Socio-demographic Predictors for Misinformation Sharing and Authenticating amidst the COVID-19 Pandemic among Malaysian Young Adults

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Abstract

This study investigates the socio-demographic predictors for misinformation sharing and authenticating behavior among Malaysian young adults, based on data collected during the COVID-19 pandemic through a self-reporting survey. A total of 833 Malaysians aged between 18 and 35 years old were recruited. Results indicate that 64.5% (n = 537) of the respondents authenticated suspicious news, 16% (n = 133) shared misinformation knowingly, while 30% (n = 250) did so unknowingly. Frequency of sharing news ($\beta = 0.229$, $p < 0.001$), frequency of social media use ($\beta = 0.135$, $p = 0.03$), frequency of access to online news portals ($\beta = -0.141$, $p = 0.007$) and the ability to identify misinformation ($\beta = -0.161$, $p < 0.001$) significantly predicted misinformation sharing. Conversely, only frequency of sharing news ($\beta = -0.425$; $p < 0.001$) and importance of reading real news ($\beta = 0.873$; $p < 0.001$) predicted authentication behavior. Findings suggest that the majority of the misinformation sharing behavior is accidental instead of intentional, and proposes several strategies that can be adopted to mitigate the wide spread of misinformation including seminars and trainings to improve an individual's social media literacy, critical thinking and analytical skill and also one's social responsibility as a good citizen.

Introduction

The term misinformation has been used widely after the US Presidential election in 2016 whereby a Facebook flaw allowed the widespread dissemination of misinformation believed to have affected people's choice of the vote, and thus had a tremendous impact on the result of the election (Allcott and Gentzkow, 2017; Bakir and McStay, 2018). Misinformation (or widely used interchangeably as fake news) refers to any claims or depictions that are inaccurate, often to mislead people (Wardle and Derakhshan, 2017). The spread of misinformation has become a major burden worldwide due to its damaging effects, particularly on social media such as Facebook and Twitter, that has become a fertile ground for the dissemination of unverified content among its users (Klein and Wueller, 2017).

The phenomenon is more worrisome when it is related to public health and pandemic such as COVID-19. As a matter of fact, the proliferation of misinformation has intensified significantly during the COVID-19 pandemic worldwide (Pennycook et al., 2020; Pulido et al., 2020), and thus potentially jeopardized the safety of the general population.

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This suggests that individuals could be falsely lured into taking some false precautionary measures leading to severe health damage. For instance, many people were found to have believed that the consumption of salty water and bleach, soaking up the sun and taking hot baths cures one from the COVID-19 virus (World Health Organization (WHO), 2020). It is, therefore, unsurprising that misinformation spread about COVID-19 is happening faster than the efforts to contain it.

Malaysia is not exempted from this harmful behavior. The local online media content regulator, Malaysian Communications and Multimedia Commission (MCMC) revealed that 14% of misinformation received in 2020 was related to the pandemic (MCMC, 2020). The government took several initiatives to curb the mounting misinformation including public campaigns emphasizing on the importance of verifying news, and periodical text message reminders on the dangers of misinformation sharing. In fact, the government has recently published a fake news ordinance that sets a jail term up to three years or a fine up to MYR100,000 (USD 23, 800), or both for creating, publishing, or disseminating any "wholly or partly relating to Covid-19 or the proclamation of emergency" to counter the rapid increase of misinformation sharing in the country (Gangadaran, 2021).

The existing literature has shown that researchers attempting to investigate, understand and tackle this issue from numerous angles. For instance, some authors examined the prevalence of misinformation spread such as Allcott and Gentzkow (2017) in the US and Watanabe (2017) in Russia, whereas others attempted to understand the reasoning behind this harmful behavior through the identification of possible motives such as social media fatigue, fear of missing out, entertainment, altruism, trust and pass time, among others (Apuke and Omar, 2021; Cheng and Chen, 2020; Islam et al., 2020; Laato et al., 2020; Talwar et al., 2019). Another stream of research that seems to be exceedingly popular revolves around early detection mechanisms using artificial intelligence and natural language processing techniques (Huang and Chen, 2020; Reis et al., 2019; Silva et al., 2020) or those examining social media feed based on the writing style, and linguistic features, among others (Jang et al., 2018; Shin and Thorson, 2017). On the other hand, authors such as Talwar et al. (2019) examined the motives behind authenticating news before sharing, with online trust having a significant effect.

Although misinformation dissemination is a worldwide problem, most of these studies have been conducted in the Global North, for example US (Allcott and Gentzkow, 2017; Bakir and McStay, 2018; Silverman and Singer-Vine, 2016), Russia (Watanabe, 2017) and Spain (Herrero-Diz et al., 2019; Resende et al., 2019) among others, with very few focusing on the Asian regions including Singapore (Chen et al., 2015) and Indonesia (Wibowo et al., 2019). Studies on misinformation during the COVID-19 pandemic have increased with scholars examining this issue in Bangladesh (Islam et al., 2020; Laato et al., 2020), Nigeria (Apuke and Omar, 2021) and India (Datta et al., 2020), among others. To the best of our knowledge, no research-based studies examining this phenomenon has been conducted in Malaysia except for periodicals and articles that are commentary of nature (Daud and Zulhuda, 2020; Yatid, 2020). Further, news and statistics indicate the proliferation of misinformation in the country especially during the pandemic (MCMC, 2020), hence research is warranted to examine the prevalence rate and the socio-demographic predictors of the individuals involved in this behavior so that a clearer insight is obtained.

Additionally, mixed findings with regards to the cohorts involved in misinformation dissemination have been found whereby some scholars reported more youths to be duped or purposely engage in misinformation sharing (Chen et al., 2015; Herrero-Diz et al., 2019; Wineburg and McGrew, 2016) whereas others found older participants to do so more (Grinberg et al., 2019; Guess et al., 2019). Nevertheless, considering the popularity of social media among the younger users (i.e. Gen Y and Z), and the tendency for them to rely on these platforms for news (Apuke and Omar, 2021; Gottfried and Barthel, 2015; Hasnan, 2019), a further investigation targeting the young adults is deemed justified.

To the best of our knowledge, this study is the first to examine the prevalence rates of misinformation authentication and sharing during the COVID-19 pandemic - a crucial period in which a significant spike in the dissemination of misinformation was observed worldwide (and in Malaysia). To fill this gap, we formulate our first research question (RQ) as follows:

RQ1: What are the prevalence rates of misinformation sharing and authenticating among Malaysian young adults?

Further, the study also aims to identify: *Socio-demographic Predictors for Misinformation Sharing and*

Authenticating amidst the COVID-19 the socio-demographic predictors for misinformation sharing and authenticating behaviors. The study is guided by the following hypothesis and RQs:

Hypothesis – *Socio-demographic predictors have significant roles in misinformation sharing and authenticating behaviors.*

RQ2a: What is the socio-demographic predictor(s) for misinformation sharing?

RQ2b: Which socio-demographic predictors are significantly different in affecting misinformation sharing?

RQ3a: What is the socio-demographic predictor(s) misinformation authentication?

RQ3b: Which socio-demographic predictors are significantly different in affecting misinformation authentication?

Background

Misinformation

Literature revealed various concepts regarding misinformation. Some scholars refer to it as a piece of information lacking veracity but intends to mislead people, often delineating between intentional and unintentional falsification (Wardle and Derakhshan, 2017). As it is difficult to assess or determine the true intention of information spread, other scholars refer to misinformation as fabricated information that is predominantly unintentional and honest mistake (Allcott and Gentzkow, 2017), often using terms such as hoax, rumor, and disinformation interchangeably. Finally, misinformation is also deemed to be true or informative depending on its context (e.g. headlines that are not entirely false but aimed to mislead people) (Ecker et al., 2014). In light of these concepts, we define misinformation as "misleading or incorrect information in any forms, disseminated intentionally or unintentionally. Therefore, they can be in the form of texts, images, videos, and links among others."

Misinformation and socio-demographic profiles

Work on the prevalence of misinformation sharing and those investigating user demographics are scant, except for a few. One of the earliest studies found in the literature was by Chen et al. (2015) who investigated misinformation sharing behavior among 171 undergraduate and graduate students in Singapore, with results indicating over 60% of their respondents to have shared misinformation, citing reasons such as socializing and self-expression. A further analysis revealed females to have significantly shared more misinformation on social media and had higher intention to share misinformation than males. Additionally, they also found undergraduates share and intend to share more misinformation than the post-graduates, albeit with no significant difference.

In Indonesia, Wibowo et al. (2019) surveyed 480 adults and found around 30% of their respondents have a high tendency to share misinformation, and this is often done by individuals who spend more time online (measured based on high Internet spending). The authors however, found age, gender and education levels do not affect misinformation sharing behavior. In terms of the ability to identify false news, their findings show at least 68.5% of the respondents can identify misinformation, and the remaining 31.5% couldn't do so.

Other misinformation studies were predominantly conducted in the US. According to the Pew Research Center (2016), approximately 23% of Americans had knowingly or unknowingly shared a false content. Some scholars have attempted to examine user behaviors in terms of their ability to differentiate between fake and real news, for example, Silverman and Singer-Vine (2016) found 75% of the US adult respondents correctly identified false headlines related to the 2016 election. A similar study focusing on the 2016 election found adults who consume more time on social media, older and with higher education to have more accurate beliefs about news whilst those who rely on social media as the main source of news tend to incorrectly believe false headlines (Allcott and Gentzkow, 2017).

Others such as Wineburg and McGrew (2016) and Herrero-Diz et al. (2019) found college students to be easily tricked/duped in believing information found on social media, something to be concerned about considering most of them tend to spend a lot of time on social media platforms. Recent surveys support this notion, for example, Smith and Anderson (2018) found 88% of their survey respondents (between 18 and 29 years old) to actively use social media whereas another survey among 6000 college students in the US revealed 89% of the respondents obtain their news from social media platforms (Head et al., 2018). Interestingly, millennials (between 18 and 34 years old) tend to rely more on Facebook (for political

news) than any other source (Gottfried and Barthel, 2015). As a matter of fact, according to the Ipsos Survey 2019, approximately 71% of Malaysians below the age of 25 also depend on social media for news (Hasnan, 2019).

In the context of Internet and social media (problematic) use, studies have often reported frequency of use to affect users' online (negative) behavior. For instance, a higher Internet frequency use has been linked to more cyberbullying perpetration and victimization (Balakrishnan, 2015), indicating that as the time spent on Internet increases, so does the chances to be bullied and to bully someone. In fact, social media consumption has been reported to have increased during the COVID-19 pandemic as more people access the platform to seek information related to the virus and disease, hence increasing the likelihood to be exposed to false news and thus, the spread of misinformation as well (Pennycook et al., 2020; Pulido et al., 2020). For instance, Pennycook and colleagues found more misinformation related to COVID-19 preventive cures and tips to be circulating online since the outbreak in January 2020 (Pennycook et al., 2020). Therefore, there is a high tendency for individuals who spent more time on social media to engage more in misinformation sharing behavior.

Finally, to the best of our knowledge, no studies on misinformation authentication and socio-demographic predictors was found. In fact, only Talwar et al. (2019) examined authentication behavior, however, the authors focused on the underlying motives instead. Considering these findings and gaps, it would be interesting to determine the prevalence of misinformation sharing and authenticating behaviors, especially during an on-going COVID-19 outbreak among a cohort that is deemed to be digitally savvy. Further, the identification of their socio-demographic predictors will also aid in providing useful insights into this harmful behavior which can cause deleterious effects.

Method

The study is part of a larger study that investigates the underlying motives of misinformation sharing among Malaysians (n = 869) during the COVID-19 pandemic using the SocioCultural-Psychological-Technology (SCulPT) model, Uses and Gratification (U&G) theory and Self-Determination Theory (SDT) (Balakrishnan et al., 2021). SCulPT was originally developed to determine cyberbullying predictors (Balakrishnan, 2017), and the model was adapted to include

Technology, Entertainment and Ignorance as fake news sharing motives. On the other hand, the U&G theory is popularly used to examine media gratifications, comprising four factors: social (social influences and social ties), process, content and technology gratifications (Katz et al., 1973). Both Entertainment and Pass Time were adopted from U&G. Finally, SDT hypothesizes that individuals have innate psychological needs (i.e. relatedness or sense of belonging) (Ryan & Deci, 2000). The theory has been used to help explain the manifestation of Fear of Missing Out (FoMO) that is fueled by the need for relatedness and sense of belonging. The authors found motives such as Altruism, Ignorance, and Entertainment to significantly predict misinformation sharing behaviour whereas Availability/Effort (i.e. Technology), Pass Time and FoMO to be insignificant (Balakrishnan et al. 2021). This section therefore, only focuses on sections related to this work. We use the term misinformation and fake news interchangeably to align with the term used in the questionnaire.

Materials and measures

A self-reporting questionnaire survey was developed in English based on a fake news sharing model comprising six independent variables - namely, Technology, Attitude, Altruism, Entertainment, Pass Time and Fear of Missing Out - and one dependent variable - Fake news sharing. The questionnaire had three main parts - Part A had ten questions soliciting the respondents' profiles including age, gender, status, frequency of using online news portals, mobile phones and social media in a day, and frequency of sharing news (fake or real), among others. Basic questions such as if the respondents know the definition of fake news, and if they can differentiate between fake and real news were also included in Part A.

Part B: The definition for misinformation is provided, followed by an instruction to answer the questions based on the respondents' personal experiences since January 2020. Five items in this part measure if the respondents have shared misinformation before (knowingly and unknowingly) and the medium(s) used (social media, chat, mobile messaging services). The term "unknowingly" in this study refers to the uncertainty whether individuals have shared fake news or not whereas 'knowingly' refers to individuals doing the same despite being fully aware that it is fake news. The items were measured on a four-point scale (1 – Strongly disagree; 4 - Strongly agree). Two

of the items ("I have shared misinformation before knowingly" and "I have shared misinformation before unknowingly") were later re-coded to determine the misinformation sharing prevalence rate. In other words, all the responses marked "agree" and "strongly agree" were grouped as Yes, and vice-versa. Finally, Part C contains all the items measuring the underlying motives of misinformation sharing (i.e. Technology, Attitude, Altruism, Entertainment, Pass Time and Fear of Missing Out). These are excluded from our analysis in this paper. The complete questionnaire is provided in Appendix A.

Procedure

Convenience sampling approach was adopted in which study respondents were sought through the online medium, particularly Facebook and WhatsApp. Forty-two undergraduate students from Universiti Malaya registered for the Probability and Statistics course assisted with the data collection by disseminating the Google Form link through social media platforms. The data collection was done as part of their project tasks, hence they earned credit points for their efforts.

Respondents

Malaysians aged above 18 years old were sought resulting in 869 valid responses (18 and 59 years old). However, as the present study focused on young adults, respondents aged 36 and above were excluded, resulting in a final sample of 833 young adults (Mean = 21.6; Standard deviation = 3.23). We defined young adults as those between 18 and 35 years old, as per Petry (2002).

Statistical analysis

The Statistical Package for Social Sciences (SPSS) Version 26 was utilized to describe the data using mean, standard deviations (sd), and frequency. Both skewness and kurtosis were within ± 1, hence the data are deemed to be normally distributed. To identify the significant predictors for misinformation sharing (scale) and authentication (binary), linear and logistic regressions were used, respectively. The misinformation sharing variables (i.e. knowingly, and unknowingly) used in the study was measured based on a Likert scale (Part B) whereas the authenticating behavior was re-coded into a binary variable (Yes, No) based on the

responses provided in Part A. To be precise, responses provided for "What actions do you take when you receive a suspicious news?" was re-coded into a variable named Authenticate: Ignore and share/forward immediately (No) and the remaining actions were labelled as Yes. Analysis of Variance (ANOVA) was administered to examine for any statistically significant differences between the identified predictors. Significancy was set at $p < 0.05$, unless otherwise stated.

Results

Socio-demographic profiles of the young adults

As depicted in Table 1, females outnumbered the males (505; 60.6% versus 328; 39.4%), and as expected most of the respondents were tertiary students (698; 83.8%) followed by those who were working (123; 14.8%). The sample can be considered as active considering the amount of time spent on social media (403; 48.4% more than 5 h daily) and mobile phones (595; 79.4% more than 5 h daily). Nearly half of the respondents (361; 43.3%) spent 1 to 5 h daily checking online news portal, followed very closely by those who spent less than an hour doing so (360; 43.2%). Only 13% spent more than 5 h on online news portals daily.

Social media emerged as the main source of information for this cohort (612; 73.5%), in accordance with previous studies and surveys that found a huge majority of students obtain news from the social media (Hasnan, 2019; Head et al., 2018; Smith and Anderson, 2018). As a matter of fact, some scholars refer to social media platforms as "the lifeblood of fake news" as the medium allows the spread of false news to a large audience efficiently, effectively and at a low cost (Klein and Wueller, 2017). More respondents (168; 20.2%) accessed online news portals compared to traditional mediums – a pattern that was somewhat expected considering the respondents being younger, hence more digitally savvy. In fact, a similar pattern was reported whereby only 23% of young Malaysians (below 25) referred to traditional printed materials for news as opposed to 71% who preferred social media (Hasnan, 2019).

Most of the young adults in our sample have shared news (735; 88.2%) compared to those who never do so (98; 11.8%), regardless of whether the news is real or fake. Further, most of them (741; 89%) also claimed to know what misinformation or fake news is, followed by those who seemed to be unsure (86; 10.3%). Although a majority of them (741; 89%) claimed that reading real news matters, the remaining

Table I. Socio-demographic profile of the respondents (n = 833).

Demographic variables	Categories	n	%
Gender	Male	328	39.4
	Female	505	60.6
Status	Working	123	14.8
	Students	698	83.8
	Others	12	1.4
Daily access to online news portals (Hours)	<1	360	43.2
	1–5	361	43.3
	>5	112	13.4
Daily access to social media (Hours)	<1	53	6.4
	1–5	377	45.3
	> 5	403	48.4
Daily use of mobile phone (Hours)	<1	19	2.3
	1–5	219	26.3
	> 5	595	79.4
Main source of information	Social media	612	73.5
	Digital news	168	20.2
	Traditional (printed)	7	0.8
	Traditional (Radio, TV)	15	1.8
	Family/friends	31	31.7
Frequency of sharing news (fake or real)	Never	98	11.8
	Seldom	464	55.7
	Occasionally	196	23.5
	Frequently	75	9.00
Definition of fake news/misinformation?	Yes	741	89.0
	No	6	0.7
	Unsure	86	10.3
Authenticity Importance?	Yes	740	88.8
	No	37	4.4
	Don't care	56	6.7
Can identify false news while reading?	Yes	324	38.9
	No	98	11.8
	Unsure	411	49.3
Action taken on suspicious news	Ignore	272	32.7
	Share/Forward immediately	16	1.9
	Fact-checking website	237	28.5
	Google verification	202	24.2
	Family/friends verification	106	12.7
Aware of fact-checking website in Malaysia?	Yes	345	41.4
	No	488	58.6

11% (n = 92) think otherwise or simply do not care. Unfortunately, close to half the sample (411; 49%) are unsure of their ability to differentiate between fake and real news, followed by those who think they can (324; 38.9%), a sentiment that has been reflected in other studies considering misinformation tend to "look and feel" like real news - a strategy employed to increase the credibility and legitimacy of the said news (Tandoc et al., 2018).

Finally, although more than half the sample (488; 58.6%) were not aware of the existence of the local fact-checking website, the majority (560; 65.3%)

claimed to perform some form of authentication/verification when they receive news of a suspicious nature, particularly through fact-checking websites (237; 28.5%) and Google (202; 24.2%), the former suggesting that the respondents may be aware of other available sites (e.g. Snopes.com).

Misinformation authentication and sharing prevalence rates

Table 2 provides the answers to our RQ1, which is to determine the prevalence rates of misinformation

authentication and sharing behaviors among the respondents. It is to note that the authentication variable was dichotomized as described in Methodology, and the results on medium used to share misinformation are provided in addition. Looking at Table 2, it can be observed that most of the young adults (545; 65.4%) in this study claimed to authenticate suspicious news compared to those who don't (288; 34.6%).

Approximately, 16% (n = 129) and 30% (n = 244) have shared misinformation knowingly and/or unknowingly, respectively. Chat applications such as Instant Messengers, Facebook Messengers, and Skype, among others emerged as the most widely used tool for misinformation sharing among the respondents (82.7%), followed by mobile messaging services (WhatsApp, Short Message Services) (24.6%).

Misinformation sharing predictors

Linear regressions with nine independent variables (see Table 3) and misinformation sharing as the

dependent variables were administered to answer RQ2a – what are the significant predictors for misinformation sharing, followed by ANOVA to answer RQ2b.

Results indicate frequency of social media use (β = 0.135, p = 0.03) and frequency of sharing news (β = 0.229, p < 0.001) to significantly predict sharing misinformation knowingly, with positive coefficients, hence indicating that the higher the consumption of social media and the higher the tendency to share news, the higher the tendency to share misinformation. Frequency of sharing news willingly was also found to significantly predict misinformation sharing, with notable differences as per the ANOVA results. Specifically, positive differences were observed between Never and the rest of the categories (Seldom, Occasionally and Frequently) (p < 0.001), clearly showing that when one tends to share any piece of news; there is always a higher risk of disseminating misinformation. No significant differences were observed for frequency of mobile phone use and misinformation sharing behavior though.

On the other hand, frequency of accessing online news portals (β = - 0.141, p = 0.007) was found to be a significant predictor with a negative coefficient, therefore, the more people access online news portals the lesser the tendency to share misinformation. Finally, both the perception of one's ability to identify misinformation (β = -0.161, p < 0.001) and the importance of reading genuine news (β = -0.131, p = 0.039) predict misinformation sharing behavior significantly and negatively.

Misinformation authentication predictors

A logistic regression analysis was performed using Authenticate as the dependent variable in order to

Table 2. Prevalence rates of sharing and authenticating misinformation and medium used.

Variables	Categories	n	%
Authentication behaviour	Yes	545	65.4
Shared misinformation knowingly	Yes	129	15.5
Shared misinformation unknowingly	Yes	244	29.8
Medium used to share	Chat (IM, FB Messengers, Skype)	689	82.7
	Social media (FB, Twitter)	106	12.8
	Mobile messaging (SMS, WhatsApp)	205	24.6

Table 3. Predictors for sharing misinformation and ANOVA.

Socio-demographic	β	t	p	ANOVA F (p-value)
Gender	0.059	0.842	0.400	-
Age	0.060	−0.762	0.446	-
Status	−0.128	−1.957	0.053	-
Frequency of social media use	0.135	2.085	0.031*	2.37 (0.094)
Frequency of accessing online news portals	−0.141	−3.069	0.007*	3.65* (0.026)
Frequency of sharing news	0.229	5.393	< 0.001*	16.10* (< 0.001)
Frequency of mobile phone use	−0.880	−1.160	0.246	-
Can identify misinformation	−0.161	4.468	< 0.001*	21.19* (< 0.001)
Authenticity importance	−0.131	2.070	0.039*	3.01 (0.055)

*Significant at p < 0.05; Model significant (F (9, 832) = 7.749; p < 0.001).

Table 4. Misinformation authentication predictors and ANOVA.

Socio-demographic	β	Wald	p - value	ANOVA F (p-value)
Gender	−0.033	0.042	0.838	-
Age	−0.129	0.178	0.470	-
Status	0.246	1.359	0.244	-
Frequency of social media use	0.257	3.019	0.080	-
Frequency of accessing online news portals	0.155	1.860	0.172	-
Frequency of sharing news	−0.425	18.200	< 0.001*	7.947 (< 0.001*)
Frequency of mobile phone use	0.035	0.040	0.841	-
Can identify misinformation	−0.066	0.649	0.420	-
Authenticity importance	0.873	36.370	< 0.001*	22.47 (< 0.001*)

Model significant: Chi-square = 73.8, p < 0.001.

identify the significant predictors in order to answer RQ3a, followed by ANOVA to answer RQ3b.

As shown in Table 4, two significant predictors were found for misinformation authentication, that is, frequency of sharing news and the importance of reading real/authentic news. Frequency of sharing news (β = -0.425; p < 0.001) has a negative β coefficient, hence indicating that individuals who tend to share news less likely authenticate news. In fact, this finding is further supported by the ANOVA results whereby those who Never share any news significantly show a higher tendency to authenticate news compared to those who do (p < 0.001).

On the other hand, individuals who emphasize on the importance of reading authentic news were found to significantly authenticate information as shown by the positive β coefficients. ANOVA revealed significant differences for this socio-demographic variable as well whereby significant differences were observed between those who emphasize on authenticity importance and those who don't (p = 0.022) and don't care (p < 0.001).

Discussion

The present study examined the misinformation sharing and authenticating prevalence and identified the socio-demographic predictors among Malaysian young adults (n = 833), examined during the COVID-19 pandemic. Socio-demographic profiles of the respondents show that the majority are active social media users, with a high tendency to use the platforms as the main source of information. Findings also show that the respondents actively share information online, with 16% (n = 129) and 30% (n = 244) having shared misinformation knowingly and/or unknowingly, respectively. This is in accordance with many studies that have reported the tendency for individuals to share news without prior authentication (Chen et al., 2015; Pennycook et al., 2020; Talwar et al., 2019), something deemed worrying especially in time of a pandemic whereby it is pertinent to ensure that people are consuming facts instead of false information that can be damaging, and even potentially result in a public unrest We, therefore, concur with Chen et al. (2015) that young adults (and educated) contribute to the spread of misinformation regardless of if it's done intentionally or unintentionally, and further emphasize on the importance of authenticating dubious news before any form of dissemination among their contacts/network.

Interestingly, although social media emerged as the main source of information among the respondents in this study, the platform however, was not popularly used to share misinformation (106; 12.8%) unlike findings in other studies (Rampersad et al., 2019). Instead, chat applications (e.g. Instant Messengers, Facebook Messengers, and Skype) emerged as the most widely used tool for misinformation sharing among the respondents, followed by mobile messaging services (WhatsApp, Short Message Services). This suggests that although the majority of the young adults rely on social media for COVID-19 related news, they are probably sharing or forwarding the links through other mediums. For instance, a (fake) news found on their Facebook feed are probably shared through its messenger application, further implying that the news is disseminated among specific contacts and not to all "friends". This sentiment is corroborated by others who found users' tendencies to form and belong in several groups consisting of friends, families and like-minded people, in which messages containing (mis) information are forwarded extensively (Resende et al., 2019; Herrero-Diz et al., 2019). Alternatively, although social media has been cited as the main tool for the

spread of misinformation, studies failed to mention how this was specifically measured (Rampersad et al., 2019). For example, although WhatsApp currently belongs to Facebook, it is still considered a mobile/instant messaging app instead of social media. The present study delineated between chats, messaging services and social media, hence the findings are deemed to be more specific.

Our findings also revealed frequency of social media use and frequency of sharing news significantly and positively predicted misinformation sharing. This is in line with Wibowo et al. (2019), however, in contrast with Allcott and Gentzkow (2017) who found educated older adults who spent more time on social media have a better accurate belief in news, suggesting the younger and older generations consume social media in a completely different manner, and educated older users perhaps are wiser and more matured in dealing with false information.

A significant negative effect was observed for frequency of accessing online news portals and misinformation sharing, hence indicating the more people access online news portals the lesser the tendency to share misinformation. This implies that individuals who take the time to read articles in its entirety instead of glancing at the news headlines are better in discerning the authenticity of the information provided to them. This is further substantiated by the ANOVA results whereby respondents who spent less than an hour accessing digital news daily were found to significantly engage in misinformation sharing behavior than those who spent more than 5 h daily (p = 0.034). This suggests that young adults who do not take more time in exploring and reading news from the original or official sources are not well-versed with the news/information; hence they have a higher tendency to share unverified content. This is especially true considering this is generally a young cohort who tends to trust others within their close-networks or tends to follow influencers, and thus, is less likely to ensure the veracity of information before dissemination (Cheng and Chen, 2020; Herrero-Diz et al., 2019). The finding suggests the awareness on the importance of verifying media content need to be cultivated among these young adults.

An individual's perception of his/her ability to identify misinformation and the importance of reading genuine news were found to predict misinformation sharing behavior significantly and negatively. This is somewhat expected as it shows that individuals who can differentiate between fake and real news are

probably more cautious in forwarding information that are dubious, as with those who emphasize on the importance of reading real news. However, significant differences were only noted for the perception of one's ability to identify misinformation, between those who can and those who can't (p < 0.001) or unsure (p < .0.001). The negative mean differences indicate those who can differentiate less likely engage in misinformation sharing compared to those who can't or unsure. This suggests many of the respondents who claimed to be able to identify misinformation to be responsible individuals as they are more cautious in dealing with misinformation. Interestingly, individuals who do not know how to identify misinformation significantly engage in lesser false news sharing than those who are unsure, suggesting the latter tend to disseminate news even if they are suspicious of the content. This is a cause for concern as it is the responsibility of each individual to verify the authenticity of any piece of information (and especially those dubious in nature) prior to consumption and dissemination, and therefore young adults who continue to spread the unverified information is engaging in a risky behavior.

In terms of authentication, frequency of sharing news and the importance of reading real/authentic news significantly predicted the said behavior among the respondents. The finding tallies with our results whereby 30% (244) of the respondents were found to have shared misinformation unknowingly, suggesting that they did not take the initiative to verify information prior to dissemination – a pattern that has been echoed in other studies such as Pennycook et al. (2020) and Chen et al. (2015). We, therefore, emphasize on the need for an improved media literacy among the young adults so that they are able to better understand and process online content to counter the wild spread of false content, which can have detrimental effects.

Conclusion

Misinformation refers to fabricated news created and spread to deceive people, with potentially damaging effects. The present study aimed to investigate the socio-demographic predictors for misinformation sharing and authenticating among Malaysian youth aged between 18 and 35 years old. Salient findings show that approximately 65% (n = 541) of our young adults are in the habit of authenticating news, and 46% (n = 383) have shared misinformation

(knowingly and unknowingly). Individuals who spent more time on social media, and share any form of news more have a higher tendency to share misinformation whilst those who spent more time accessing online news portals were found to less likely to engage in misinformation sharing. Conversely, frequency of sharing news and the importance of reading genuine real news predicted the respondent's authentication behavior.

Implication

Our findings imply that misinformation dissemination is more accidental than intentional, as the majority of the young adults in our study have a tendency to share misinformation unknowingly as they failed to verify the information given. The study calls for programs and seminars that aim at improving the analytical and critical thinking skill of the young adults so that they are not gullible to accept anything at face value. This is particularly true among the Gen Y and Z who make up the largest consumers of social media, and thus are exposed to all types of media content.

We also emphasize on the importance of educating not only the young population but the general public on the importance of verifying information prior to dissemination. Although our sample was mostly made up of educated individuals, many were not aware of the local fact-checking website (sebenarnya.my) even though it has been in place since 2017. Therefore, the local government should look into promoting the website especially now considering the on-going COVID-19 pandemic to ensure that the general public is only consuming authentic news. We also echo the sentiments of fellow researchers who call for proper training considering the lack of formal or informal education process in the use of new media is affecting one's perception, and that "knowledge and education are the best weapons against fake news" (McDougall et al., 2018; Valero and Oliveira, 2018 as cited in Herrero-Diz et al., 2019)

Further, although social media did not emerge as the most popular tool used to spread misinformation in this study, it nevertheless proved to be the prime source of information for the young adults. In fact, social media is literally loaded with information with various contents that are deemed attractive and intriguing, hence determining the credibility and veracity of the said information becomes a difficult task.

Therefore, it is pertinent to improve one's social media literacy as a lack of knowledge and understanding of the mechanics behind new media content creation may contribute to the rapid spread of misinformation. We call for this effort in improving social media literacy to be introduced not only in schools and tertiary institutions, but to target the older generations as well. Finally, technology-based interventions can also be adopted to counter misinformation sharing as per Pennycook et al. (2020) who found simple accuracy reminders (or nudging) improve choices about what to share on social media.

Limitations and future directions

The study has a few limitations – first, self-reporting questionnaire surveys are useful in providing the quantitative aspect of the study, and they are also fast and convenient to be administered. However, the approach may result in issues such as social desirability bias and false reporting (Brenner and DeLamater, 2016; Robert et al., 2001), in which the respondents tend to provide a socially acceptable response over their true feelings. Therefore, a mixed-method approach including interviews and focus group studies could be adopted by future studies to help mitigate this issue and to provide a better understanding of the topic investigated. Further, the convenience sampling approach used in this study resulted in the oversampling of the student population; hence the use of additional data gathering approaches would help eliminate potential biases as well. Results presented in this study should also be generalized with caution due to the convenience sampling approach adopted. Future studies could further expand the sample using a randomized approach to ensure an unbiased study sample.

Second, the perception of one's ability to identify misinformation was measured based on an individual's perception of him/herself. This may not provide an accurate insight into one's ability to differentiate between fake and real news, therefore future studies should adopt other forms of assessment such as experiments in which respondents are required to differentiate fake and actual news (Allcott and Gentzkow, 2017; Silverman and Singer-Vine, 2016). Finally, a similar measurement was made in assessing if an individual has shared fake news unknowingly (i.e. respondents assumed they did in instances where they are unsure of their behaviour). Experiment-based approaches akin to the ones proposed in identifying fake news (Allcott

and Gentzkow, 2017; Silverman and Singer-Vine, 2016) could provide a more accurate insight in respondents' sharing misinformation behaviour, specifically when they are uncertain if a piece of news is fake or if they have indeed shared the said news "unknowingly".

Competing interests

None

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Supplemental material

Supplemental material for this article is available online.

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