

1. Introduction

The Experience Sample Method (ESM) is a research technique used to collect **real-time** data on individuals’ **thoughts, feelings, and behaviour** in their natural environment. This momentary assessment approach has proven valuable in **mental health research** for detecting emotional variability, contextual influences, and early warning signs of relapse or symptom exacerbation [1].

2. Problem

Despite its potential, ESM remains **underutilized in day-to-day clinical practice**. The lack of intuitive tools that translate ESM data into meaningful insights that clinicians can **easily interpret** and act upon is one of the biggest problems, considering that most tools available today **do not incorporate the needs** of clinicians from a **human-computer interaction** or **software design perspective** [2] or should be **better** and **systematically tested** with end-users [3].

3. Research Question

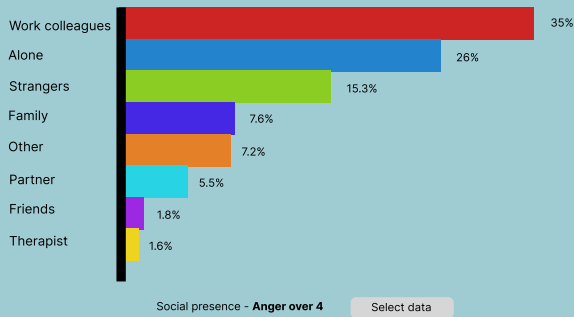
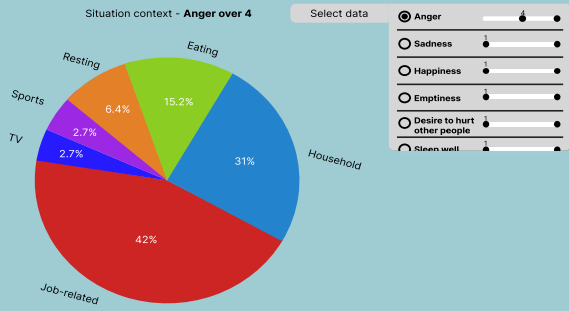
How can we present meaningful insights from ESM data to aid clinicians in mental health symptoms identification and intervention planning?

4. Method

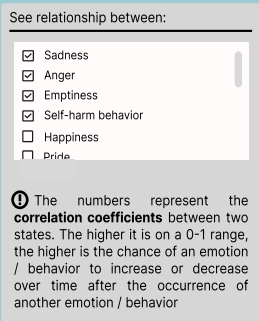
- Literature review about relevant insights in mental health symptom identification and visualization techniques.
- Survey psychology students and students in other fields about the visualizations’ usefulness, clarity and utility.
- Conduct thematic analysis on the open-ended responses.

Feedback loops and temporal tendencies: how one emotional state may influence another at a future time point.

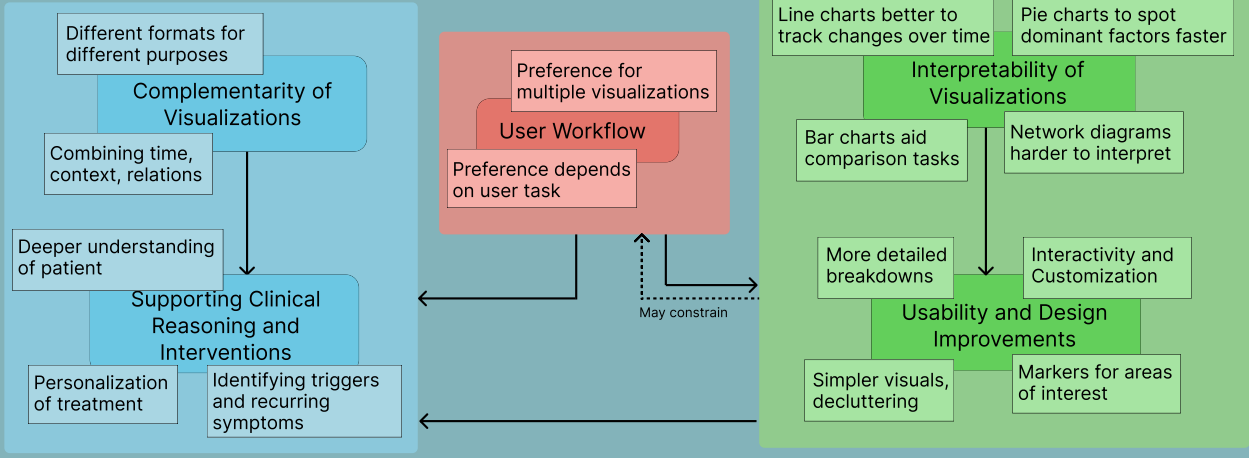
Contextual factors: understanding how symptoms manifest across contexts (social presence or activities) allows clinicians to identify environmental triggers.



Mood variability and emotional inertia: extent to which the average emotional states fluctuate and the degree to which emotional states persist over time, respectively.



5. Results



6. Discussion

The results suggest that no single visualization format fully captures the complexity of ESM data. Instead, combining temporal (line charts), contextual (bar/pie charts), and relational (network diagrams) perspectives supports contributes to a more complete clinical picture. Participants valued this complementary approach, with interpretability improving when visual elements were clearly labeled and tailored to different tasks, even in the case of network diagrams, which were considered the least intuitive. Overall, flexible, multi-visualization tools have the potential to support mental health assessment.

7. Limitations

- Feedback came from students, not practicing clinicians, the intended end-users.
- Small user sample size (N=8), which limits generalization and diversity of perspectives.
- Lack of prototype interactivity may not reflect real-world usage.

8. Future Work

- Develop interactive visualization tools with filters, zoom, and event markers to better support clinical workflows.
- Include mental health professionals in future evaluations to assess real-world usefulness.
- Validate the conceptual model of theme relationships (e.g., how workflow and usability influence reasoning) and build on top of this.
- Explore additional insights to expand ESM interpretation.

9. Conclusion

Combining temporal, contextual, and relational visualizations was perceived as more effective for identifying symptoms and planning interventions using ESM data. Each format offered distinct insights, but their value was greatest when integrated into a cohesive system, supporting a more complete understanding of a patient’s emotional dynamics.

References

[1] - van Os, J., Verhagen, S., Marsman, A., Peeters, F., Bak, M., Marcelis, M., ... & Delespaul, P. (2017). The experience sampling method as an mHealth tool to support self-monitoring, self-insight, and personalized health care in clinical practice. *Depression and anxiety*, 34(6), 481-493.

[2] - Weermeijer, J., Kiekens, G., Wampers, M., Kuppens, P., & Myin-Germeys, I. (2024). Practitioner perspectives on the use of the experience sampling software in counseling and clinical psychology. *Behaviour & Information Technology*, 43(3), 540-550

[3] - Bringmann, L. F., van der Veen, D. C., Wichers, M., Riese, H., & Stulp, G. (2021). ESMvis: a tool for visualizing individual Experience Sampling Method (ESM) data. *Quality of Life Research*, 30, 3179-3188.

