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WORKFORCE PRODUCTIVITY LOSS AND HEALTHCARE BURDEN FROM KUSH USE IN LIBERIA

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ABSTRACT

Background: Kush, a psychoactive substance comprised of synthetic cannabinoids, has become an increasing public health and socio-economic problem in Liberia. Its emergence has been associated with increasing physical and mental health decline, increased healthcare utilization, and the decline in productivity for the national workforce. The addictive quality of Kush, combined with its low cost and widespread access, has hastened its emergence among youth and working-age adults, creating a dual burden on health systems and the economy. As an important first step to developing policy solutions, it is important to understand Kush's measurable consequences for healthcare utilization, out-of-pocket (OOP) spending, and productivity. **Methods:** We conducted a cross-sectional survey of 998 respondents that we recruited in collaboration with non-government organizations (NGOs), community-based organizations (CBOs), international NGOs (INGOs), United Nations agencies, and civil society organizations. A structured questionnaire was designed to collect information on socio-demographic characteristics, frequency of Kush use, self-reported health status, healthcare service utilization, OOP medical costs associated with healthcare access, and productivity indicators in the workplace such as absenteeism and presenteeism. For all variables, descriptive statistics—means, standard deviations (SD), percentages—were calculated. **Results:** Of the participants, 72.6% were male, with a mean age of 29.4 years (SD 6.8). Past 30 day Kush use was reported by 64.8% of participants, with a mean of 18.2 days/month (SD 7.5). Forty-two point three percent of users reported at least one outpatient visit within the last month, and 18.7%, at least one hospitalization within the last year. The mean OOP monthly healthcare cost was 3,450 LRD (SD 1,290). The productivity analysis showed absenteeism of 14.6% and presenteeism of 28.9%, resulting in an overall productivity loss of 41.8%. **Conclusion:** Kush use is already a significant, measurable burden on Liberia's healthcare system and economic output, highlighting the critical need for a coordinated approach in health, policy, and workplace initiatives.

KEYWORDS: Kush, synthetic cannabinoids, Liberia, healthcare burden, workforce productivity, absenteeism, presenteeism.

INTRODUCTION

Kush is becoming more prevalent in Liberia, as indicated by both anecdotal references and recent empirical research, suggesting that kush is readily available and increasingly used, especially by adolescents and young adult males in urban and peri-urban areas.[1] Kush is generally shredded herbal material with synthetic cannabinoids or other psychoactive agents, and it is often commercially available with no controls over composition. In fact, the composition is often highly variable in potency and can be a chemical suicide across several herbs mixed with synthetics that have unpredictable toxicity and risk, and reported adverse outcomes associated with Kush ingestion have included, but are not limited to, acute intoxication, respiratory distress, loss of consciousness or cognition, psychosis, and other psychiatric phenomenon.[3]

Kush's socioeconomic costs extend beyond its health-related costs. Substance misuse can impact the economy by its costs to productivity because of absenteeism (not coming to work), presenteeism (coming to work but being unproductive), and turnover (as individuals leave their employment).[4] In an economy particularly with fragile or developing economies, such as Liberia, cumulative productivity losses from Kush could translate

into lower or no GDP growth, neglected approaches and efforts to address unemployment, and stalled attempts to reduce poverty.[5]

Simultaneously, the country's already strained healthcare system is under increased pressure. Liberia's health system faces various challenges related to limited service capability, geographical disparities, and chronic underfunding.[6] The increasing demands for healthcare arising from substance misuse injuries, psychiatric crises, and other chronic, noncommunicable complications put further stress on available resources, forcing them away from other urgent public health needs.

Despite increasing acknowledgment of these threats, there remain few quantitative data linking Kush consumption to the burden on health services and productivity lost to the workforce in Liberia.[7] Addressing this knowledge gap is fundamentally important to inform national policies; workplace programs; and community-level interventions. This study provides a descriptive analysis of these effects through a large, diverse national sample gathered in partnership with a number of NGOs, CBOs, INGOs, UN agencies and civil society organizations).

METHODS

Study Design and Participants

From January 2025 to April 2025, we undertook a cross-sectional study for the purposes of surveying adults 18 years of age or older residing in Liberia. The participants were recruited purposefully and through a snowball sample. The authors leveraged networks established by non-governmental Organizations (NGOs) community-based, international non-governmental organizations (INGOs), United Nations agencies and civil society organizations actively engaging with individuals in health and social outreach.[4,9] The participants were recruited from community centers, vocational programs, rehabilitation support programs and outreach activities to ensure urban and rural residents were involved.

Exploration of Data Collection

Data collection was performed using a structured questionnaire that assessed socio-demographics, Kush use (age of initiation, frequency, duration and context of use), and self-reported health outcomes. Health service utilization was evaluated as the number of outpatient appointments in the past 30 days and any hospital admissions in the past year. The health service costs (total direct medical and non-medical costs), health services cost (direct medical: e.g., consultations, medications and diagnostics) and health services cost (direct non-medical costs: e.g., transport, caregiving) were assessed for generalizability. Work productivity (absenteeism, presenteeism and overall loss of productivity) was evaluated using validated items adapted from the WHO Health and Work Performance Questionnaire (HPQ) and the Work Productivity and Activity Impairment (WPAI) scale.[5,6]

Variables and Analyses

The primary exposure variable was past-30-day Kush use, obtained in both a binary measure (yes/no) and as a continuous measure of frequency (days/month). Primary outcome variables included health care utilization rates, out-of-pocket (OOP) health care costs (Liberian Dollars), absenteeism (%), presenteeism (%), and combined productivity loss (%). All analyses were completed using IBM SPSS Statistics version 25. Descriptive statistics summarized the data: means and standard deviations (SD) for continuous variables and counts with percentages for categorical variables.

Ethical Considerations

The Desh Bhagat University Institutional Review Board granted ethical approval (Approval Number: IRB/DBU/2024/017). All participants provided written informed consent and ensured anonymity by using unique identifiers instead of names. The participants' involvement was completely voluntary, with no incentives given to avoid coercion. Data was secured by using password-protected file servers only accessible by the research team. Community engagement was a priority and the local community leaders were engaged in program development and survey administration to honor the local traditions and values.

RESULTS

Table 1: Sociodemographics & Kush Use Patterns (n = 998).

Variable	Value
Male, n (%)	725 (72.6%)
Age, mean ± SD (years)	29.4 ± 6.8 (range 18–55)
Lifetime Kush use, n (%)	681 (68.2%)
Past-30-day use, n (%)	647 (64.8%)
Days of use/30 days, mean ± SD	18.2 ± 7.5

The study sample consisted of 998 respondents; most were male (72.6%, n=725). The average age was 29.4 years (SD 6.8), with ages ranging from 18 to 55 years indicating that respondents were predominantly young adults in the prime working-age population. Lifetime Kush use was reported by 68.2% (n=681) of respondents which is indicative of the depth of penetration of the substance into the sampled communities. More specifically, past-30-day use was reported by 64.8% (647) indicating that most individuals with a history of

use are still current users. Among those who reported use in the past month, usage frequency was very high, with a mean of 18.2 days (SD 7.5) out of 30 days indicating patterns of near-regular (or sustained) consumption. Such high frequency would suggest both potential dependency and a sustained exposure to the associated health and productivity risks of Kush. The sociodemographics of this population and its usage patterns reveal the considerable public health and socio-economic significance of Kush in Liberia, especially because of the age group's significance for the country's labour force.

Table 2: Healthcare Utilization & Costs Among Kush Users (n = 647).

Indicator	Value
≥1 clinic visit (30 days), n (%)	422 (42.3%)
≥1 hospitalization (12 months), n (%)	121 (18.7%)
Monthly OOP cost, mean ± SD (LRD)	3,450 ± 1,290
Non-medical cost per visit, mean ± SD (LRD)	520 ± 230

Among the 647 respondents reporting past-30-day Kush use, healthcare utilization was significant. In the past 30 days, 42.3% (n = 422) reported that they made at least one clinic visit, representing a sizeable outpatient service demand. Hospital-based care visits remained significant, with 18.7% (n = 121) reporting that they experienced at least one hospitalization in the past 12 months, which might have reflected a severe or acute health event associated with Kush use. The financial burden on users was considerable, with a mean monthly, out-of-pocket (OOP) healthcare cost of 3,450 Liberian Dollars (LRD) (SD 1,290). Beyond direct medical care, non-medical costs (e.g., public transport, meals, caregivers) averaged 520 LRD (SD 230) per healthcare visit. Together, these results indicate the double burden of healthcare demand and financial costs that can perpetuate economic vulnerability, especially considering where this burden is felt among working-age respondents. Together these results demonstrate the potential for Kush use to strain the always limited health system and household resources as represented by ongoing outpatient care, repeated hospitalizations, and regular OOP expenses.

Table 3: Workforce Productivity Metrics (Employed Kush Users, n = 523).

Metric	Value
Scheduled hours/week, mean ± SD	40.0 ± 5.2
Absenteeism, hours/week, mean ± SD	5.8 ± 3.1
Absenteeism %, mean ± SD	14.6 ± 7.8%
Presenteeism score (0–10), mean ± SD	2.9 ± 1.4
Presenteeism %, mean ± SD	28.9 ± 13.9%
Overall productivity loss %, mean ± SD	41.8 ± 11.2%

Among the 523 employed respondents who indicated past-30-day Kush use during the online survey, the losses in productivity were sizeable. Participants were on average scheduled to work 40.0 hours per week (SD 5.2), and absenteeism (missing work) accounted for 5.8 hours of work each week (SD 3.1), meaning that respondents were absent for 14.6% of their scheduled hours (SD 7.8%). The average presenteeism (decreased effectiveness while present) score on the presenteeism scale was 2.9 out of 10 (SD 1.4), meaning there was an average productivity loss due to presenteeism of 28.9% (SD 13.9%). The combined absenteeism and presenteeism indicated an average productivity loss of 41.8% (SD 11.2%). In other words, employed Kush users lost on average almost two-fifths of the possible work output; this is important, as it shows the substantial economic costs associated with Kush use that are likely to decrease an individual's earning power, reduce employer performance, and reduce national economic productivity. These findings suggest that the economic costs associated with Kush use extend well beyond healthcare costs. The amount of lost labour input is likely to disproportionately contribute to shrinking Liberia's fragile economy.

DISCUSSION

This study offers quantitative evidence of the substantial healthcare and economic burden of Kush use in Liberia. The study supports apprehensions raised in prior regional evaluations of synthetic cannabinoid use (1, 4). The observed prevalence of past-month use (64.8%) aligns with outreach-based surveillance research that reported similar levels of exposure among urban and peri-urban youth populations; users were also apparently responding to contextual issues of availability, cost, and peer pressures driving high use.[2,7]

Healthcare service utilization was high among users. More than two in five users had at least one outpatient visit in the prior month, and nearly one in five had been hospitalized in the previous 12 months. These hospitalizations likely coincide with prior hospital-based case series that highlighted patients who had Kush intoxication associated with acute respiratory compromise, cardiovascular instability, and significant neuropsychiatric disturbances that required inpatient stabilization.[3,6] The identified patterns reflect a direct burden on an already challenged healthcare system that consistently faces issues around mental health services and emergency care availability.

The estimated mean monthly out-of-pocket (OOP) healthcare cost of 3,450 Liberian Dollars fits well with cost-of-illness studies in the same low-resource setting, wherein substance-related medical care makes up an outsized portion of household health expenditures.[7,8] While non-medical expenses like transportation and caregiving were smaller in magnitude, they also added to the economic burden on households' finances.

From an economic productivity viewpoint, the total absenteeism and presenteeism losses recorded (41.8%) is quite alarming. Those losses are consistent with international evidence suggesting that substance misuse may shrink real labour capacity up to one-third or greater.[5,9] The total reported in this instance is larger than estimates reported in non-conflict African economies and is likely reflective of the unique interaction that's taken place due to the prevalence of Kush use, Liberia's labour market issues, and lack of substantial occupational health systems.[4, 10]

Across the board, these findings signal that an immediate, multi-dimensional national response that links prevention programming at the community level, access to treatment and rehabilitation services, workplace substance use policies and economic support initiatives, is required to reduce the health and productivity issues associated with Kush use.

Take-Home Message

Kush use in Liberia's working-age population is negatively impacting the productive capacities of our workforce from higher levels of absenteeism, presenteeism, and workplace accidents, and driving up healthcare costs associated with treating addiction, mental health conditions, and other physical illnesses associated with Kush use. The combined economic burden of lost productivity, spending on healthcare costs, and strains on social service budgets is a pressing national development concern. There is an urgent multi-sectoral need for a response package that includes prevention, early intervention, rehabilitation, and support for reintegration into the workforce to preserve both human capital and economic health.

Authors' Contributions

Stephen Monday: Conceptualizing, acquiring data, statistical analysis, drafting the manuscript, and fundamental revisions. Prof. (Dr) H. K. Sidhu: supervising and methodological advice, and validating the data and findings, and final proof of the manuscript upon submission to the relevant journals. Atul Khajuria: provided assistance with data analysis, visualization, and literature review. Shu-Achet Daniel Gimbason: assisted with field coordination, recruitment of research participants, and verification of data. Marche Saygee Toh: contextualizing the data and findings, proofreading, and formatting of the manuscript for submission.

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Conflict Of Interest

The authors attest that no conflicts of interest exist with this publication. They have no financial relationship, personal association, institutional obligation, or professional interest which might have inappropriately affected the performance, analysis, or reporting of the study. The study and findings reported rest on scientific evidence and observations from the community.

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