

# Digital Media Literacy and Misinformation in Rural Uttarakhand: Insights from Empirical Data

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**1.Introduction-**The unchecked rise of misinformation on social media has emerged as a critical threat to information integrity, democratic discourse, and public trust. This challenge is particularly acute in regions experiencing rapid digital expansion, such as the Indian state of Uttarakhand. With advancements in mobile technology, widespread availability of affordable smartphones, and declining data costs, internet access has surged across both urban and rural populations. According to official data published on [data.gov.in](https://data.gov.in), the rural internet user base in Uttarakhand now stands at approximately 4.9 million—closely matching the 4.95 million users in urban areas.<sup>1</sup> This statistical near-parity highlights a significant narrowing of the digital divide and signals a transformative shift in the way rural populations engage with digital platforms, particularly social media.

However, this increasing connectivity comes with complex challenges. Social media platforms—once hailed for democratizing communication—have now become prime vectors for the spread of misinformation and fake news. The reasons are multifaceted: algorithm-driven content curation, lack of editorial oversight, and the ease of creating and sharing unverified or manipulated information. Advanced technologies, including artificial intelligence, deepfake generators, and sophisticated editing tools, have made it easier than ever to produce deceptive content that appears authentic. In such an environment, even digitally connected individuals are at risk of being misled, especially when media literacy is low.

A recent study by the Indian Business School in partnership with CyberPeace Foundation (IANS, Dec 20, 2024) underscores the alarming spread of misinformation in India. The report found that nearly half of all fake news stories circulating online are political in nature. The study strongly recommends enhancing digital media literacy, strengthening user reporting mechanisms, and encouraging responsible online behavior to mitigate this rising threat.<sup>2</sup> This becomes even more pressing in rural areas where exposure to social media has increased, but the ability to critically evaluate content remains limited. There have been numerous documented cases where

viral misinformation has triggered serious consequences—

fuelling rumours, inciting violence, or undermining public health initiatives. In certain situations, misinformation has spread so rapidly and uncontrollably that local or state governments have resorted to suspending internet services altogether in an attempt to curb unrest and restore order. These shutdowns, while often seen as a last resort, disrupt essential services, education, and communication, particularly harming already vulnerable rural communities. Seeing the growing AI generated content increasing on the internet the Standing committee on Communication and Information Technology has submitted a draft report in which it has suggested mandatory licencing and labelling of AI generated content to distinguish it from genuine content and also asked the media organisations to strengthen their fact checking systems.<sup>3</sup>

Rural internet users typically engage with social media for various purposes—ranging from entertainment and social connection to information gathering. However, their content consumption is largely unstructured and dictated by platform algorithms rather than deliberate information-seeking behaviour. This algorithmic reinforcement fosters echo chambers<sup>4</sup>, where users are repeatedly exposed to the same types of content and viewpoints, while alternative or dissenting voices are filtered out. Over time, this digital insulation amplifies biases, promotes misinformation, and erodes trust in credible sources.

Given this backdrop, the role of media literacy becomes more vital than ever. Media literacy is not merely the ability to use digital tools; it is the skill to critically assess, analyze, and question the content one consumes. It encompasses competencies such as fact-checking, source verification, understanding media motives, and recognizing bias or manipulation. In rural settings, where formal education systems may not adequately address these areas, the lack of media literacy leaves populations especially vulnerable to digital misinformation.

This paper seeks to evaluate the media literacy levels of rural internet users in Uttarakhand and understand the real-world impact of misinformation on

their lives. It investigates how misinformation spreads through social networks, how users perceive and interact with such content, and what gaps exist in their ability to identify and respond to false information. The study ultimately argues for a structured and localized approach to digital media literacy as a necessary defense against the growing tide of misinformation, and as a pathway to more informed, resilient, and empowered rural communities.

## 2. Review of literature

### Media Literacy: Definitions and Frameworks

Media literacy has evolved beyond traditional notions of understanding mass media to encompass critical engagement with digital content across various platforms. According to UNESCO (2011), media and information literacy (MIL) is the set of competencies that empowers citizens to access, retrieve, understand, evaluate, and use information ethically and effectively. It further includes the ability to analyze media messages, create content responsibly, and engage in informed digital participation. In an age where information is abundant and rapidly disseminated through algorithmic feeds, these competencies are essential for democratic participation and safeguarding against manipulation.<sup>5</sup>

Academic literature reinforces this expanded framework. Hobbs (2010) defines media literacy as the capacity to access, analyze, evaluate, create, and act using all forms of communication.<sup>6</sup> Similarly, Potter (2013) argues that media literacy should involve “a continuum of skills” including cognitive, emotional, aesthetic, and moral dimensions, not just technical proficiency. The consensus across these definitions is that media literacy is not merely about digital access, but about the quality of engagement with media content.<sup>7</sup>

### Key components of media literacy include:

**Analysis** – Interpreting messages, understanding underlying meanings, and identifying biases.

**Evaluation** – Judging credibility and reliability of sources.

**Content creation** – Generating and sharing information ethically.

**Critical thinking** – Questioning assumptions, motives, and implications.

**Fact-checking** – Verifying accuracy using credible sources.

Despite this consensus, implementation of media literacy programs—particularly in rural areas—remains sparse and unstandardized. Many existing interventions focus on urban or school-based populations, leaving rural adults, informal workers, and the elderly under-researched and underserved.

## Misinformation and Its Impact

Misinformation is broadly defined as false or misleading information shared without the intent to deceive, although its consequences can be just as harmful as deliberate disinformation. The spread of misinformation has been extensively studied in the context of key social events.

During elections, for instance, false narratives have been shown to polarize voters and manipulate public opinion. A study by Faris et al. (2017)<sup>8</sup> found that politically motivated misinformation during the 2016 U.S. elections spread faster and wider than factual content. In India, political fake news is also prevalent, with a 2024 study by the Indian Business School and CyberPeace Foundation reporting that nearly 50% of misinformation online is political in nature (NDTV, 2025).<sup>2</sup>

The COVID-19 pandemic intensified the infodemic—defined by the WHO as an overabundance of information, including falsehoods—leading to public confusion, vaccine hesitancy, and stigmatization. Research by Brennen et al. (2020)<sup>9</sup> at the Reuters Institute identified health-related misinformation as a major global issue, exacerbated by WhatsApp forwards and unverified YouTube content in countries like India.

Natural disasters have also been fertile ground for misinformation. After the 3 August 2025 Dharali flash floods in Uttarakhand, numerous fake claims were made through social media, creating confusion.<sup>10</sup>

Psychologically, misinformation exploits cognitive biases like confirmation bias and availability heuristics, making individuals more likely to believe and share content aligned with their existing beliefs (Penneycook & Rand, 2018).<sup>11</sup>

Socially, misinformation undermines trust in institutions and media, deepens polarization, and can incite violence or discrimination.

### Digital Divide and Rural Internet Use-

The digital divide has traditionally been viewed through the lens of access—the availability of devices, internet connectivity, and digital infrastructure. While significant progress has been made in bridging this access gap in India through initiatives like Digital India and BharatNet, a second layer of the divide persists: the skills divide.

Van Dijk (2005) distinguishes between material access and usage capabilities. In rural India, while smartphones and mobile internet are increasingly ubiquitous, meaningful use remains limited by low digital literacy, poor quality of content in local languages, and lack of training.<sup>12</sup> A report by IAMAI (

2023) highlights that while 45% of rural users in India access the internet daily, only 12% are able to critically evaluate the information they consume.<sup>13</sup>

Several programs have attempted to address this skills gap. Initiatives like the Digital Literacy Mission and Google's Internet Saathi (now concluded) aimed to train women and rural users in basic digital skills. However, evaluations reveal that these programs often focus on functional literacy—how to use a phone or app—rather than critical engagement with online content.

Moreover, rural populations face algorithmic discrimination. Social media platforms' content delivery systems are often optimized for engagement rather than truth, creating echo chambers where misinformation thrives. The lack of tailored, culturally contextualized media literacy education deepens these risks.

### Research Gaps

Despite a growing body of research on misinformation and digital engagement, several critical gaps remain, particularly in the Indian context:

1. **Limited rural focus** – Most media literacy studies are concentrated in urban or semi-urban settings, with minimal exploration of rural digital behaviors and vulnerabilities.
2. **Functional vs. critical literacy** – Existing digital literacy programs emphasize tool usage rather than critical thinking, source verification, or content evaluation.
3. **Lack of impact studies** – Few empirical studies investigate how misinformation specifically affects rural populations in terms of behavior, decision-making, or community outcomes.
4. **Contextual void** - There is a lack of localized, culturally relevant media literacy frameworks that consider linguistic diversity, educational levels, and socio-political realities of rural users.

### 3 Methodology

#### Research Design

This study employed a descriptive survey-based research design to evaluate media literacy and misinformation exposure among rural internet users. A structured questionnaire was developed and administered to collect primary data from respondents across 25 villages in Narendranagar Tehsil, located in Tehri Garhwal district, Uttarakhand. The survey aimed to generate empirical insights into rural digital behaviour, misinformation awareness, and engagement with media platforms. The study specifically addressed the following research objectives:

1. To assess social media usage patterns among rural internet users.

2. To identify and analyse active versus passive digital behaviour.

3. To evaluate awareness of fake news and the presence or absence of fact-checking skills.

4. To explore the extent of understanding of policy frameworks related to misinformation and digital regulation.

#### Study Area and Sampling

The research was conducted across 25 purposively selected villages within Narendranagar Tehsil, ensuring representation from different geographic clusters, connectivity levels, and socio-economic profiles. A stratified random sampling method was used to select participants within each village, ensuring representation across age, gender, education, and frequency of internet use. From each village, 10 respondents were selected, resulting in a total sample size of 250 respondents.

- The inclusion criteria were as follows:
- Respondents aged 18 years or above
- Residents of the selected village for at least six months
- Regular social media users

#### Data Collection Instrument

A structured questionnaire was prepared in Hindi, and pre-testing was done to ensure clarity, relevance, and cultural appropriateness. Moreover, two research assistants who were fluent in Garhwali language, spoken locally in the selected area, were appointed. This aided in overcoming the language barrier and creating favourable circumstances for data collection. After necessary revisions, the final version was used for data collection.

The questionnaire comprised five thematic sections:

#### Demographic Profile

Collected data on age, gender, education, occupation, income, and device ownership.

#### Social Media Usage

Explored platforms used (e.g., WhatsApp, Facebook, Instagram), frequency and duration of use, and primary motivations (e.g., news, entertainment, learning).

#### Active vs. Passive Use

Captured the extent of user participation—such as posting, commenting, liking, sharing, and content creation—to categorize users as active or passive.

#### Fake News Awareness and Fact-Checking Skills

Assessed familiarity with misinformation-related terms, ability to identify unreliable content, and use of tools or techniques for fact verification.

#### Policy Framework Awareness

**Gauged knowledge of governmental and platform-based misinformation interventions** (e.g., IT Rules 2021, PIB Fact Check), and attitudes toward regulation and accountability.

**Data Analysis**

To analyse data collected from the 250 completed surveys, the following techniques were applied:

- Descriptive statistics were used to summarize demographic data, usage behaviour, and levels of awareness.
- Cross-tabulation helped identify patterns and relationships between user profiles and media literacy competencies.
- Chi-square tests were conducted to assess statistical significance across categories such as age groups and fact-checking behaviour.
- A composite Media Literacy Index (MLI) was constructed using weighted scores from key indicators such as source evaluation, fact-checking habits, and misinformation recognition.

**Ethical Considerations**

Ethical guidelines were strictly followed throughout the study:

- Informed consent was obtained from all participants prior to administering the survey.
- Anonymity and confidentiality were maintained; no identifying information was collected.
- Participation was voluntary, and respondents had

important because it demonstrates that the sample is not restricted to one narrow age group, but instead captures both younger and older rural internet users. Such diversity strengthens the validity of findings on digital behaviours and misinformation exposure.

Gender. Female = 128 (51.2%), Male = 122 (48.8%) (N = 250).

$$p_k = \frac{f_k}{n}, \quad f_k = \text{count in category } k$$

- $f_k$  = Frequency count of category  $k$  (number of respondents in category  $k$ )
- $p_k$  = Proportion (relative frequency) of category  $k$  in the total sample
- $k$  = Category label (e.g., "1 hour," "2 hours" in time-spent variable)

**Social media usage patterns**

**Platform adoption.** All respondents reported using social media [Yes = 250/250]. WhatsApp usage was universal. [Yes = 250/250].

**Formula (categorical frequency & proportion):**

$$f_k, \quad p_k = \frac{f_k}{n}$$

Wherein

- $f_k$  = Frequency count of category  $k$ . The number of respondents who fall into category  $k$ . Example: If 138 people report "1 hour of social media use," then  $f_k = 138$ .
- $p_k$  = Proportion (relative frequency) of category  $k$ . The share of the total sample belonging to category  $k$ . Example:  $p_k = \frac{138}{250} = 0.552 = 55.2\%$
- $n$  = Total number of respondents (sample size). In the present study,  $n = 250$ .
- $k$  = Category label. A specific option within the variable being measured (e.g., "1 hour," "2 hours," "3 hours" for *time spent*).

**Result: Time spent daily.** 1 Hour = 138 (55.2%); 2 Hours = 75 (30.0%); 3 Hours = 37 (14.8%) (N = 250).

Near-universal adoption and regular daily use place rural users in sustained contact with algorithmic feeds—conditions known to increase incidental exposure to misinformation. This mirrors national patterns reported by IAMAI (2023)<sup>13</sup> and global work showing social media’s role as a primary news channel (Tandoc et al., 2018).<sup>14</sup>

**Active vs. passive behaviour**

We classified “active” users as those who either (i) share others’ posts (Yes), or (ii) report sharing  $\geq 3$  posts per day. Everyone else was classified as “passive.”

- Shares others’ posts: Yes = 150 (60.0%); No = 100 (40.0%).
- Posts shared per day: One–Two = 171 (68.4%); Three–Four = 66 (26.4%); Five–Six = 12 (4.8%); None = 1 (0.4%).
- Composite activity classification: Active = 179 (71.6%); Passive = 71 (28.4%).

Although a majority qualify as “active” by sharing/forwarding behavior, original content creation remains low (the “create” field is dominated by topical labels; only 1 respondent marked “No”). This pattern—*forwarding-heavy, creation-light*—is consistent with evidence that passive/semi-active forwarding accelerates the spread of misinformation (Pennycook & Rand, 2018)<sup>11</sup> and with rural consumption patterns observed by Pew Research Center (2021).<sup>15</sup>

**Awareness of Fake News and Fact-Checking**

- Awareness that fake news circulates: Yes = 201 (80.4%), No = 49 (19.6%).
- Awareness of fact-checking methods: Yes = 40 (16.0%), No = 210 (84.0%).
- Experienced consequences of fake news: Yes = 40 (16.0%), No = 210 (84.0%).
- Named a fact-check site (e.g., AltNews, BOOM):  $\approx 25$  (10.0%).

**Chi-square test of association**

To test whether awareness of fake news is associated with awareness of fact-checking methods, a Chi-square test of independence was conducted.

**Observed contingency table (O):**

	Fact-check: No	Fact-check: Yes	Row total
Fake news: No	42	7	49
Fake news: Yes	168	33	201
Column total	210	40	250

**Expected frequencies:**

$$E_{ij} = \frac{R_i \times C_j}{N}$$

Where

- $E$  = expected count
- $R_i$  = row total for row  $i$
- $C_j$  = column total for column  $j$
- $N$  = grand total (250 respondents)

$$E_{11} = 41.16, \quad E_{12} = 7.84$$

$$E_{21} = 168.84, \quad E_{22} = 32.16$$

**Chi-square statistic:**

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 0.0218$$

Where

- $\chi^2$  = Chi-square test statistic
- $O_{ij}$  = observed frequency in row  $i$ , column  $j$
- $E_{ij}$  = expected frequency in row  $i$ , column  $j$
- $r$  = number of rows
- $c$  = number of columns

**4 Results and Discussion**

**Sample profile**

Age. Mean = 27.996 years, SD = 8.030, min = 17, max = 48 (N = 250).

Formula for Standard Deviation:

$$\bar{Y} = \frac{1}{n} \sum_{i=1}^n Y_i$$

$$s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (Y_i - \bar{Y})^2}$$

•  $\bar{Y}$  = sample mean (average value)

$n$  = total number of respondents (sample size)  
 $Y_i$  = value of the variable for respondent  $i$  (e.g., individual age)  
 $s$  = standard deviation (measure of spread around the mean)

The data shows that the “average” respondent is about 28 years old. The standard deviation of 8 years indicates that there is a moderate spread of ages around this mean, with most respondents falling between 20 and 36 years. This variation is

Degrees of freedom:

$$df = (r - 1)(c - 1) = 1$$

$$p \text{ value} = 0.883$$

Since  $p > 0.05$ , the test shows no statistically significant association between being aware that fake news circulates and being aware of fact-checking methods. In other words, while most respondents recognize the existence of fake news, this does not translate into knowledge of fact-checking practices. Although most respondents recognize that fake news circulates, this awareness does not translate into awareness of fact-checking methods. This disconnect (non-significant  $\chi^2$ ) is consistent with Brennen et al. (2020)<sup>9</sup> and Indian rural evidence (Narayan et al., 2022): people know about fake news but do not know (or use) verification practices.<sup>16</sup>

### Policy framework awareness & accountability

- **Accountability:** Individual users = 134 (53.6%), Platforms = 103 (41.2%), Other = 13 (5.2%).
- **Basis of truthfulness:** “Shared by many” = 163 (65.2%), “Well-wisher” = 67 (26.8%), “In tune with thoughts” = 7 (2.8%).
- **When doubted:** Cropped photo = 65 (26.0%), Edited video = 57 (22.8%), Photoshopped image = 41 (16.4%), Altered audio = 16 (6.4%).
- **Suggested measures:** Media centers = 59 (23.6%), Media literacy curriculum = 64 (25.6%), Punishment = 35 (14.0%), Accountability = 47 (18.8%), Govt. rules = 17 (6.8%).

Judgments of truth rely heavily on popularity (“shared by many”) and interpersonal trust (“well-wisher”), rather than verification—mechanisms long known to amplify rumor diffusion. Respondents’ preferred solutions—education and community information centers—closely track UNESCO’s MIL guidance (UNESCO, 2011)<sup>5</sup>. Relative to urban findings (Singh & Bhatnagar, 2021)<sup>17</sup> policy-tool awareness (e.g., PIB Fact Check) appears lower here.

### Media Literacy Index (MLI)

We computed MLI per respondent as:

$$MLI_i = \frac{F_i + C_i + D_i}{3}, \quad MLI_i \in [0,1]$$

Where

- $F_i = 1$  if aware fake news circulates, else 0
- $C_i = 1$  if aware of fact-checking, else 0
- $D_i = 1$  if faced consequences of fake news, else 0

Group mean MLI:

$$\overline{MLI}_g = \frac{1}{n_g} \sum_{i \in g} MLI_i$$

### Results

- Overall mean MLI = 0.479 (N = 250)
- Female = 0.471 (n = 128), Male = 0.486 (n = 122)
- Education (top): High School = 0.667; Post-Graduate = 0.667; Diploma = 0.500; Intermediate = 0.483; Graduate = 0.457; B.Tech = 0.333; PhD = 0.333; Other = 0.000

Average MLI < 0.5 indicates limited critical literacy despite high platform use—a form of skill divide (Van Dijk, 2005). Small gender differences suggest the constraint is structural (exposure, training) rather than demographic. Plotting age against MLI reveals a general negative association between MLI and average age. However, the observation for MLI = 1 deviates from this trend, likely due to the small subgroup size (n = 17) relative to the total sample (N = 250).

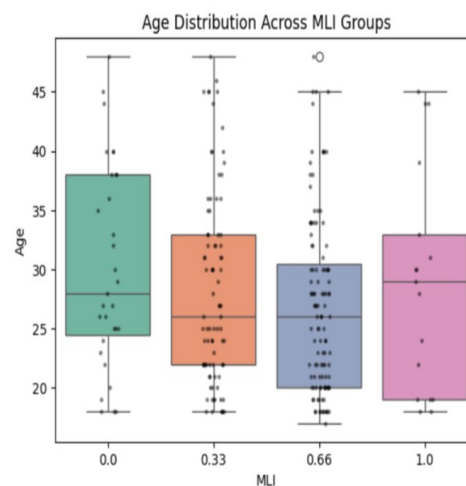


Figure 1: Relationship between age and MLI.

**Conclusion:-**The study of 250 respondents across 25 villages in Narendranagar Tehsil, Uttarakhand, reveals important insights into the intersection of rural internet use, misinformation exposure, and media literacy.

**1.Social Media Usage is Universal but Shallow.** =All respondents reported using social media, with WhatsApp adoption at 100%. The majority spend 1–2 hours daily online, indicating deep penetration of digital platforms even in rural areas. However, this usage is largely consumptive rather than critical, guided by algorithmic feeds.

**2.Active Forwarding, Passive Creation.**

While 71.6% of respondents qualify as “active” by sharing or forwarding posts, original content creation remains very low. This forwarding-heavy pattern is significant because it accelerates the spread of misinformation while requiring little critical engagement.

**3.Awareness–Practice Gap.**

A large majority (80.4%) are aware that fake news circulates, yet only 16% are aware of fact-checking methods, and even fewer (10%) can name a fact-checking site. The Chi-square test confirmed that awareness of fake news is not associated with awareness of fact-checking ( $\chi^2 = 0.0218$ ,  $df = 1$ ,  $p = 0.883$ ). This demonstrates a clear gap: recognition of misinformation does not translate into literacy for verification.

**4.Reliance on Social Heuristics.**

When judging truthfulness, respondents rely primarily on popularity (“shared by many”) and inter- personal

trust (“well-wisher”) rather than evidence or verification. Similarly, doubts about content arise mainly when visual manipulation is obvious (cropped images, edited videos). This indicates vulnerability to more subtle forms of misinformation.

**5. Policy Awareness and Preferences.**—A majority assign accountability to individual users (53.6%) and platforms (41.2%), but knowledge of formal policy tools (e.g., PIB Fact Check, IT Rules 2021) is very limited. Respondents emphasized the need for media literacy in school curricula and local media information centers, reflecting grassroots demand for structured interventions.

**6. Media Literacy Index (MLI) is Low.**—The overall MLI is 0.479, showing that media literacy skills remain underdeveloped despite widespread access. Scores were similar for males (0.486) and females (0.471), suggesting the constraint is structural, not gender-based.

The findings highlight a second-level digital divide in rural Uttarakhand: access to the internet is no longer the problem, but critical skills for evaluating and verifying information remain weak. While rural users are aware of misinformation and highly active in forwarding content, they lack the tools and literacy to effectively fact-check or resist falsehoods.

This disconnect makes rural communities particularly vulnerable to political misinformation, health-related rumors, and digitally manipulated content. Addressing this gap requires:

- Embedding media literacy in formal education at multiple levels.
- Creating local media information centers for accessible fact-checking support.
- Designing culturally contextualized awareness campaigns that move beyond “awareness of fake news” to practical verification skills.

By strengthening rural media literacy, misinformation can be mitigated not just through platform regulation, but through empowered citizens who are better equipped to consume, assess, and share digital content responsibly.

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