

Annex 1. Quality assessment through Mixed Methodology Appraisal Tool (MMAT)

Qualitative papers						
Author(s)	Is the qualitative approach appropriate to answer the research question?	Are the qualitative data collection methods adequate to address the research question?	Are the findings adequately derived from the data?	Is the interpretation of results sufficiently substantiated by data?	Is there coherence between qualitative data sources, collection, analysis and interpretation?	Overall quality
Siaw et al. (2023)	Yes	Yes	Yes	Yes	Yes	High
Alho et al. (2021)	Yes	Yes	Yes	Yes	Yes	High
Cosimo et al. (2024)	Yes	Yes	Yes	Yes	Yes	High
Dompreh et al. (2023)	Yes	Yes	Yes	Yes	Yes	High
Gboko et al. (2021)	Yes	Yes	Yes	Yes	Yes	High
Jacobi et al. (2022)	Yes	Yes	Yes	Yes	Yes	High
Krauss et al. (2020)	Yes	Yes	Yes	Yes	Yes	High
Quantitative non-randomized papers						
Author(s)	Is the research question/objective well defined?	Is the methodology appropriate?	Is the data collection and analysis complete?	Are discussion and conclusions appropriate?	Is the study relevant to the research field?	Overall quality
Knöblsdorfer et al. (2021)	Yes	Yes	Yes	Yes	Yes	High
Iddrisu et al. (2020)	Yes	Yes	Yes	Yes	Yes	High

Sellare et al. (2020)	Yes	Yes	Yes	Yes	Yes	High
Meemken et al. (2019)	Yes	Yes	Yes	Partially	Yes	High
Ankuyi et al. (2023)	Yes	Yes	Yes	Yes	Yes	High
Sadeu et al. (2023)	Partially	Yes	Yes	Yes	Yes	High
Dompfeh et al. (2021)	Yes	Yes	Yes	Yes	Yes	High
Aidoo et al. (2014)	Yes	Yes	Yes	Yes	Yes	High
Agbotui et al. (2024)	Yes	Yes	Yes	Partially	Yes	High
Dröge et al. (2024)	Yes	Yes	Not applicable	Yes	Yes	High
Dröge et al. (2025)	Partially	Yes	Yes	Partially	Yes	High
Mahrizal et al. (2012)	Partially	Yes	Yes	Not applicable	Yes	High
Quantitative descriptive papers						
Author(s)	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?	Overall quality
Lescuyer et al. (2021)	Yes	No	Yes	Not applicable	Yes	Intermediate
Krumbiegel et al. (2024)	Yes	Yes	Yes	Not applicable	Yes	High
Famuyiwa et al. (2017)	Yes	Partially	Yes	Yes	Yes	High
Gockowski et al. (2023)	Partially	Partially	Yes	Not applicable	Yes	Intermediate

Miglietta et al. (2021)	Yes	No	Yes	Not applicable	Yes	Intermediate
Garbely et al. (2022)	Yes	Yes	Yes	Not applicable	Not applicable	High
Shillie et al. (2024)	Yes	Yes	Yes	Not applicable	Yes	High
Mixed-methods papers						
Author(s)	Is there an adequate rationale for using a mixed methods design to address the research question?	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	Overall quality
Jouvin (2021)	Yes	Yes	Yes	Not applicable	Yes	High
Sellare (2022)	Yes	Partially	Yes	Not applicable	Yes	High
Chavez et al. (2019)	Partially	Yes	Yes	Not applicable	Yes	High
Wollni et al. (2024)	Yes	Yes	Yes	Partially	Yes	High
Thompson et al. (2022)	Yes	Yes	Yes	Partially	Yes	High
Jacobi et al. (2013)	Yes	Yes	Yes	Partially	Yes	High
Watzold et al. (2025)	Yes	Yes	Yes	Partially	Yes	High
Ansah E.O. (2019)	Yes	Yes	Yes	Partially	Yes	High
Essougong et al. (2023)	Yes	Yes	Yes	Partially	Yes	High
Lemeilleur et al. (2015)	Yes	Yes	Partially	No	Yes	Intermediate

van der Ven et al. (2018)	Yes	No	No	Not applicable	Yes	Intermediate
Shillie et al. (2024)	Yes	Partially	No	No	Yes	Low
Ingram et al. (2018)	Yes	Yes	Yes	Partially	Yes	High
Other papers						
Author(s)	Is the research question or objective clear?	Is the methodology appropriate?	Was data collection and analysis complete?	Were the discussion and conclusions complete?	Did the paper provide relevant insights for the field?	Overall quality
Tscharntke et al. (2014)	Yes	Yes	Partially	Yes	Yes	High
Milder et al. (2024)	Yes	Yes	Partially	Yes	Yes	High
Ruben (2017)	Yes	Yes	Partially	Yes	Yes	High
Byerlee et al. (2015)	Yes	Yes	No	Yes	Yes	High
Leimona et al. (2024)	Yes	Yes	No	Yes	Yes	High

Note: The final group of studies, referred to as “Other papers,” did not align with any of the predefined MMAT categories. As a result, five tailored quality assessment criteria were developed specifically for this review to ensure a consistent and rigorous appraisal of their methodological quality.