The Representativeness of "People Also Ask" of Google Web Search on the Information Needs Concerning Alzheimer's Disease and Related Dementias

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BACKGROUND

Problems preventing to gain a whole picture of the information needs

01

Small Samples

The results are generally limited to small samples due to the high resources required in recruiting participants and analyzing qualitative data;

02

Incommensurable Data

It is challenging to relate the results of different studies based on the incommensurable data derived through different methodologies
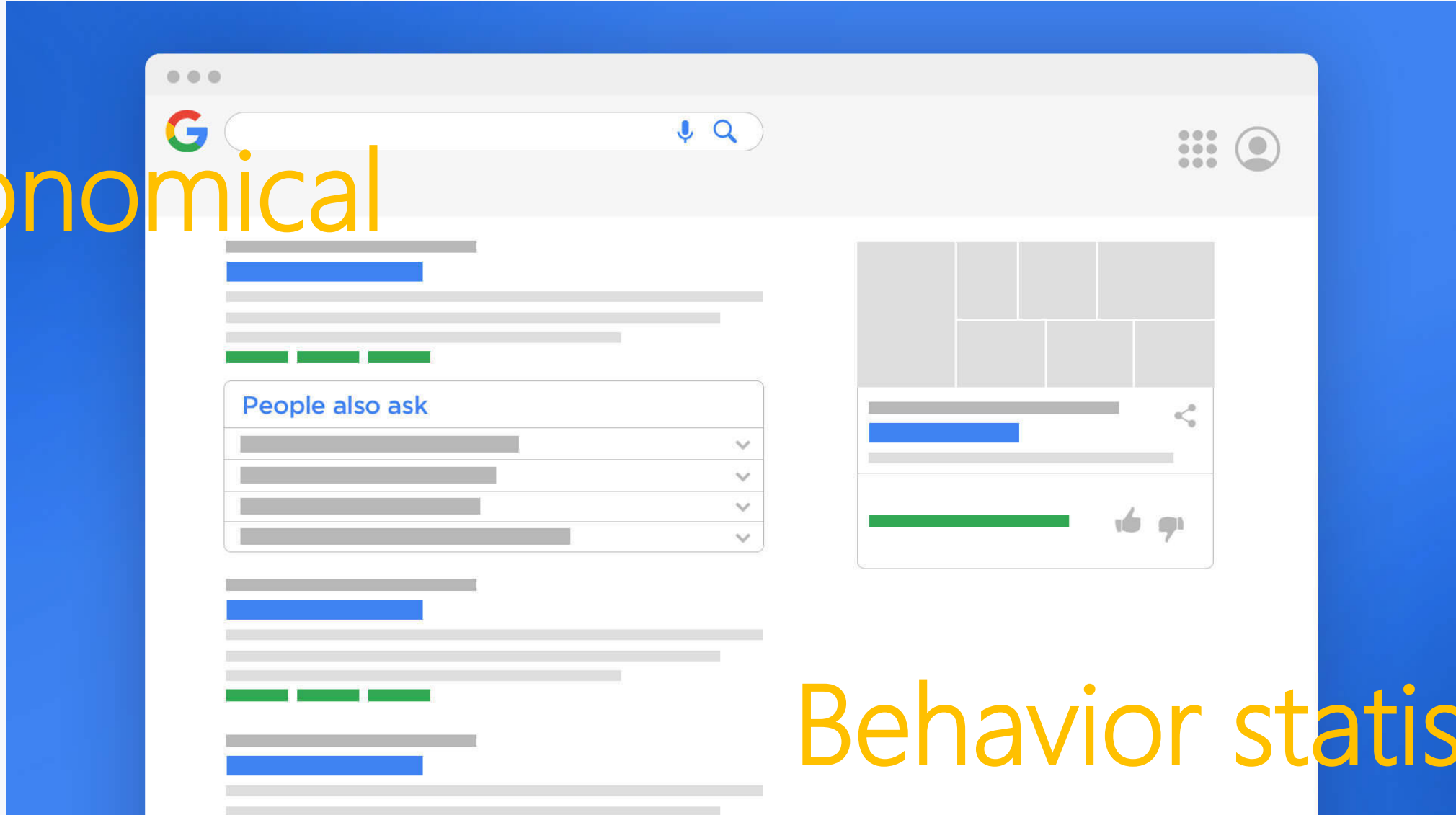
03

Bias & Errors

The results might carry bias and errors for the retrospective, self-reported studies.

OBJECTIVES

"People also ask" (PAA) applied machine learning models, RankBrain and BERT to identify search patterns, predict individual searches, and offer suggestions according to a search query.

Economical

Behavior statistics

C RESEARCH DESIGN

How much does PAA represent the review results?

Reviews

- Systematic & scoping review

- In the past three years

- Four themes, thirty-eight specific information needs from 50 original studies in total[1,2].

Review papers are:

1. Novais T, Dauphinot V, Krolak-Salmon P, Mouchoux C. How to explore the needs of informal caregivers of individuals with cognitive impairment in Alzheimer's disease or related diseases? A systematic review of quantitative and qualitative studies. BMC geriatrics. 2017;17(1):1-18.

2. Soong A, Au ST, Kyaw BM, Theng YL, Car LT. Information needs and information seeking behaviour of people with dementia and their non-professional caregivers: a scoping review. BMC geriatrics. 2020;20(1):1-17.

PAA

- Terms "dementia", "alzheimer's"

- Collection date: Jan 4th, 2021.

- For each term search result, click on each question on PAA for 100 questions orderly.

- 574 questions in total (282 for "dementia" and 292 for "alzheimer's"), downloaded by Scraper (v.1.7).

Data Collection Example: "dementia" 100 Times
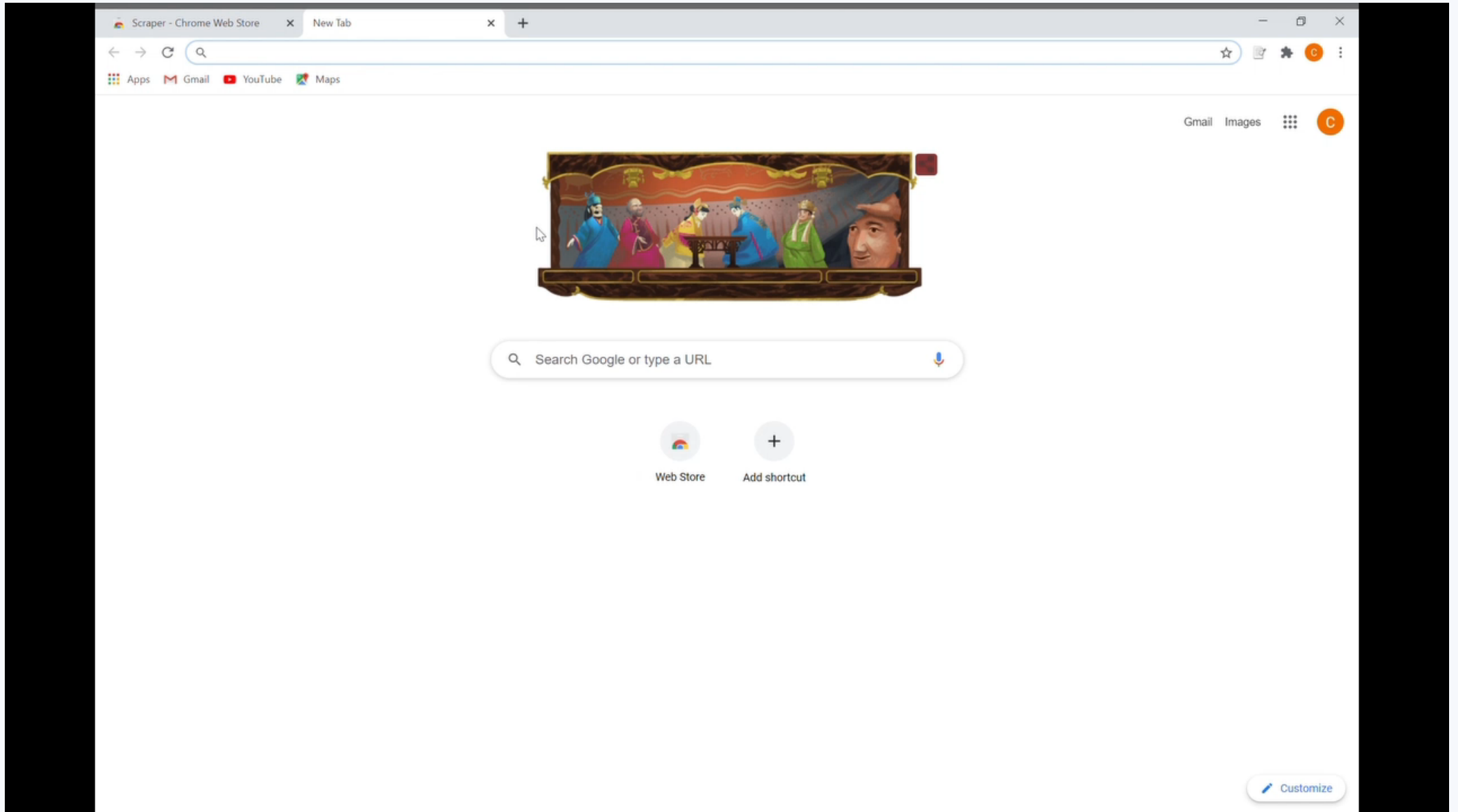
Theme	Information need	"dementia" Frequency, Percentage of 282	"alzheimer's" Frequency, Percentage of 292	Total Frequency, Percentage of 574
Disease-specific information	1.General information on ADRD	47, 16.67%	53, 18.15%	100, 17.42%
	2.ADRD Treatment	2, 0.71%	5, 1.71%	7, 1.22%
	3.Identifying and understanding ADRD eg. typical symptoms of ADRD/behaviour	90, 31.91%	101, 34.59%	191, 33.28%
	4.ADRD prognosis	12, 4.26%	21, 7.19%	33, 5.75%
	5.Current ADRD medication	4, 1.42%	2, 0.68%	6, 1.05%
	6.Experimental drugs/Clinical trials	2, 0.71%		2, 0.35%
	7.Current research on ADRD			0, 0.00%
	8.Genetic aspects of the disease		3, 1.03%	3, 0.52%
	9.Negative impact of ADRD on family and community	4, 1.42%	12, 4.11%	16, 2.79%
	10.Information specific to different stages of ADRD	12, 4.26%	15, 5.14%	27, 4.70%
	11.Chance of recovery	6, 2.13%	5, 1.71%	11, 1.92%
	12.Memory Skills	2, 0.71%	3, 1.03%	5, 0.87%
Patient Care Provision information	1.How to care for the patient eg. general care, patient hygiene, food and nutritional information, best attitudes to adopt in caring	51, 18.09%	29, 9.93%	80, 13.94%
	2.How to deal with patient's behaviour	11, 3.90%	9, 3.08%	20, 3.48%
	3.Safety issues eg. how to improve safety of environment, how to keep patient safe, how to recognise fall risks and poor mobility			0, 0.00%
	4.Coping with cognitive disorders	6, 2.13%	5, 1.71%	11, 1.92%
	5.Coping with patient feelings	7, 2.48%	3, 1.03%	10, 1.74%
	6.Communication difficulties and how to manage them	9, 3.19%	11, 3.77%	20, 3.48%
	7.Patient activities	8, 2.84%	5, 1.71%	13, 2.26%
	8.First aid and medical information		3, 1.03%	3, 0.52%
	9.Emergency situations			0, 0.00%
	10.Conflict resolution	3, 1.06%		3, 0.52%
	11.Patient Ethics	2, 0.71%		2, 0.35%
	12.Helpful experiences of other caregivers			0, 0.00%
	13.How to deal with family and friends			0, 0.00%
	14.How to advocate for patient		1, 0.34%	1, 0.17%
	15.When to transfer patient to hospital	4, 1.42%		4, 0.70%

Theme	Information need	"dementia" Frequency, Percentage of 282	"alzheimer's" Frequency, Percentage of 292	Total Frequency, Percentage of 574
Healthcare Service-related	1.Where and how to use services/help available e.g. geriatric hospitals, nursing homes, support groups, physicians skilled in diagnosis and treatment			0, 0.00%
	2.Financial estimate and help		1, 0.34%	1, 0.17%
	3.Legal issues			0, 0.00%
	4.How to apply for care programs eg. day care, long term care			0, 0.00%
	5.Insurance			0, 0.00%
	6.Home Help			0, 0.00%
	7.Transportation options			0, 0.00%
Caregiver self-care	1.Stress Management			0, 0.00%
	2.Carer's entitlements (pension)			0, 0.00%
	3.Managing emotions			0, 0.00%
	4.General caregiver self-care eg. exercise, diet, own medications			0, 0.00%
Unrelated			5, 1.71%	5, 0.87%

Themes percentages:

- Disease-specific information, 11/12=91.67%;

- Patient Care Provision information, 11/15=73.33%;

- Healthcare Service-related, 1/7=14.29%;

- Caregiver self-care, 0%.

CONCLUSIONS & FUTURE PLANS

The representativeness of PAA varied among the themes of information needs, possibly resulting from:

❖ PAA data & recommendation system with most asked questions

❖ Different usage habits on different platforms

PAA can be an efficient tool to identify specific areas of information needs

Examples: total joint arthroplasty (Shen et al., 2020), back pain, eczema, tooth decay & asthma (Pothirattanachaikul, Yamamoto et al. 2020)

• When you have topics, keywords or outlines

• When you want to know the most asked questions but not a complete list

• When you explore an area that people heavily rely on Internet searching, like some chronic diseases needing home care and management

Future work should investigate the patterns of which information needs PAA represents better than others.

Furthermore, we can explore combining behavior statistics from multiple aggregate search behavior tools (e.g., Google Trends, Alexa).

• Shen, T. S., Driscoll, D. A., Islam, W., Bovonratwet, P., Haas, S. B., & Su, E. P. (2020). Modern Internet Search Analytics and Total Joint Arthroplasty: What Are Patients Asking and Reading Online? The Journal of arthroplasty.
• Pothirattanachaikul, S., et al. (2020). Analyzing the Effects of "People also ask" on Search Behaviors and Beliefs. Proceedings of the 31st ACM Conference on Hypertext and Social Media. Virtual Event, USA, Association for Computing Machinery: 101–110.

THANKS!