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**Do not forget diet and exercise during Ramadan**

Ilias I *et al*. Interest in diet and exercise

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**Abstract**

We conducted an analysis of internet search trends spanning from January 2022 to June 2023 in the ten most populous Muslim countries. Our study focused on key terms, including the prominent GLP1 analog "ozempic™", as well as "diet", "exercise", and "diabetes". The findings revealed a substantial increase in searches for the GLP1 analog in eight countries. Concurrently, searches for "diet" and "exercise" predominantly exhibited a decline in nine and four countries, respectively. Notably, searches for "diabetes" displayed positive trends in only two countries. These patterns indicate a growing reliance on pharmaceutical interventions for managing diabetes and weight, often to the detriment of diet and exercise. Healthcare professionals and clinicians in Muslim countries should emphasize the importance of maintaining dietary and exercise regimens for patients with diabetes, even during the observance of Ramadan.

**Key Words:** Diet; Exercise; Diabetes; Internet; Ramadan

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**Core Tip:** An analysis of internet searches in ten populous Muslim countries revealed a notable rise in searches for a popular GLP1 analog. Meanwhile, searches for "diet" and "exercise" were mostly declining. This trend implies a growing preference for pharmaceutical solutions over diet and exercise in the management of diabetes or obesity, suggesting the need for healthcare professionals in Muslim countries to emphasize the importance of diet and exercise, including during Ramadan.

**TO THE EDITOR**

We read with interest the recent article by Ochani *et al*[1]. The authors emphasize the importance of incorporating diet and exercise into diabetes management, particularly during Ramadan. Additionally, they correctly endorse the use of GLP1 analogs, especially in individuals with diabetes who are taking sulfonylurea drugs and are at risk of hypoglycemia. In our own recent investigation[2], we observed a global decline in interest regarding diet and exercise, coinciding with a simultaneous increase in interest in GLP1 analogs, as evidenced by internet search trends.

To provide a more detailed explanation, we conducted an analysis of internet search trends using Google Trends™ (https://trends.google.com/trends/) covering the period from January 1, 2022, to June 30, 2023. Our focus was on data derived from the ten most densely populated Muslim countries, which represent roughly two-thirds of the global Muslim population (source: https://worldpopulationreview.com/country-rankings/muslim-population-by-country). Specifically, we examined search patterns related to the following keywords: "Ozempic"™ (recognized as the world's leading GLP1 analog[3]; produced by Novo Nordisk A/S, Bagsvaerd, Denmark), "diet,""exercise," and "diabetes." We confined our search to English-language terms, as our prior research indicated a substantial predominance of English-language searches over other languages[2].

Google Trends™ provides results in terms of Relative Search Volumes (RSVs), a metric employed by Google™ to signify the popularity or search interest in a given keyword or topic relative to the overall search volume on Google™ during a specific timeframe and in a specific location. RSVs offer a relative measure, showcasing how popular a particular search term is compared to all other searches conducted on Google during the same time and in the same place. RSVs are scaled from 0 to 100, with 100 signifying the peak popularity of a term within the selected time and location. It's crucial to note that Google Trends™ results are context-dependent, with RSV values subject to variation based on the chosen time frame (*e.g.*, day, week, year) and the specified geographical location (*e.g.*, country, state). To analyze the trends over time for the mentioned keyword parameters (measured in RSVs per week) in relation to time (measured in weeks), we applied a linear model separately for each country. For access to the study data, please refer to Zenodo (DOI: 10.5281/zenodo.8334806).

Throughout the study duration, we noted a surge in online searches for the GLP-1 analog across eight countries. Conversely, the trends for searches related to "diet" and "exercise" were predominantly negative, being observed in nine and four countries, respectively. Furthermore, internet searches for "diabetes" showed negative trends in four countries and positive trends in only two (Table 1).

These observations appear to indicate a pattern of overlooking crucial elements of a healthy lifestyle, notably diet and exercise, in favor of leaning on pharmaceutical solutions for managing diabetes and weight. Consequently, the global decline in interest in diet and exercise, coupled with the rising interest in GLP1 analogs, is evidently mirrored in Muslim countries as well.

In summary, we strongly advocate that clinicians and healthcare professionals in Muslim nations emphasize the significance of diet and exercise to individuals with diabetes, with no exceptions even during the observance of Ramadan.

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**Footnotes**

**Conflict-of-interest statement:** All the authors declare that they have no conflict of interest.

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**Table 1 Correlations (r) over time for internet searches by country (shown only for *P* < 0.05)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **“Diet”** | **“Exercise”** | **“Ozempic” ™** | **“Diabetes”** |
| Indonesia | -0.42 | -0.29 | +0.54 | -- |
| Pakistan | -0.40 | -- | +0.70 | -0.15 |
| India | -0.39 | -0.34 | -- | +0.24 |
| Bangladesh | -0.39 | -0.33 | +0.27 | -0.26 |
| Nigeria | -0.26 | -- | +0.81 | +0.25 |
| Egypt | -- | -- | +0.35 | -- |
| Iran | -0.47 | -0.42 | +0.37 | -0.33 |
| Turkey | -0.39 | -- | +0.84 | -- |
| Algeria | -0.37 | -- | +0.40 | -- |
| Sudan | -0.22 | -- | -- | -0.23 |



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