

AI-driven social listening research on menopausal symptom burden and impact on quality of life in women with natural or induced menopause

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INTRODUCTION

- Menopause is accompanied by a myriad of symptoms including hot flashes, night sweats, and mood swings, which can significantly impact the quality of life (QoL)¹, affecting emotional well-being, cognitive function, and physical health. Women's experiences of menopause can be highly heterogeneous, with variability in the types, onset, duration, and severity of symptoms. Understanding the complexity and variability in the menopausal journey is crucial for developing targeted interventions that can enhance the QoL for people undergoing this transition. This study aims to explore the feasibility to characterize targeted cohorts of women with menopausal symptoms participating in online communities and to assess how specific aspects, e.g., symptom burden, impact on QoL and treatment options, can be captured via retrospective Artificial Intelligence (AI)-driven social listening².

METHOD

- Posts from thirteen online health communities (US&UK) were retrieved between April 2020-April 2023.
- Reported experiences were algorithmically coded using dedicated NLP (Natural Language Processing) analyzers to identify cohorts of natural menopause (NM) or induced menopause (IM), and to detect their symptoms, QoL facets and treatments (Fig. 1). Women who self-reported menopause cause as, e.g., surgery or adjuvant endocrine therapy were grouped under IM cohort, or under the NM cohort otherwise.
- Data was collected and processed in an anonymized and secure way to ensure privacy and ethical aspects.

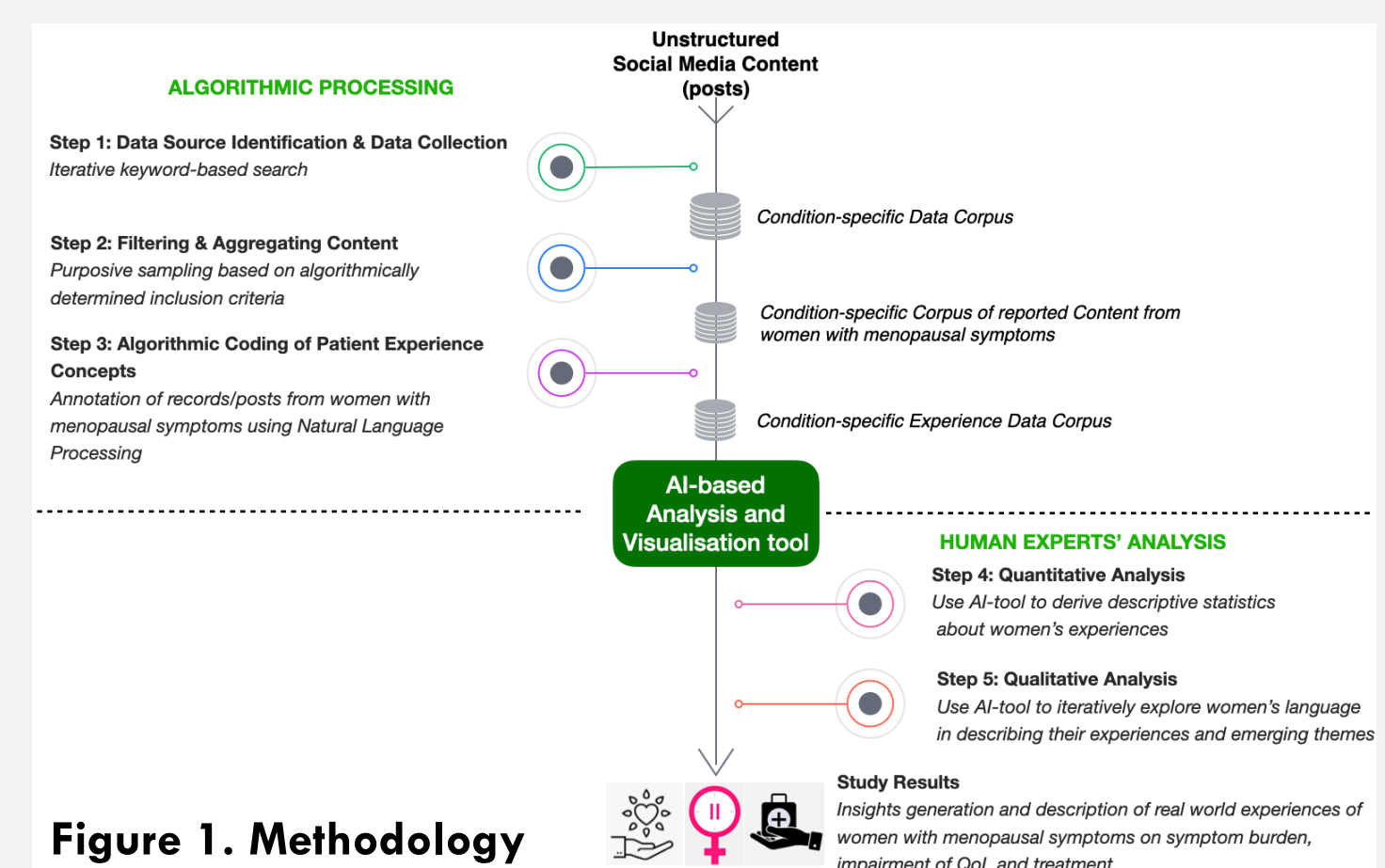


Figure 1. Methodology

RESULTS

Population data

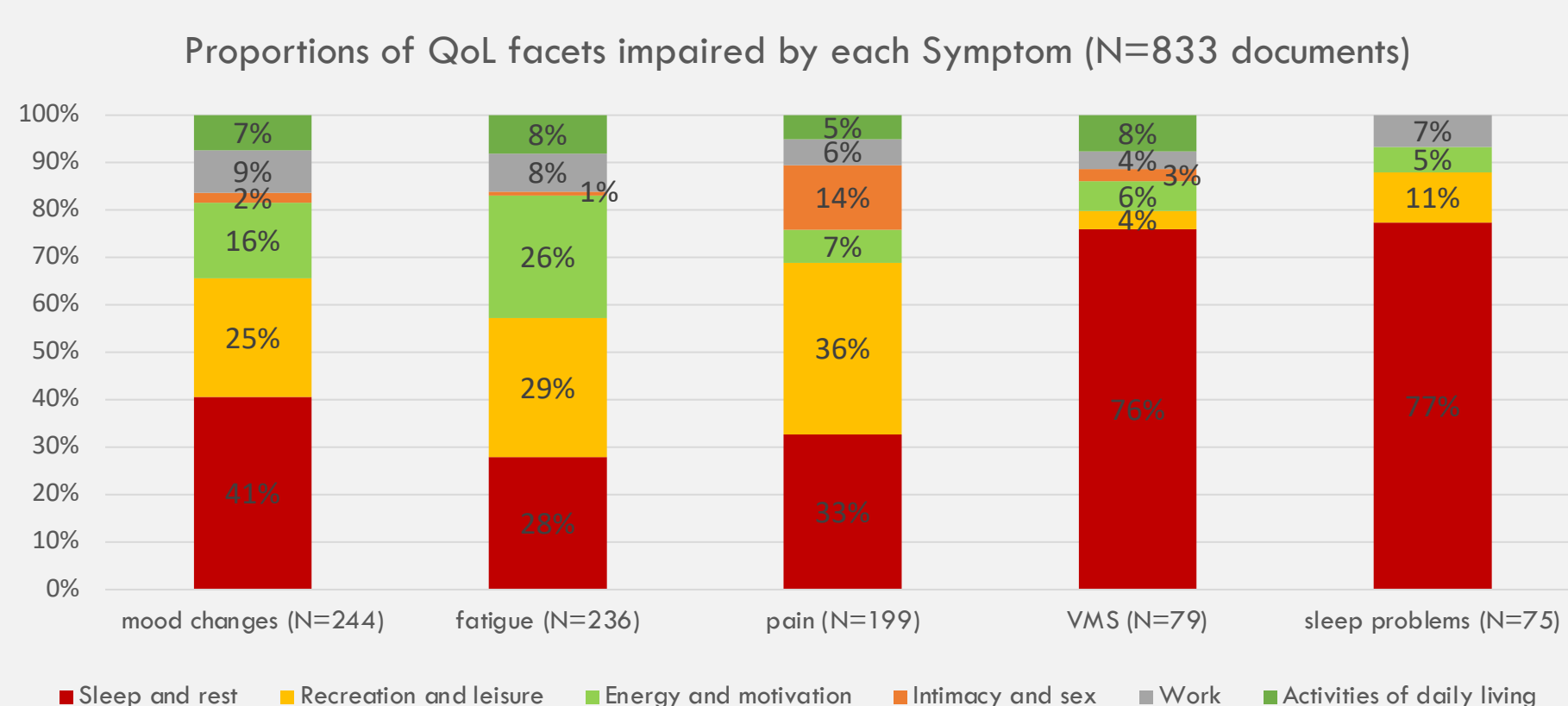
Table 1. Study data characteristics

Data set	N	%
No. of authors	13,953	100 %
No. of documents	154,704	100 %
Age (median: 49 years)	4,008	29%
NM&IM cohort – No. of authors		
NM	3,177	22%
IM	255	2%
Most mentioned QoL aspects (Top 5 most mentioned facets* in total data set)		
Recreation and leisure	4,206	22%
Sleep and rest	3,028	16%
Cognitive capabilities	2,213	12%
Energy and motivation	2,061	11%
Activities of daily living	1,384	7%

* Multiple mentions possible, total number (No.) of mentions of any QoL facet as denominator

QoL impairment

Figure 3. QoL impairment* by selected symptoms



*The negative impact of symptoms on a QoL facet was measured by an NLP analyzer capturing impairment relations of each symptom with every QoL facet as self-reported by women.

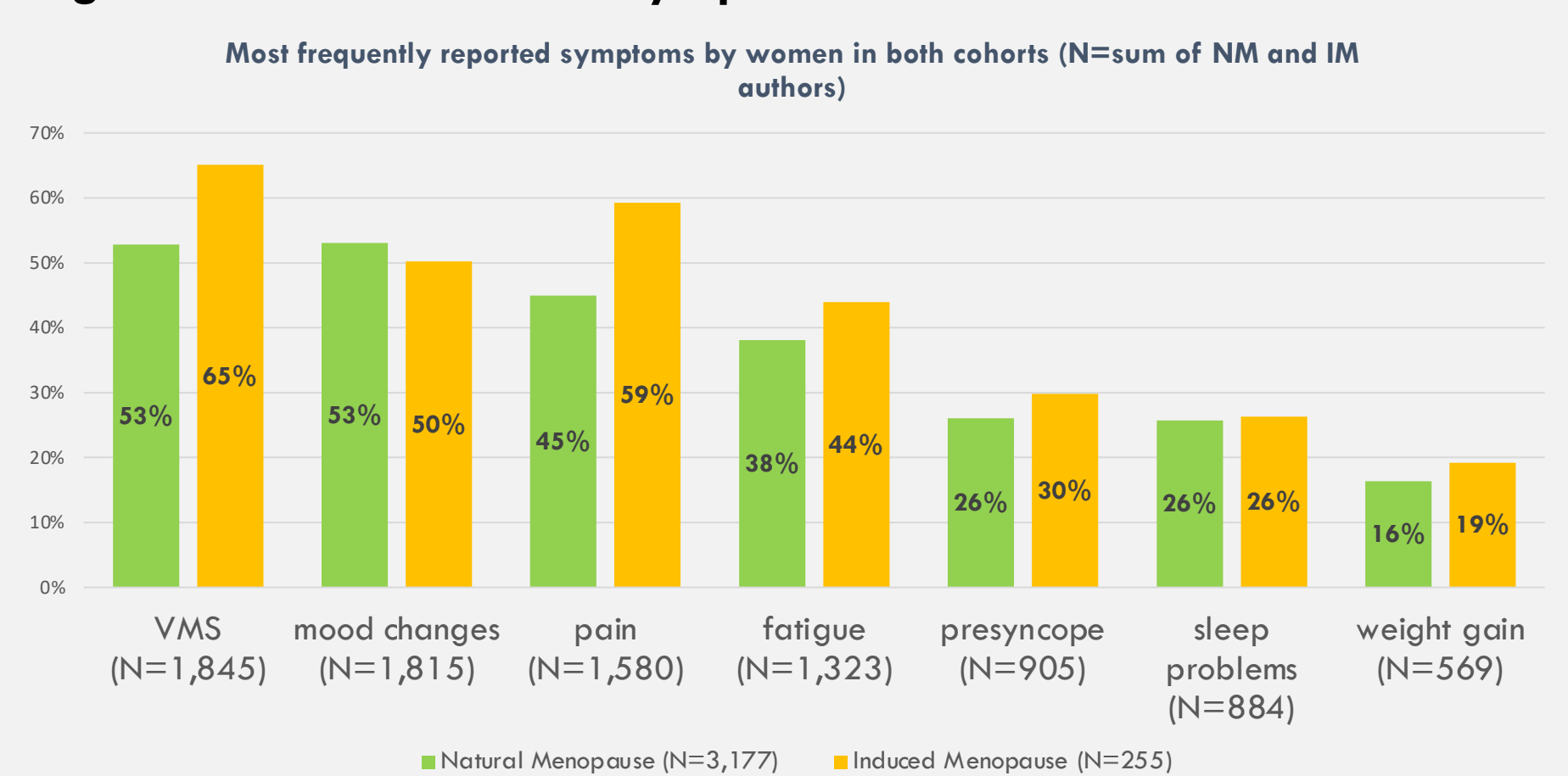
The most impaired QoL facets as reported by women (Fig. 3) were "Sleep and rest"- with VMS and mood changes strongly affecting this QoL aspect. Pain mainly impaired "Recreation and leisure" and fatigue mostly impacted "Energy and motivation". Together, these symptoms create a vicious cycle where poor sleep exacerbates menopausal symptoms, which in turn leads to even worse sleep, thereby severely tainting the quality of life, as reflected in many quotes.

Quotes

- "Poor sleep can make everything harder, and VMS makes sleep poor much of the time."
- "Hot flashes.....they were mild and under control then BAM! This week I am walking on the sun or feel like I am and nauseous to boot"
- "My bedtimes vary - anything from 9.30 up to 1am. I very rarely sleep through the night (thanks menopause!)"
- "My mood swings and emotional responses are wild"
- "Mood swings can lead to difficulty winding down at night or staying asleep through the night"

Symptom Burden

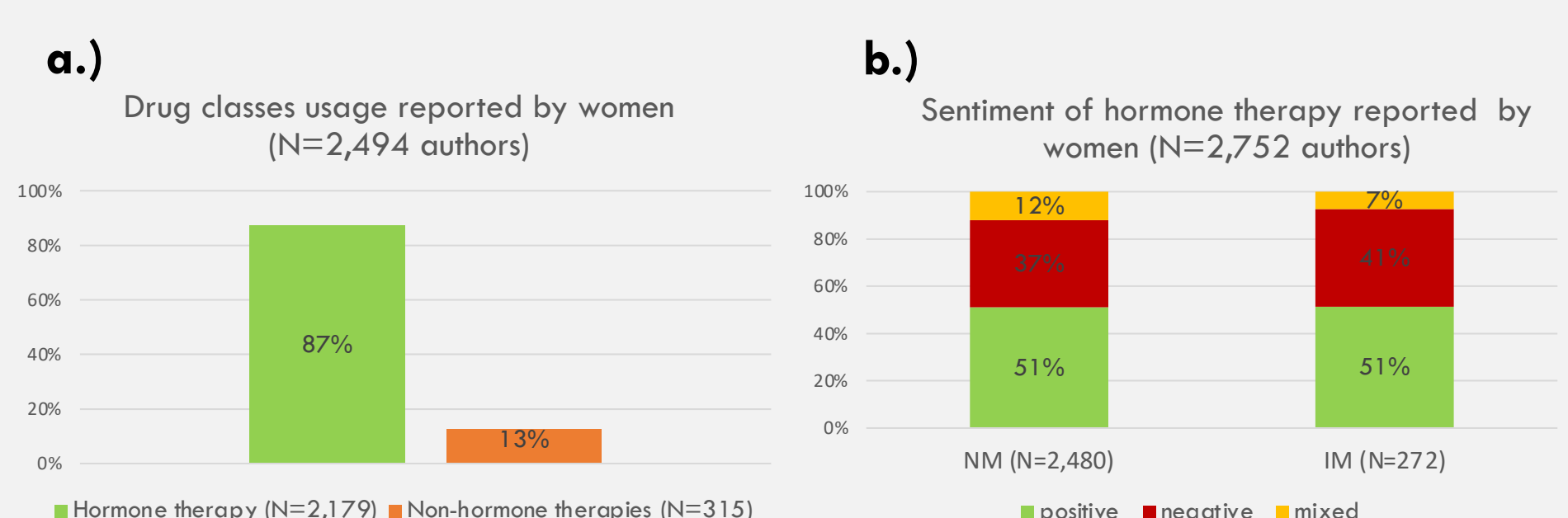
Figure 2. Most mentioned symptoms in NM and IM cohorts



Most frequently reported symptoms in both cohorts (Fig. 2) were VMS (vasomotor symptoms), mood changes, pain and fatigue. Percentages show the ratio of women with each symptom vs total number of women experiencing them within each cohort (NM or IM).

Treatment and Sentiment

Figure 4. a/b Hormone therapy usage and sentiment



The most common treatment mentioned by women in both cohorts was hormone therapy (Fig. 4a). Among those who mentioned using hormone therapy, around half of the entire study cohort reported either a mixed or negative sentiment towards these treatments (Fig. 4b)

CONCLUSIONS

Social listening provides valuable findings by delving into unbiased discussions from a diverse and large population of women with menopausal symptoms, understanding their unmet needs, challenges, and treatment sentiment, as well as evaluating the burden of disease and implications on their overall quality of life.

Menopausal symptoms such as VMS, mood changes, sleep problems, and physical discomfort significantly impair the quality of life of many women. Breaking this cycle of mutually reinforcing symptoms and impairments to improve overall well-being requires new and more comprehensive management and treatment strategies.

REFERENCES

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2. Spies E, Andreu T, Hartung M, Park J, Kamudoni P (2024): Exploring the Perspectives of Patients Living With Lupus: Retrospective Social Listening Study. JMIR Form Res 2024; 8: e52768.

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DISCLOSURES

- NS and SSS are employees of Bayer AG, Berlin, Germany. TA and MH are employees of Semalytix GmbH, Bielefeld, Germany.

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