

SUPPLEMENTARY FILE 2

Complete Search Strategies for Systematic Review

Title: Burden of Epstein-Barr Virus in Gastric Cancer, Nasopharyngeal Carcinoma, and Burkitt Lymphoma in Africa

Search Date: March 31, 2025

Date Range: January 1, 2000 – March 31, 2025

Table 1. Database Search Results Summary

Database	Results (n)	Date Searched
PubMed	789	March 31, 2025
Scopus	312	March 31, 2025
Web of Science	118	March 31, 2025
African Journals Online (AJOL)	28	March 31, 2025
Total before deduplication	1,247	
Total after deduplication	835	

Table 2. PubMed Search Strategy

Parameter	Details
Database	PubMed (https://pubmed.ncbi.nlm.nih.gov/)
Search Date	March 31, 2025
Date Range	January 1, 2000 – March 31, 2025
Line	Search Query
1	"Epstein-Barr Virus"[MeSH] OR "Herpesvirus 4, Human"[MeSH] "EBV"[tiab] OR "Epstein-Barr virus"[tiab] OR "Epstein Barr virus"[tiab] "human herpesvirus 4"[tiab] OR "human herpesvirus-4"[tiab] OR "HHV-4"[tiab] OR "HHV4"[tiab] "herpes virus 4"[tiab] OR "gammaherpesvirus 4"[tiab]
2	"Nasopharyngeal Carcinoma"[MeSH] OR "Nasopharyngeal Neoplasms"[MeSH] "Stomach Neoplasms"[MeSH] OR "Burkitt Lymphoma"[MeSH] "NPC"[tiab] OR "nasopharyngeal carcinoma"[tiab] OR "nasopharyngeal cancer"[tiab] "nasopharyngeal tumor"[tiab] OR "nasopharyngeal tumour"[tiab] "astric cancer"[tiab] OR "gastric carcinoma"[tiab] OR "gastric tumor"[tiab] OR "gastric tumour"[tiab] "stomach cancer"[tiab] OR "stomach carcinoma"[tiab] OR "EBV-associated gastric cancer"[tiab] OR "EBVaGC"[tiab] "Burkitt lymphoma"[tiab] OR "Burkitt's lymphoma"[tiab] OR "Burkitt-like lymphoma"[tiab] "endemic Burkitt lymphoma"[tiab] OR "sporadic Burkitt lymphoma"[tiab]

3	AND ("Africa"[MeSH] OR "Africa South of the Sahara"[MeSH] OR "North Africa"[tiab] OR "Sub-Saharan Africa"[tiab] OR "East Africa"[tiab] OR "West Africa"[tiab] OR "Southern Africa"[tiab] OR "Central Africa"[tiab] OR "Algeria"[tiab] OR "Angola"[tiab] OR "Benin"[tiab] OR "Botswana"[tiab] OR "Burkina Faso"[tiab] OR "Burundi"[tiab] OR "Cabo Verde"[tiab] OR "Cameroon"[tiab] OR "Central African Republic"[tiab] OR "Chad"[tiab] OR "Comoros"[tiab] OR "Congo"[tiab] OR "Côte d'Ivoire"[tiab] OR "Djibouti"[tiab] OR "Egypt"[tiab] OR "Equatorial Guinea"[tiab] OR "Eritrea"[tiab] OR "Eswatini"[tiab] OR "Ethiopia"[tiab] OR "Gabon"[tiab] OR "Gambia"[tiab] OR "Ghana"[tiab] OR "Guinea"[tiab] OR "Guinea-Bissau"[tiab] OR "Kenya"[tiab] OR "Lesotho"[tiab] OR "Liberia"[tiab] OR "Libya"[tiab] OR "Madagascar"[tiab] OR "Malawi"[tiab] OR "Mali"[tiab] OR "Mauritania"[tiab] OR "Mauritius"[tiab] OR "Morocco"[tiab] OR "Mozambique"[tiab] OR "Namibia"[tiab] OR "Niger"[tiab] OR "Nigeria"[tiab] OR "Rwanda"[tiab] OR "Sao Tome and Principe"[tiab] OR "Senegal"[tiab] OR "Seychelles"[tiab] OR "Sierra Leone"[tiab] OR "Somalia"[tiab] OR "South Africa"[tiab] OR "South Sudan"[tiab] OR "Sudan"[tiab] OR "Tanzania"[tiab] OR "Togo"[tiab] OR "Tunisia"[tiab] OR "Uganda"[tiab] OR "Zambia"[tiab] OR "Zimbabwe"[tiab]) AND ("2000/01/01"[Date - Publication] : "2025/03/31"[Date - Publication])
FINAL	Filters None Results 789

Table 3. Scopus Search Strategy

Parameter	Details
Database	Scopus (https://www.scopus.com)
Search Date	March 31, 2025
Search Field	TITLE-ABS-KEY (Title, Abstract, Keywords)
Date Range	2000 – 2025 (PUBYEAR > 1999 AND PUBYEAR < 2026)
Line	Search Query
1	TITLE-ABS-KEY("Epstein-Barr virus" OR "Epstein Barr virus" OR EBV) TITLE-ABS-KEY("human herpesvirus 4" OR "human herpesvirus-4" OR "HHV-4" OR HHV4)", TITLE-ABS-KEY("herpes virus 4" OR "gammaherpesvirus 4" OR "Herpesvirus 4, Human")

2	TITLE-ABS-KEY("nasopharyngeal carcinoma" OR "nasopharyngeal cancer" OR "nasopharyngeal tumor" OR "nasopharyngeal tumour" OR NPC)" TITLE-ABS-KEY("gastric cancer" OR "gastric carcinoma" OR "gastric tumor" OR "gastric tumour" OR "stomach cancer" OR "stomach carcinoma")" TITLE-ABS-KEY("EBV-associated gastric cancer" OR EBVaGC)", TITLE-ABS-KEY("Burkitt lymphoma" OR "Burkitt's lymphoma" OR "Burkitt-like lymphoma" OR "endemic Burkitt lymphoma" OR "sporadic Burkitt lymphoma")
3	TITLE-ABS-KEY("Africa" OR "Sub-Saharan Africa" OR "North Africa" OR "East Africa" OR "West Africa" OR "Southern Africa" OR "Central Africa"), TITLE-ABS-KEY(Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR "Cabo Verde" OR Cameroon OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Côte d'Ivoire" OR Djibouti), TITLE-ABS-KEY(Egypt OR "Equatorial Guinea" OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea-Bissau" OR Kenya OR Lesotho OR Liberia OR Libya)., TITLE-ABS-KEY(Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR "Sao Tome and Principe" OR Senegal OR Seychelles OR "Sierra Leone") TITLE-ABS-KEY(Somalia OR "South Africa" OR "South Sudan" OR Sudan OR Tanzania OR Togo OR Tunisia OR Uganda OR Zambia OR Zimbabwe) Date limit: PUBYEAR > 1999 AND PUBYEAR < 2026
Final	Results 312

Table 4. Web of Science Search Strategy

Parameter	Details
Database	Web of Science Core Collection (https://www.webofscience.com)
Search Date	March 31, 2025
Search Field	TS = Topic (Title, Abstract, Author Keywords, Keywords Plus)
Indexes	SCI-EXPANDED, SSCI, AHCI, ESCI
Date Range	2000 – 2025 (PY=2000-2025)
Line	Search Query
1	EBV terms: TS=("Epstein-Barr virus" OR "Epstein Barr virus" OR EBV) TS=("human herpesvirus 4" OR "human herpesvirus-4" OR "HHV-4" OR HHV4 OR "herpes virus 4" OR "gammaherpesvirus 4" OR "Herpesvirus 4, Human")

2	Cancer terms: TS=("nasopharyngeal carcinoma" OR "nasopharyngeal cancer" OR "nasopharyngeal tumor" OR "nasopharyngeal tumour" OR NPC) TS=("gastric cancer" OR "gastric carcinoma" OR "gastric tumor" OR "gastric tumour" OR "stomach cancer" OR "stomach carcinoma" OR "EBV-associated gastric cancer" OR EBVaGC) TS=("Burkitt lymphoma" OR "Burkitt's lymphoma" OR "Burkitt-like lymphoma" OR "endemic Burkitt lymphoma" OR "sporadic Burkitt lymphoma")
3	Africa terms: TS=("Africa" OR "Sub-Saharan Africa" OR "North Africa" OR "East Africa" OR "West Africa" OR "Southern Africa" OR "Central Africa") TS=(Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR "Cabo Verde" OR Cameroon OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Côte d'Ivoire" OR Djibouti OR Egypt OR "Equatorial Guinea" OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea-Bissau" OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR "Sao Tome and Principe" OR Senegal OR Seychelles OR "Sierra Leone" OR Somalia OR "South Africa" OR "South Sudan" OR Sudan OR Tanzania OR Togo OR Tunisia OR Uganda OR Zambia OR Zimbabwe)
4	Date limit: PY=(2000-2025)
FINAL	Document Type Restriction None Results 118

Table 5. African Journals Online (AJOL) Search Strategy

Parameter	Details
Database	AJOL (https://www.ajol.info)
Limitation	AJOL does not support complex Boolean or date filters
Search Approach	
Step 1: "Epstein-Barr virus" OR EBV	
Step 2: Manual filtering for African cancer studies (NPC, gastric cancer, Burkitt lymphoma)	
Step 3: Targeted journal browsing: <i>African Health Sciences, East African Medical Journal, Pan African Medical Journal, South African Journal of Oncology</i>	
Results 28	

Table 6. Search Execution Statement

Item	Details
Searches executed by	Saleamlak Sebsibe and Afewerk Habtamu

Search execution date	March 31, 2025
Reference management software	EndNote
Deduplication method	Automated plus manual review
Date range justification	PCR standardization post-2000; contemporary relevance
Language restrictions	Other than English
Publication type restrictions	None (all types screened; reviews, editorials, case reports excluded at eligibility stage)

Table 7. Additional Search Methods

Method	Description
Hand searching	Reference lists of all 19 included studies and relevant systematic reviews were manually screened
Grey literature	Not searched (per PRISMA guidelines for prevalence systematic reviews)
Author contact	Corresponding authors of studies with incomplete data were contacted via email; no additional data were obtained

Table 8. Date Range Justification

Rationale	Explanation
PCR standardization	Widespread adoption of standardized EBV DNA PCR in clinical research began around 2000
EBER-ISH availability	Commercial EBER-ISH probes became widely available after 2000
Contemporary relevance	Older studies (pre-2000) used less sensitive detection methods (serology only) that cannot distinguish tumor-associated EBV from latent infection
African research output	Systematic cancer epidemiology research in Africa expanded significantly after 2000