Group8 Team Report – Systems Thinking Hackathon 2025

Team Details:

- **Team Name:** Group8
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- **Problem Domain:** Health and Wellness
- **Specific Problem:** Why are mental health concerns (especially anxiety and depression) rising among school and college students in cities, despite increased awareness and services?
- **Final Output Format:** Web platform (with a screen-recorded demo video, URL to be provided in the report).

1. Introduction to the Problem

Mental health issues among urban students have escalated dramatically in recent years. For example, a large NIMHANS-led survey of 8,542 college students across nine Indian states found **33.6%** reporting moderate-to-severe depression and **23.2%** with moderate-to-severe anxietypubmed.ncbi.nlm.nih.gov. Experts attribute this surge largely to **academic and competitive pressures**: students face intense exam workloads and fierce competition for limited college seats or jobstimesofindia.indiatimes.comtimesofindia.indiatimes.com. Parental expectations compound the stress, as many families push children to outperform peers, which can precipitate mental disorders when youths cannot copetimesofindia.indiatimes.com.

At the same time, **social factors** are aggravating the problem. High social media and screen use (especially in cities) are linked to worsening mood: U.S. data show urban teens with ≥4 hours/day screen time are significantly more likely to report anxiety or depression symptomscdc.gov. Experts note that social media often **peddles an idealized, "picture-perfect" life**, leading to unhealthy peer comparisons that erode self-esteem and trigger anxietytimesofindia.indiatimes.comballardbrief.byu.edu. Economic pressures (e.g. rising education costs and uncertain job markets) also add to students' worriesballardbrief.byu.edu.

2. Process Followed

- **Problem Scoping & Research:** Team formed and refined the problem statement. We conducted an extensive literature review on youth mental health (academic studies, news reports, policy documents) to understand key drivers.
- **Stakeholder Mapping:** Identified stakeholders (students, parents, schools/colleges, counselors, government) and gathered their perspectives.
- **Modeling:** Brainstormed with the team to identify factors (e.g. academic pressure, social media, coping mechanisms) and sketched an initial causal loop diagram (CLD). We iterated on the CLD to capture feedback loops affecting student anxiety and depression.
- **Variable Definition:** Finalized the CLD and prepared a table of all variables, providing clear, concise definitions for each.
- **Leverage Point Analysis:** Using the CLD, we identified points of high leverage in the system and classified them according to Donella Meadows' 12 leverage points framework. We assessed why each point is important and what small change could produce big impact.

- **Archetype Identification:** We examined the CLD loops for recurring system behavior patterns (archetypes) such as “Fixes That Fail” or “Escalation,” and explained their roles in driving the problem.
- **Event-Pattern-Structure Analysis:** We described the **events** (e.g. rising anxiety incidence, student suicides), **patterns** (e.g. steadily increasing rates, spikes around exam time), and underlying **structure** (incentives, norms, policies) sustaining these trends. We evaluated whether current interventions address surface issues or root causes, and proposed deeper structural changes.
- **Solution Development:** As mandated, we designed a **web platform** prototype (to deliver mental health resources and peer support) and recorded a demo video, linking it in our report.
- **Report Compilation:** Finally, we organized findings into this report per the template, ensuring a clear flow and citation of all sources.

3. Causal Loop Diagram (CLD)

Figure 1: Causal loop diagram illustrating key feedback loops affecting anxiety and depression levels among urban students. Our CLD highlights how factors like **Academic Pressure**, **Family Expectations**, **Social Media Use**, and **Sleep Duration** interact to influence student **Anxiety and Depression Level**. For instance, higher academic pressure (exams/competition) raises anxiety, which may drive students to use social media more as an escape.

The diagram above incorporates both *reinforcing loops* (e.g. Social Media Use ↔ Anxiety) and *balancing loops* (e.g. Counseling → reduced Anxiety) that together shape the mental health of students. The table below lists all variables shown in the CLD and their definitions for clarity.

Variable	Definition
Academic Pressure	Demands and stress associated with school/college performance (e.g. exams, grades, competitive admissions).
Family Expectation	The level of pressure or expectations from parents/family for the student to achieve high academic/career success.
Peer Comparison/Pressure	Stress arising from comparing oneself to peers’ achievements or feeling pressured to match classmates’ success.
Self-esteem	The student’s overall sense of personal worth and confidence in their abilities.
Social Media Use	Time spent on social networks and online content, through which students connect, compare, or seek distraction.
Screen Time	Total hours per day spent on digital devices (smartphones, tablets, computers), often related to social media, gaming, or online study.
Sleep Duration	Average hours of sleep per night. Reduced sleep can impair mood and resilience.
Anxiety and Depression Level	Overall intensity of anxiety and depressive symptoms experienced by the student (higher levels indicate worse mental health).

Variable	Definition
Utilization of Mental Health Services	Frequency of seeking professional help (counseling, therapy) or using resources designed to address student mental health issues.

4. Leverage Points Analysis

Identifying high-leverage interventions helps target the system's behavior. The table below lists our key leverage points, the associated category in Meadows' hierarchy, and the potential impact of intervening there:

Leverage Point	Meadows Category	Why Important	Expected Impact
Integrate Mental Health Education in Schools	Information Flows (#6)	Embeds awareness and coping strategies into the curriculum. School programs (e.g. *Youth Aware of Mental Health*) have proven highly effective in reducing student distressjournals.lww.com.	Early education on stress management and recognition of symptoms can prevent issues from escalating. Improved literacy yields better self-care and peer support.
Parental Awareness & Counseling Workshops	Paradigms (#2)	Targets the underlying mindset of families. Counseling parents to set realistic expectations can change the culture of success at all costs. Experts emphasize that *"counselling of parents is more important than counselling of students"*timesofindia.indiatimes.com.	Shifting family attitudes can dramatically reduce undue pressure on students. Supports a more nurturing home environment, decreasing student anxiety.
Academic Policy Reforms (Reduce Exam Stress)	Rules of the System (#5)	Alters formal school rules and goals. For example, decentralizing high-stakes exams or promoting skill-based evaluation addresses the root academic drivers of stress.	Changing rules can reshape the education "game": fewer cram-centric tests and more balanced assessment would lower chronic stress and suicide risk.
Expand Digital Mental Health Access (Tele-counseling)	Information Flows (#6)	Lowers barriers to help. India's Tele-MANAS helpline has handled **1.81 million calls** since 2022mohfw.gov.in, showing huge demand. Scaling this and integrating AI/chatbots widens timely support.	Easier access (via apps or hotlines) means students can get help early. In the short term, this reduces acute

Leverage Point	Meadows Category	Why Important	Expected Impact
			crises (balancing loop). Over time, it normalizes help-seeking.
Media/Social Media Literacy Campaigns	Information Flows (#6) / Paradigms (#2)	Teaches healthy social media use and critical thinking about online content. Countering the "perfect life" narrative can reduce harmful peer comparisontimesofindia.indiatimes.com.	Improves students' resilience to social media pressure. Over time can change peer norms, raising collective self-esteem and lowering anxiety trends.

5. System Archetypes Identified

Our CLD reveals classic system archetypes affecting student mental health:

- **Fixes That Fail:** Students often resort to quick fixes (e.g. scrolling social media, pulling all-nighters) hoping to relieve stress. These "fixes" backfire: excessive media use and sleep deprivation actually *increase* anxiety and depressiontimesofindia.indiatimes.comcdc.gov. The intended short-term relief fails and may worsen the original problem, trapping students in a vicious loop.
- **Shifting the Burden:** Current interventions tend to address symptoms (counseling sessions, medications) rather than systemic causes. For example, adding more therapy slots or psychiatric meds does not reduce the high-stakes exam culture or change family pressuresjournals.lww.com. This reflects a "shifting the burden" archetype: relying on quick symptom relief while neglecting deeper change.
- **Escalation:** Intense competition acts as an escalating feedback loop. As some students excel (pushed by parents/schools), others feel pressure to catch up, leading parents and educators to push even harder. This mutual reinforcement raises anxiety levels across the boardtimesofindia.indiatimes.com. In effect, each actor's drive to "win" academically escalates stress for all, resembling the "success to the successful" but with everyone locked in a rat race.

Understanding these archetypes clarifies why small interventions can have counterintuitive effects. It shows the need for coordinated, systemic solutions rather than isolated fixes.

6. Event → Pattern → Structure Analysis

Event (Symptom): We observe acute incidents: rising cases of student anxiety/depression and even self-harm/suicide. In one study 18.8% of college students had seriously considered suicide (lifetime) and 12.4% in the past yearpubmed.ncbi.nlm.nih.gov. Schools report spikes in counseling visits or crises around exam results. These are **events** signaling distress.

Pattern (Trend): These events reflect a concerning trend. Multiple studies and clinics note a steady year-over-year increase in reported mental health issues among youthtimesofindia.indiatimes.compubmed.ncbi.nlm.nih.gov. Telehealth usage has soared (e.g. Tele-MANAS has fielded ~1.8M calls since 2022mohfw.gov.in). The pattern is clear:

more students suffer and seek help each year, especially in urban areas. High anxiety/depression symptoms remain persistent over time rather than isolated incidents.

Structure (Root Causes): At the structural level, the education and social system drive these trends. The prevailing norms – **high-stakes exams, curriculum overload, and societal success metrics** – create constant pressure. Schools and families prioritize academic achievement (a systemic goal), and competition is ingrained (structure). Meanwhile, **mental health infrastructure is under-integrated**: many schools lack counselors, and families often lack awarenessjournals.lww.com. Negative feedback (like counseling referrals) exists, but reinforcing loops (e.g. academic competition → stress) dominate.

Proposed Redesign (Structure): We recommend fundamental changes: embed mental health education and coping-skill training in schools (aligning schooling goals with well-being)journals.lww.com; adjust academic policies (e.g. de-emphasize single exam outcomes, allow failure with support); and involve parents/schools in changing success paradigmstimesofindia.indiatimes.comjournals.lww.com. Structural fixes like integrating counseling into every school, training teachers to recognize distress, and reforming admission criteria would address the root, ensuring lasting improvement.

7. Additional Insights

- **Urban Lifestyle:** City students often face unique pressures: congested living, competitive job markets, and 24/7 connectivity. U.S. data show metropolitan teens get more screen time and have higher anxiety rates than rural peerscdc.gov, suggesting urban youth are especially vulnerable.

- **Sleep and Circadian Factors:** Limited sleep is a significant insight. High screen/social media use cuts into sleep duration, which degrades mood and cognition. We found evidence (CDC) linking >4h screen time with depression/anxietycdc.gov, underscoring that structural demands reducing sleep exacerbate mental health problems.
- **Youth Literacy Gap:** Despite campaigns, mental health literacy is low. Only ~29% of Indian adolescents could identify depressioneduindex.org. This suggests that even with awareness efforts, many students still misinterpret symptoms or attribute them to weakness, delaying help-seeking.

8. References

- Osorio & Hyde (2021). *The Rise of Anxiety and Depression Among Young Adults.* Ballard Briefballardbrief.byu.edu.
- Cherian et al. (2024). *Mental Health, Suicidality, and Social Indicators Among College Students Across India.* Indian Psychiatry Journalpubmed.ncbi.nlm.nih.gov.
- Zablotsky et al. (2024). *Daily Screen Time Among Teenagers.* NCHS Data Brief, CDCcdc.gov.
- Times of India (Oct 2024). *"Students bogged down by exam stress, parental pressure: Experts."*timesofindia.indiatimes.comtimesofindia.indiatimes.com.
- Srivastava et al. (2016). *Mental Health Awareness: The Indian Scenario.* Ind Psychiatry Jeduindex.org.

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