



## **"İQTİSADI İSLAHATLAR" elmi-analitik jurnal**

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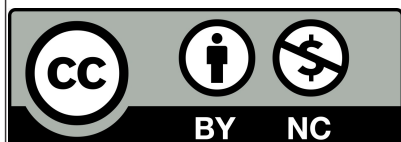


**№ 1(14)-2026**

səh. 97-110

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<https://doi.org/10.30546/2790-2196.01.14.2026.5027>



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# **SOCIAL MEDIA AND NATIONAL WELL-BEING: EVIDENCE FROM A CROSS-COUNTRY NON-PARAMETRIC ANALYSIS**

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## **ABSTRACT**

This study examines the cross-national relationship between a country's subjective well-being and its structural digitalization landscape, identifying the macro-digital characteristics that move in tandem with national happiness. Utilizing a quantitative, non-parametric correlational design, this study analyzes secondary data from a global sample (N=78). All variables were time-aggregated into a stable three-year mean (2022–2024). Well-being was evaluated via the World Happiness Report Mean Score, while the digital landscape was operationalized across social media penetration, gender demographics, and platform web traffic shares from DataReportal using Spearman's rank correlation ( $\alpha=0.05$ ). The empirical analysis revealed highly significant bivariate associations across four tested dimensions ( $p<0.01$ ). Broad digital inclusion showed a strong positive alignment, with active social media penetration correlating highly with happiness ( $\rho=0.718$ ). Gender metrics exposed a distinct structural divergence: female social media participation positively co-moves with well-being ( $\rho=0.501$ ), whereas dominant male usage patterns strongly associate with lower national happiness ( $\rho=-0.545$ ). Among platforms, only Instagram web traffic share yielded a significant positive co-movement ( $\rho=0.342$ ), while Facebook, Twitter, and LinkedIn footprints were statistically non-significant. Ubiquitous connectivity aligns with high well-being, but the specific demographic architecture and platform traffic flows serve as critical indicators of global societal development.

**Keywords:** *Subjective Well-Being; Social Media Penetration; World Happiness Report; Spearman Correlation*

**JEL code:** I31, O33, L86

## **INTRODUCTION**

In the contemporary global economy, digitalization has evolved from a supplementary technological luxury into a foundational structural paradigm that completely reshapes societal frameworks, communication networks, and macro-level development strategies. Over the past decade, international development frameworks have heavily

monitored the expansion of digital infrastructure and internet connectivity, frequently operating under the implicit assumption that widespread digital adoption naturally yields superior societal outcomes. However, while global benchmarks systematically track broad online access, there remains a critical empirical gap in understanding how the everyday digital ecosystems populated by citizens actually align with holistic measures of human development and national well-being.

Historically, macroeconomic evaluations of a nation's development relied almost exclusively on objective financial indicators, most notably Gross Domestic Product (GDP) per capita. While material output remains a core economic metric, it fails to capture the emotional, social, and cognitive dimensions of human life—realities increasingly measured through the lens of subjective well-being (SWB). To address this limitation, the World Happiness Report (WHR) has emerged as a globally recognized benchmark, aggregating self-reported life evaluations via the Gallup World Poll to measure the perceived quality of life across diverse cultural and geographic landscapes. Despite a growing body of literature examining the socioeconomic determinants of national happiness, research investigating how macro-level digital social spaces (specifically their overall penetration, gender compositions, and localized platform traffic market shares) interact with subjective well-being remains fragmented.

This study addresses this empirical gap by examining the cross-national connection between a country's time-aggregated subjective well-being and its macro-digital social landscape. Rather than treating social media adoption as a monolithic phenomenon, this research disaggregates national digital engagement into two multi-dimensional operational dimensions:

- ✓ Social Media Penetration and Demographics: Capturing broad public access through total active social media penetration rates, alongside a granular, gender-disaggregated look at active male versus female user distributions within the domestic digital sphere.
- ✓ Platform Web Traffic Share: Evaluating the specific digital environments where citizens congregate by tracking the macro-level web traffic share captured by prominent global platforms, including Facebook, Twitter, Instagram, and LinkedIn.

Methodologically, this study implements a quantitative, non-parametric correlational research design utilizing data from a global sample of nations ( $N = 78$ ). To ensure statistical dependability and insulate the findings from temporal volatility, short-term macroeconomic shifts, or annualized anomalies, all metrics are time-aggregated into a stable three-year mean spanning from 2022 to 2024. Crucially, given the highly integrated, bi-directional nature of technological diffusion and social development, this paper explicitly rejects rigid, unidirectional causal assumptions. Instead, it utilizes Spearman's rank correlation coefficient ( $\rho$ ) to map the underlying co-movements and systemic alignments defining the contemporary digital architecture of national well-being.

## **LITERATURE REVIEW**

### **History and development of The World Happiness Report (WHR)**

The World Happiness Report (WHR) began publication in 2012. The UN Sustainable Development Solutions Network developed it as a response to an international request for priority consideration of "happiness" and "well-being," that is, the recognition of "happiness" and "well-being" as integral parts of government decision-making processes. This marks a departure from strictly monetary-based measures such as GDP to broader measures of societal progress (Tofallis, 2020).

The idea behind developing the WHR came about as a result of Bhutan's Gross National Happiness approach; which recognized the evaluation of a nation's overall progress through the lens of "well-being." As such, the WHR is designed to analyze worldwide "happiness" and "well-being," using subjective life evaluations to be its primary measurement tool (Seymour, 2022; Tenhunen, 2020). The annual reports have continued since the inception of the WHR, usually released annually around March 20<sup>th</sup>, coincidentally International Day of Happiness. The reports evaluate the world's countries based on their level of "happiness" as well as identify the factors that contribute to each country's ranking (Alimahmad Bloch & Kyaw, 2025).

### **The Relationship Between Social Media and National Well-Being**

The relationship between social media use and the World Happiness Index (WHI) is complex and influenced by various factors, including the type of social media use, regional differences, and individual psychological processes.

Studies have shown that while social media usage, especially Facebook penetration, can increase an individual's overall level of happiness in specific contexts, the impact of social media on an individual's happiness differs across regions and at different levels of economic development; thus, the benefits of social media may not be equally distributed to all individuals (Avom & Yselle Malah, 2022). Additionally, research suggests that active engagement through social media (i.e., creating content or participating in meaningful exchanges) tends to have fewer negative effects than passive social media use (social media users engaging in non-meaningful ways i.e., social comparison), thereby resulting in higher levels of happiness (Ang, 2026). Use of social media can also be closely linked to social surrounding (Jamalova, 2021).

Negative associations have also been found to occur when users engage in excessive social comparisons on social media platforms, such as Instagram and Facebook. These social comparisons tend to decrease both an individual's overall level of happiness and his/her level of life satisfaction. In addition to decreasing happiness, excessive social comparison has also been known to decrease self-esteem (Chae, 2018; Wirtz et al., 2021). As stated previously, studies have shown that passive consumption of social media content (for example, passively viewing content on social media sites while doing nothing else) is positively correlated with both increased social comparison and decreased happiness. The manner in which one uses social media will therefore significantly affect one's overall experience with it (Ang, 2026). Finally, high levels of social media usage have been shown to result in lower happiness for

some individuals, specifically women and city dwellers. Additionally, these individuals may experience additional adverse psychological effects from social media usage. For instance, they may experience more anxiety and stress from using social media when they are experiencing difficulties, such as those experienced during the COVID-19 pandemic (Jarman et al., 2023; Khodabakhsh & Ahmadi, 2020).

However, social media use and happiness can vary greatly from country to country or regionally due to differences such as GDP per capita (Jamalova & Constantinovits, 2020), levels of social support and freedom (Jamalova & Constantinovits, 2021), and level of freedom of choice. Depressive Tweets are negatively correlated with happiness in those countries/regions that have less social support; however, Anti-Depressive Tweets are positively correlated with happiness in those countries/regions that have better economic indicators (GDP) (Avom & Yselle Malah, 2022). An increase in usage during the COVID-19 pandemic has been shown to be a predictor for lower overall well-being; however this is most prevalent in Latin America. Urban residents were seen to experience the greatest decline in well-being related to their social media usage (Caravaggio, 2024).

## **RESEARCH METHODOLOGY**

This study employs nonparametric correlation analysis that examines cross-country associations between countries' subjective wellbeing and their internal domestic social media use through a quantitative approach. Through the use of global data, this study evaluates how different countries' levels of happiness correlate with the rate of social media penetration, the gender distribution of users on social media, and how the global traffic of particular social media platforms varies from one another.

Since all of the variables in this type of design are considered equal indicators of similar structures/patterns/relationships versus being causal/cause-and-effect relationships, the correlational method used in this study identifies these structures/patterns. To evaluate the degree/strength and direction of the correlations between the pairs of variables, Spearman's rho ( $\rho$ ) (Hair et al., 2014) was used. Since nonparametric analyses are effective when dealing with monotonically related variables, and do not require normality of the data or the removal of outlier values from global indices, this study selected a nonparametric method.

The Null Hypothesis ( $H_0$ ), which is denoted by ( $H_0: \rho = 0$ ) indicates that there is no relationship between the variables measured in this study, whereas the Alternative Hypothesis ( $H_A$ ) denotes that there is a relationship among variables ( $H_A: \rho \neq 0$ ). Given that both hypotheses have been developed under a two-tailed test at an alpha level of  $\alpha = 0.05$ , both hypotheses are testable in terms of establishing whether there will be a positive or negative directional association.

### **Data Collection and Variables**

The data collection process consisted of collecting secondary macro-data level data for both variables in order to create an extensive cross-country database over a period of three

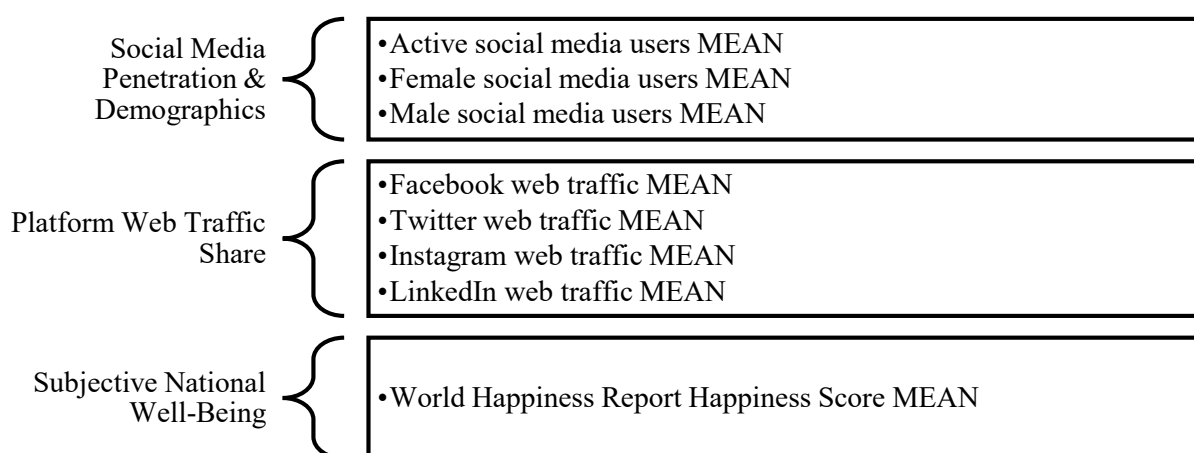
years (2022-2024). The total number of countries included within the sample totaled  $N = 78$ , and each country contained data for all key parameters. Due to the correlation nature of this research study, the variables were treated equally as indicators for examining co-movement among structures instead of establishing dependency among them.

Subjective assessments of overall happiness for countries are captured using the mean value of the World Happiness Report (WHR) Happiness Score. Subjective evaluations of happiness are measured using the Cantril Ladder Scale (0 to 10) on the Gallup World Poll. Two macro-dimensions are used to capture characteristics of the international digital environment. Social Media Penetration & Demographics include baseline adoption metrics such as Mean Active social media users, and granular demographics that measure average rates of female and male social media user activity (See Figure 1.). Platform Web Traffic Share is the second macro-dimension, and it measures the "footprint" of various digital platforms and quantifies average percentages of website traffic associated with four major digital platforms including Facebook, Twitter, Instagram, and LinkedIn. All variables were aggregated over a three-year time span to help reduce variability in the data collected annually and to identify general trends globally.

## Data Processing

To develop an organized process for creating a comparable data set that could be used for statistical evaluation, a formalized data processing protocol was developed. Secondary data metrics covering the years of 2022 through 2024 were first collected from the World Happiness Report (Helliwell et al., 2022, 2023, 2024) and DataReportal Summaries (We Are Social & Meltwater, 2022). The metric collection process utilized normalized country name(s) as the key relational identifier. After the collection of secondary data metrics, a formalized "cleaning" and selection process was established. All cases where one or more records had missing values were deleted using a list-wise delete method. Upon completion of the deletion process, a total of  $N = 78$  countries with all primary variables present in the operational datasets formed the final sample.

Fig. 1. Variables and data collection Source: Author's editing



Next, a temporal averaging procedure was applied to aggregate each variable over time (i.e., MEAN). The purpose of this temporal aggregation procedure was to reduce volatility associated with short-term events (e.g., local shocks), remove potential year-to-year variability associated with data collection methods, and provide a common basis for comparison across countries. Lastly, due to the nature of many global development indicators, these data sets violated the assumption of normality inherent in parametric statistics. Therefore, after the aggregation of time-series data, the rank order of each country's value on each indicator within the statistical software package was determined (Jamalova, 2024, 2026). This ranking facilitated the use of non-parametric procedures to evaluate relationships among indicators.

## Descriptive Statistics

The time-accumulated descriptive data show varying patterns across the globe for both the subjective well-being and the social media dynamics (See Table 1.). The WHR Happiness Score averages (N = 106) range from 1.995 to 7.789 globally, resulting in a medium-level global average of 5.688. For all three measures of digital activity (N = 96), there are considerable differences in adoption levels, with active social media users averaging 62.71%, however, they vary significantly at either end of the scale ranging from 5.17% to almost complete saturation of 97.27%. In relation to demographic characteristics of users, on average males' make-up approximately 2 percentage points more than females regarding relative number of users (mean: 52.23% vs. 46.38%; max.: 81.87% vs. 56.67%). The platform distribution demonstrates that clearly one company has substantially larger shares of web traffic when comparing the global averages across platforms. With respect to total social network sites traffic, Facebook (MEAN = 63.36%) by far dominates the digital landscape and is the largest player at each end of the scale (MEAN = 97.69%) and is followed at some distance by Twitter (MEAN = 9.43%), Instagram (MEAN = 8.33%), and LinkedIn (MEAN = .51%). Combining all variables into a single model results in a robust list-wise full sample size of 78 countries.

Table 1. Descriptive statistics

| Variables                      | N   | Minimum  | Maximum  | Mean     | Std. Deviation |
|--------------------------------|-----|----------|----------|----------|----------------|
| WHR Happiness score MEAN       | 106 | 1.9946   | 7.788633 | 5.688227 | 1.131086       |
| Active social media users MEAN | 96  | 5.166667 | 97.26667 | 62.71076 | 23.92411       |
| Female social media users MEAN | 96  | 15.13333 | 56.66667 | 46.38194 | 9.095651       |
| Male social media users MEAN   | 96  | 16.13333 | 81.86667 | 52.23472 | 9.459601       |
| Facebook web traffic MEAN      | 96  | 0        | 97.69    | 63.36375 | 22.31078       |
| Twitter web traffic MEAN       | 96  | 0        | 33.05333 | 9.429688 | 6.309252       |
| Instagram web traffic MEAN     | 96  | 0        | 36.04    | 8.327014 | 6.404824       |
| LinkedIn web traffic MEAN      | 96  | 0        | 4.55     | 0.514201 | 0.697446       |
| Valid N (listwise)             | 78  |          |          |          |                |

Source: author's own calculations

## RESULTS AND DISCUSSION

To evaluate the structural alignments between national well-being and the social media landscape, a Spearman's rank correlation analysis was executed ( $N = 78$ ). Because this study implements a correlational research design, the statistical outcomes reflect directional co-movements and bidirectional associations rather than causal dependencies. The empirical evaluations of the proposed hypotheses are detailed below, categorized by their statistical acceptance or rejection based on a two-tailed significance threshold ( $\alpha = 0.05$ ).

### Accepted Hypotheses

Highly significant relationships existed among the general usage, demographic characteristics, and social media platform's traffic share. Thus, the four primary hypotheses were validated at  $p < .01$  (See Table 2.).

- ✓ Hypothesis 1 (Baseline) – The Relationship Between Social Media Use and Measure of National Well-being - A relationship exists between Active social media users MEAN (baseline measure) and national happiness ratings ( $\rho = 0.718$ ,  $p < .001$ ), therefore, the alternative hypothesis is valid; high levels of social media use by a population have a direct effect on a nation's happiness. Unfortunately, previous studies (Detrinidad & López-Ruiz, 2024) discussed various economic, social, and environmental factors that influence the measurement of happiness; however they are not related to social media use. As result, the author cannot compare the findings with previous studies.
- ✓ Hypothesis 2 and Hypothesis 3 (Gender-Demographic Characteristic): The Relationship Between Women Using Social Media and Subjective Well-being - Women who participate in social media (Female social media users MEAN) are positively correlated with their subjective well-being ( $\rho = 0.501$ ,  $p < .001$ ); therefore, the alternative hypothesis is also valid. That is, nations whose citizens' women average greater rates of participation in social media tend to have higher subjective well-being ratings than other countries. The Relationship Between Men Participating in Social Media and Subjective Well-being - Men participating in social media (Male social media users MEAN) are negatively correlated with their subjective well-being ( $\rho = -0.545$ ,  $p < .001$ ); therefore, the alternative hypothesis is valid. This means that there is an inverse relationship between men participating in social media domestically and overall national happiness. Although a number of papers focus on similar subjects, including the connection between happiness and social media usage (Avom & Yselle Malah, 2022; Chae, 2018; Twigg et al., 2020), gender differences in happiness levels (Arrosa & Gandelman, 2016), and world-wide trends in gender-specific social media usage (Jamalova, 2026; Shahghasemi et al., 2025), none directly investigate the combined effects on happiness of the above-mentioned factors. On an international level, there are greater numbers of females who report higher levels of overall happiness than males, although, the degree to which the "happiness gap" exists depends upon each country and the way that men and women react to what they perceive as happiness-determining factors (Arrosa & Gandelman, 2016).

- ✓ Hypothesis 4 (Platform-Specific Metric): The Relationship Between Instagram Web Traffic Share and Subjective Well-being Ratings - Instagram was found to be one of two platforms exhibiting a moderate positive correlation between its web traffic share (Instagram web traffic MEAN) and national well-being ( $\rho = 0.342$ ,  $p = 0.002$ ); therefore, the alternative hypothesis is also valid. That is, an increase in visual lifestyle-based traffic share from Instagram within a country has a corresponding increase in that nation's happiness. Some authors (Acharya et al., 2025) found that Instagram use affects Nepali students' comparisons to others and feelings of being alone. However, it does not have a direct influence on their happiness. Others (Qamar & Ali, 2026) explored how Pakistani university students are affected by Instagram use, demonstrating an effect on self-esteem and levels of depression; yet, no direct effects were found for students' happiness or WHR scores.

Table 2. Correlation Analysis:  
Social Media use and WHR results

| Hypothesis   | Tested Relationship<br>(Averaged 2022–2024)                                  | Spearman's $\rho$ | p-value | Empirical Status |
|--------------|------------------------------------------------------------------------------|-------------------|---------|------------------|
| Hypothesis 1 | WHR Happiness Score MEAN $\leftrightarrow$<br>Active social media users MEAN | 0.718             | < 0.001 | <b>Accepted</b>  |
| Hypothesis 2 | WHR Happiness Score MEAN $\leftrightarrow$<br>Female social media users MEAN | 0.501             | < 0.001 | <b>Accepted</b>  |
| Hypothesis 3 | WHR Happiness Score MEAN $\leftrightarrow$<br>Male social media users MEAN   | −0.545            | < 0.001 | <b>Accepted</b>  |
| Hypothesis 4 | WHR Happiness Score MEAN $\leftrightarrow$<br>Instagram web traffic MEAN     | 0.342             | 0.002   | <b>Accepted</b>  |
| Hypothesis 5 | WHR Happiness Score MEAN $\leftrightarrow$<br>Facebook web traffic MEAN      | −0.172            | 0.131   | <b>Rejected</b>  |
| Hypothesis 6 | WHR Happiness Score MEAN $\leftrightarrow$<br>Twitter web traffic MEAN       | 0.214             | 0.060   | <b>Rejected</b>  |
| Hypothesis 7 | WHR Happiness Score MEAN $\leftrightarrow$<br>LinkedIn web traffic MEAN      | 0.189             | 0.097   | <b>Rejected</b>  |

Source: author's own calculations

## Rejected Hypotheses

The empirical analyses did not find a statistically significant difference at the specified  $\alpha$  level for the remaining platform-specific digital ecosystems, thus rejecting three alternative hypotheses (See Table 2).

- Hypothesis 5 (Facebook Ecosystem Traffic) - The Relationship Between Facebook Ecosystem Traffic and Measure of National Well-being - Although the correlation between Facebook's average Web traffic and the World Happiness Report (WHR) happiness score had a negative coefficient (-0.172), it lacked sufficient statistical significance to reject the null hypothesis ( $p = 0.131$ ); therefore, there is insufficient evidence that Facebook's market share has monotonically moved in sync with national well-being. Previously The relationship between Facebook penetration and global levels of happiness is explored by researchers (Avom & Yselle Malah, 2022) with an overall positive correlation that exists but is not universal and is affected by both the level of economic development and regional differences. Therefore, the difference between the results of these studies can be easily justified.
- Hypothesis 6 (Twitter Ecosystem Traffic) - The Relationship Between Twitter Ecosystem Traffic and Measure of National Well-being - There was a positive trend of the association for Twitter's average Web traffic; however, this association fell just short of achieving the necessary threshold for statistical significance ( $p = 0.214$ ;  $p = 0.060$ ); therefore, although the association suggested that changes in Twitter's traffic footprint have been positively associated with national happiness scores, there is not enough reliable data to support that claim. Thus, we can conclude that the variation in Twitter's traffic footprint has not reliably co-aligned with national happiness scores.
- Hypothesis 7 (LinkedIn Ecosystem Traffic) - The Relationship Between LinkedIn Ecosystem Traffic and Measure of National Well-being - LinkedIn's average Web traffic exhibited a very small and not statistically significant positive association with national well-being ( $p = 0.189$ ;  $p = 0.097$ ); as such, we are able to conclude that there is insufficient evidence to suggest that macro-level professional networking traffic shares through LinkedIn will co-move with national subjective well-being.

## CONCLUSION

The study measured the cross-country relationships between the digital social structure and subjective well-being for a global sample ( $N = 78$ ) using a reliable, three-year, time-aggregated dataset from 2022-24. Given that it was designed as a correlational, non-parametric study, it was able to provide a mapping of the co-movements of systems without assuming unidirectional causal effects. This data indicated strong associations between large-scale digital connectivity and human-centered development. Specifically, there was a robust association between the percentage of population actively engaged with social media and national happiness scores ( $p = 0.718$ ). The main contribution of this research, however, was to show

that what matters most about a country's digital environment is how it is structured internally, not just simply how much access exists. By examining the demographics behind social media use, researchers were able to find a stark divide in how women's versus men's usage of social media relates to societal well-being. Higher levels of women participating in social media compared to men were found to be associated with greater societal well-being ( $\rho = 0.501$ ); whereas high levels of men-only participation in social media were associated with lower levels of national happiness ( $\rho = -0.545$ ). Researchers also analyzed different types of digital environments and found that they do not function uniformly. Only Instagram web traffic share showed an association with national well-being ( $\rho = 0.342$ ) indicating that visual lifestyle-based social capital is specifically associated with higher levels of well-being; whereas Facebook, Twitter, and LinkedIn (legacy, text-based, and professional platforms respectively) did not display such an association. Overall, these findings support the idea that a country's digital environment can be directly related to the level of subjective well-being within that country, yet it is connected through who is accessing those digital environments and which ones they choose to visit. As such, if policymakers are interested in promoting long-term global development, it may be important to look past providing access to internet and consider other ways to promote inclusion and balance in their digital environment.

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# SOSIAL MEDIA VƏ MİLLİ RİFAH: ÖLKƏLƏRARASI QEYRİ-PARAMETRİK TƏHLİLDƏN DƏLİLLƏR

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## XÜLASƏ

Bu tədqiqat kəmiyyət əsaslı qeyri-parametrik korrelyasiya analizindən istifadə edərək, ölkənin subyektiv rifahı ilə onun struktur rəqəmsallaşma göstəriciləri arasındakı əlaqəni araşdırır və milli xoşbəxtliklə paralellik təşkil edən rəqəmsal xüsusiyyətləri müəyyən etməyi hədəfləyir. Bütün dəyişənlər zaman üzrə aqreqasiya edilərək üçillik orta göstəriciyə (2022–2024) gətirilmişdir. Rifah səviyyəsi Ümumdünya Xoşbəxtlik Hesabatının Orta Balı vasitəsilə, rəqəmsal göstəricilər isə "DataReportal" hesabatlarından əldə edilən sosial media istifadəsi, gender demoqrafiyası və platformaların veb-trafik payları üzrə Spirmenin korrelyasiya analizi tətbiq olunaraq qiymətləndirilmişdir. Empirik təhlil dörd göstərici üzrə yüksək dərəcədə əhəmiyyətli ikidəyişənli əlaqələri ortaya çıxarmışdır ( $p < 0.01$ ). Geniş rəqəmsal əlçatanlıq güclü müsbət əlaqə nümayiş etdirmiş, fəal sosial media istifadəsi xoşbəxtliklə yüksək korrelyasiya təşkil etmişdir ( $\rho = 0.718$ ). Gender göstəricilərində struktur fərqlilikləri üzə çıxarılmışdır: qadınların sosial mediada iştirakı rifahla müsbət istiqamətdə hərəkət etdiyi halda ( $\rho = 0.501$ ), kişilərin üstünlük təşkil etdiyi istifadə modelləri milli xoşbəxtliklə daha yüksək, lakin əks istiqamətdə əlaqələnir ( $\rho = -0.545$ ). Platformalar arasında yalnız "Instagram" veb-trafik payı əhəmiyyətli müsbət istiqamətli əlaqə nümayiş etdirmişdir ( $\rho = 0.342$ ), "Facebook", "Twitter" və "LinkedIn" göstəriciləri isə statistik olaraq əhəmiyyətsizdir. Hər yerdə mövcud olan şəbəkə bağlantısı yüksək rifahla əlaqələnirsə də, spesifik demoqrafik arxitektura və platforma əsaslı istifadə global sosial inkişafın mühüm indikatorları kimi özünü göstərir.

**Açar sözlər:** subyektiv rifah, sosial media mənimsənilməsi, Ümumdünya Xoşbəxtlik Hesabatı, Spirmen korrelyasiyası

**Məqalə redaksiyaya daxil olub: 28.04.2026**

**Təkrar işlənməyə göndərilib: 09.06.2026**

**Çapa qəbul olunub: 30.07.2026**

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