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("composition"[All Fields] AND "microbial"[All Fields] AND "community"[All Fields])) OR "Microbial Community Compositions"[All Fields] OR "Microbial Community Structure"[All Fields] OR ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("community"[All Fields] AND "structure"[All Fields] AND "microbial"[All Fields])) OR "Microbial Community Structures"[All Fields] OR "Microbiome"[All Fields] OR "Microbiomes"[All Fields]) AND ("Human OR "[All Fields] AND ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("human"[All Fields] AND "microbiome"[All Fields]) OR "human microbiome"[All Fields]) AND "OR "[All Fields] AND ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("human"[All Fields] AND "microbiomes"[All Fields]) OR "human microbiomes"[All Fields]) AND "OR "[All Fields] AND ("microbiota"[MeSH Terms] OR "microbiota"[All Fields] OR ("microbiome"[All Fields] AND "human"[All Fields])) AND "OR "[All Fields] AND ("Gut"[Journal] OR "gut"[All Fields]) AND (("mouth"[MeSH Terms] OR "mouth"[All Fields] OR "oral"[All Fields]) AND ("dental health services"[MeSH Terms] OR ("dental"[All Fields] AND "health"[All Fields] AND "services"[All Fields]) OR "dental health services"[All Fields] OR "dental"[All Fields]) AND ("skin"[MeSH Terms] OR "skin"[All Fields]))  AND  (("minority groups"[MeSH Terms] OR ("minority"[All Fields] AND "groups"[All Fields]) OR "minority groups"[All Fields] OR "minority"[All Fields]) AND species[All Fields]) AND Title/Abstract[All Fields] AND (low[All Fields] AND abundance[All Fields]) AND Title/Abstract[All Fields] AND (("minority groups"[MeSH Terms] OR ("minority"[All Fields] AND "groups"[All Fields]) OR "minority groups"[All Fields] OR "minority"[All Fields]) AND phylum[Title/Abstract]) OR keystone[Title/Abstract]) | 245 |

|  |  |  |
| --- | --- | --- |
| Cochrane | (Microbiota OR Microbiotas OR “Microbial Community” OR “Community, Microbial” OR “Microbial Communities” OR “Microbial Community Composition” OR “Community Composition, Microbial” OR “Composition, Microbial Community” OR “Microbial Community Compositions” OR “Microbial Community Structure” OR “Community Structure, Microbial” OR “Microbial Community Structures” OR “Microbiome” OR “Microbiomes” OR “Human Microbiome” OR “Human Microbiomes” OR “Microbiome, Human”) in Title, Abstract and Keyword AND (“minority species” OR "low abundance" OR “minority phylum” OR keystone) in Title, Abstract and Keyword | 14 trials |
| Livivo | (Microbiota OR Microbiotas OR “Microbial Community” OR “Community, Microbial” OR “Microbial Communities” OR “Microbial Community Composition” OR “Community Composition, Microbial” OR “Composition, Microbial Community” OR “Microbial Community Compositions” OR “Microbial Community Structure” OR “Community Structure, Microbial” OR “Microbial Community Structures” OR “Microbiome” OR “Microbiomes” OR “Human Microbiome” OR “Human Microbiomes” OR “Microbiome, Human”) in Keyword AND (“minority species” OR "low abundance" OR “minority phylum” OR keystone) in Keyword - (removing the MedLine database) | 459 |
| Web of Science | TÓPICO: (((microbiota OR microbiotas OR "Microbial Community" OR "Community, Microbial" OR "Microbial Communities" OR "Microbial Community Composition" OR "Community Composition, Microbial" OR "Composition, Microbial Community" OR "Microbial Community Compositions" OR "Microbial Community Structure" OR "Community Structure, Microbial" OR "Microbial Community Structures" OR "Microbiome" OR "Microbiomes") AND (“Human” OR "Human Microbiome" OR "Human Microbiomes" OR "Microbiome, Human" OR “gut” OR oral OR dental OR skin))) AND TÓPICO: (("minority species" OR "low abundance" OR "minority phylum" OR keystone OR keystones)) | 285 |
| Scopus | TITLE-ABS-KEY((microbiota OR microbiotas OR "Microbial Community" OR "Community, Microbial" OR "Microbial Communities" OR "Microbial Community Composition" OR "Community Composition, Microbial" OR "Composition, Microbial Community" OR "Microbial Community Compositions" OR "Microbial Community Structure" OR "Community Structure, Microbial" OR "Microbial Community Structures" OR "Microbiome" OR "Microbiomes") AND (“Human” OR "Human Microbiome" OR "Human Microbiomes" OR "Microbiome, Human" OR “gut” OR oral OR dental OR skin)) AND TITLE-ABS-KEY("minority species" OR "low abundance" OR "minority phylum" OR keystone OR keystones) | 361 |
| ***Additional Grey Literature*** | ***Search strategies*** |  |
| Google Scholar | (“human Microbiota OR “Human Microbiome” OR “Microbiome” OR “Microbial Communities”) AND (“minority species” OR "low abundance" OR “minority phylum” OR keystone) | 13 |
| Open Grey | (Microbiota OR Microbiotas OR “Microbial Community” OR “Community, Microbial” OR “Microbial Communities” OR “Microbial Community Composition” OR “Community Composition, Microbial” OR “Composition, Microbial Community” OR “Microbial Community Compositions” OR “Microbial Community Structure” OR “Community Structure, Microbial” OR “Microbial Community Structures” OR “Microbiome” OR “Microbiomes” OR “Human Microbiome” OR “Human Microbiomes” OR “Microbiome, Human”) AND (“minority species” OR "low abundance" OR “minority phylum” OR keystone) | 2 |

**Appendix table 2.** Excluded studies and reasons for exclusion (n=25).

|  |  |
| --- | --- |
| **Author, year** | **Reason for exclusion** |
| Ana, E. et. al (2011) | 2 |
| Andersen, L. O. et. al (2016) | 2 |
| Cucchiara, S. et. al (2009) | 4 |
| Cummings, L. A. et. al (2016) | 5 |
| Diaz, P. I. (2012) | 4 |
| Dicksved et al. (2009) | 2 |
| El Kaoutari, A. et. al (2013) | 2 |
| Fu, B. C. et. al (2019) | 3 |
| Gotoh, A. et. al (2019) | 2 |
| Han, Y. et. al (2019) | 1 |
| Kawamura, Y. and Kamiya, Y. (2012) | 2 |
| Khemwong, T.et. al (2019) | 2 |
| Lawley, B. et. al (2017) | 2 |
| Li, M. and et. al (2018) | 2 |
| Liu, J. M. et. al (2013) | 6 |
| Lugli, G. A. et. al (2019) | 5 |
| Maldonado-Contreras, A. et. al (2011) | 2 |
| Mazzini, L. et. al (2017) | 3 |
| Reimers et al. (2016) | 3 |
| Rossen, N. G. et. al (2015) | 2 |
| Peterson et al. (2013) | 3 |
| Sousa, V. et. al (2017) | 3 |
| Trent, M. et. al (2019) | 3 |
| Tunney, M. M. et. al (2013) | 3 |
| Typpo, K. et. al (2016) | 7 |

1.Studies did not apply NGS methods (n=11); 2. Interventional designs (n=7); 3. Literature review (n=2); 4. Studies with no human sample (n= 2); 5. *In vitro* studies (n=1); 6. Studies written in non-Latin alphabet (n = 1); 7.Conference abstract (n=1)

**APPENDIX 2 REFERENCES**

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