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Comparative study on factors associated with voluntary HIV counselling and testing uptake and accepting attitudes towards people living with HIV/AIDS among adults in Sub-Saharan Africa countries: A cross-sectional survey

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Background & Aim: As the global HIV/AIDS epicenter, the Sub-Saharan Africa (SSA) region has been conducting the national HIV voluntary counselling and testing (VCT) campaign to control HIV infection. To explore a puzzle about why high-level VCT is related inconsistently to low-high HIV infection, we performed an integrative structure analysis to identify and characterize the path model of VCT uptake on three main influential factors, HIV-related comprehensive knowledge, attitude towards people living with HIV/AIDS (PLWHA) and risky sexual behaviour, among adults.

Methods & Findings: Adjusted by the demographic and socio-economic covariates, complex sample logistic regression was employed to build the path model of VCT uptake at the individual level in a nationally representative dataset from the demographic and health survey of seven SSA countries. We identified a tight structure of path connections among VCT uptake and the three influential factors for the countries with lower HIV incidence (e.g., Democratic Republic of Congo and Ethiopia) and a loose structure for those with the highest HIV incidence (e.g., Namibia and Lesotho). Using a mediation analysis, we detected the strongest direct positive effect of highly risky sexual behaviour on VCT uptake, the adjusted odds ratio (aOR) ranged from 1.883 to 5.540 and all p-values <0.001 in the sampled SSA countries. But the other direct and indirect paths of HIV-related knowledge and attitude towards PLWHA to VCT uptake did not have consistent significance. With controlling the effect of covariates, a partial contingency coefficient for measuring the degree of association between two categorical variables was developed as a partial correlation coefficient for two continuous variables. The partial contingency coefficients of the direct and indirect paths of the three factors to VCT uptake were adopted as partial least squares (PLS) regressors on the logit transformation of 2013-2016 HIV incidence rates at the country level. According to World's criterion, we determined two critical paths to VCT uptake, the direct path of risky sexual behaviour and the indirect path of HIV-related comprehensive knowledge through risky sexual behaviour, in affecting population HIV incidence. Their standardized PLS coefficients range from 0.52 to 0.57 as well as from -0.61 to -0.60, respectively, suggesting that population HIV incidence was affected positive by the former path but negatively by the latter. Our study's limitations are that HIV testing status is subject to information bias, and that further work is needed to validate these findings using a prospective study.

Conclusions: The work identifies the opposite effect on population HIV incidence from the two critical paths to VCT uptake, the direct path of risky sexual behaviour and the indirect path of HIV-related knowledge to VCT uptake, and provides evidence for future studies of an HIV/AIDS health education system based on a balanced bidirectional model of knowledge, attitudes and behaviour to prevent and control HIV/AIDS.

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