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ARTICLE
Effect of Sleep Quality on Mental Health during COVID-19 Lockdown

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ABSTRACT

The study was done with the aim of understanding the “Effect of Sleep Quality on Mental Health of Adults during COVID-19 Lockdown”: 136 adults aged between 18 to 32 years were selected through snowball sampling from social media platforms for being a part of the study sample. The Sleep Condition Indicator (Espie, 2014) and General Health Questionnaire (GHQ-12) (Goldberg and Williams, 1988) were used to measure their sleep quality and mental health. It was hypothesized that the sleep quality will have a significant effect on the mental health of adults. It was found out that sleep quality is a significant predictor of mental health. The researcher stated that clinicians and psychologists should investigate about the sleeping patterns and quality of sleep in patients reporting mental health issues, and screen sleeping disorders regularly in population to avoid development of mental health disorders.

1. Introduction

To contain the spread of coronavirus disease, the countries throughout the world adopted lockdown, which lead to confinement in the homes. This lead to a disruption in the regular lives of everyone, along with uncertainties regarding financial security, as well as health [1]. Without any doubt, imposing lockdown was necessary for containing the spread of coronavirus. People who were under lockdown, experienced fear, uncertainty, frustration and anger which led to boredom, anxiety, uneasiness among other negative feelings [2].

During the outbreak of coronavirus, people were exposed to unexpectedly high levels of stress, and it has been concluded in previous researches that stressful events may lead to symptoms of insomnia [3,4]. Stress has been reported to be in a two way relationship with sleep throughout life [5].

During the quarantine period, the exposure to daylight was also reduced, which is important for synchronising the circadian rhythm of the body, and hence affecting the sleep and mood of the people [6]. Hence, it is very important to recognise and treat sleep related issues in people, specially during the times of stress, like lockdown and the outbreak of a deadly virus [3] as sleep is linked and considered a crucial element of psychological health, and has also been linked to psychopathology [7].

2. Review of Literature

Shamshri, Moshki and Mogharab (2014) [8] did a study “The survey of sleep quality and its relationship to mental health of hospital nurses” in Gonadan and Birjan cities. They studied 260 nurses. Pittsburg Sleep Quality Index and General Health Questionnaire were used for measuring the status of their sleep quality and mental health respectively. It was found out that 56.2% nurses had poor mental health and 43.8% nurses had good mental health. The sleep quality was poor/ unfavourable in 69.2% nurses and only 30.8% nurses reported good sleep quality.

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A statistically significant relationship was concluded by computing chi-square test.

Seun-Fadipe and Mosaku (2017) [9] did a study to evaluate “Sleep quality and psychological distress among undergraduate students of a Nigerian university”. 505 participants were selected by multistage sampling method. Pittsburg Sleep Quality Index, General Health Questionnaire, Hospital-Anxiety Depression Scale and socio-demographic questionnaire were used to assess the participants. 50.1% students reported having poor sleep quality, out of which 5.7% used to take sleep medications once or twice a week. 24.4% students had psychological distress. Also, year of study was significantly related to poor sleep quality. Also, psychological distress and depressive and anxiety symptoms were associated with poor sleep quality. It was concluded that symptoms of anxiety and psychological distress were significantly predictors of poor sleep quality. They also concluded that a significant relationship between sleep quality and psychological distress further advocates the importance of inculcating habits which improve sleep quality and mental health among undergraduate students.

Coiro et al., (2021) [10] studied the “Sleep quality and COVID-19 related stress in relation to mental health symptoms among Israeli and U.S. adults”. They collected cross-sectional data through online surveys, from 2541 community adults of Israel and USA, aged between 18-70 years. Measures related to COVID-19 related stress, sleep quality, anxiety, depression and adjustment disorder related symptoms. The results revealed that symptoms of depression, anxiety and adjustment disorder were prevalent along with poor sleep quality. Also, sleep disturbances mediated the relationship between stress related to COVID-19 and symptoms of anxiety and depression.

Freeman, Sheaves, Waite, Harvey and Harrison (2020) [11] did a review to investigate whether disrupted sleep was a contributing factor in the occurrence of mental health disorders. They concluded that insomnia and mental health conditions have some common causal factors, and along with this, they both share a bidirectional relationship with each other also. They stated that treating sleep disorders in early stages might prevent the onset of many psychiatric disorders. They also recommended that insomnia should be regularly assessed, that sleeping issues and difficulties should be treated as a problem in their own right, and at the same time should be recognized as a means to reduce the occurrence of other mental health issues, along with expansion for evidence based treatment for sleeping disorders in mental health services should be made easily accessible.

Yun (2016) [12] did a study to investigate the relationship between sleep quality and mental health of adolescents and identify the factors related to mental health. 285 middle school students were studied for this purpose. The data were analyzed using t-test, ANOVA, Pearson’s correlation coefficient and multiple linear regression with SPSS ver. 21. The mean score of sleep quality of adolescents was 4.20 and the mean score of mental health was 13.67. It was seen that the adolescents who reported having poor sleep had high score on the measure of mental health than their counterparts who had better sleep quality. Mental health had a positive relationship with sleep quality and stress. Also, it was concluded that sleep quality and stress were significant factors which affect mental health and they explained 59% variation in mental health. It was concluded that effective intervention programs for improving the quality of sleep of adolescents should be implemented for enhancing their mental health.

Ghrouz et al. (2019) [13] did a study to examine the “Physical activity and sleep quality in relation to mental health among college students”. They selected a sample of 617 college students from Indian colleges, aged between 18 to 30 years. They were assessed using three questionnaires- the Hospital Anxiety and Depression Scale, the International Physical Activity Questionnaire-Short Form, and the Pittsburgh Sleep Quality Index. They found out that the prevalence of anxiety was more than that of depression, and 51% of the participants reported that they have low physical activity levels as well as poor sleep quality. They also found out that poor sleep quality was related with depression and anxiety.

3. Objective

The objective of the study is to investigate the effect of sleep quality on mental health during the COVID-19 lockdown.

4. Hypothesis

H1: There will be a significant effect of sleep quality on the mental health of adults.

5. Methodology

5.1 Sample

The sample was collected through snowball sampling on online social media platforms. The sample size was 136 people (48 males; 88 females), aged between 18 to 32 years. Further details about their marital and employment status were also recorded. Out of the total sample 60 were employed and 64 were unemployed, and 108 were
The effect of sleep quality on the mental health of adults, during COVID-19 lockdown, and the result is shown below.

### Table 1. Regression analysis summary for predicting mental health of adults during COVID-19 lockdown.

| Model | Unstandardized Coefficients | Standardized Coefficients | T     | Sig.  |
|-------|-----------------------------|---------------------------|-------|-------|
|       | Std. Error                  | Std. Error                | Beta  |       |
| 1     | (Constant)                  | 30.774                    | 1.634 | 18.831| .000  |
|       | Sleep Quality               | -.334                     | .101  | -3.319| .001  |

The table shows that the adjusted R² is 0.076. A simple linear regression was calculated to predict the effect of sleep quality on mental health of adults during COVID-19 lockdown. A significant regression equation was found (F (1,134)= 11.01, p<0.01), with an R² of 0.076. Mental health is increased by 7.6% for increase in each unit in sleep quality. The correlation coefficient was computed to be -0.276. A higher score on General health Questionnaire indicates worse condition, and a higher score on sleep quality indicates better sleep quality, so a negative relationship here depicts that better sleep quality is related with better general (mental) health.

The value of regression analysis is statistically significant, and hence it can be stated that the effect of sleep quality on mental health of adults in India, during COVID-19 lockdown is significant. The hypothesis has thus been accepted.

### 6. Discussion

The results of the study reveal that there is a direct causal relationship between sleep quality and mental health of adults, and thus the hypothesis has been accepted. It can also be stated that sleep quality directly affects mental health of adults, and it did so during the lockdown that was imposed by the government during the outbreak of COVID-19 virus. A poor sleep quality is directly related to poor mental health and vice versa. So if people who had disturbed sleeping patterns and had poor sleep quality, reported that their mental health was also worse in contrast to people/adults who had better sleep quality.

Hence, for improving the overall mental health of people, especially during stressful times, like lockdown, clinicians should focus on the steps for improvement of sleep quality.

Some factors which contributed to poor sleep quality in some adult groups during lockdown were irregular...
working hours, disruption of sleep-wake cycle, lack of physical activity, increased screen time, stress related to finances, job insecurity, underlying health conditions and COVID anxiety. Poor sleep quality is a significant predictor of deterioration in mental health, and so it can be concluded that people suffered with disturbed mental health during the tough times. And clinicians and psychologists can thus, investigate their sleep quality and patterns to help them deal with their mental health issues more effectively. They can provide their patients with practices and techniques to enhance their sleep quality, like sleep hygiene and relaxation techniques.

In clinical setups also, when patients report poor mental health and other mental health related issues, clinicians can look for sleep related issues to have a better understanding. And, patients who report poor sleep, can also be screened for potential mental health deterioration.

Similar results have been quoted by other researchers. In a review done by Freeman, Sheaves, Waite, Harvey and Harrison (2020) [10], it was stated that insomnia and mental health conditions share a bidirectional relationship. They recommended that insomnia and other sleep issues should be assessed regularly in case of mental health disorder.

The results of this study are important because it provides a pathway for understanding the importance of sleep and related issues in psychiatric conditions, and poor mental health of individuals. The results help us to realise the importance of exploring the sleep quality of people who report other mental health related conditions, like stress, depressive symptoms, anxiety, emotional disturbance etc., and how identifying sleep difficulties in preliminary stages can prevent occurrence of mental health disorders. This study contributes to the literature which establishes a cause and effect relationship between poor sleep quality and mental health issues, and provides an evidence to clinicians for the same.

The researchers who wish to pursue and explore this relationship further, may also try to investigate the existence of gender differences, if any, and how mental health also contributes to disturbed sleeping patterns. Also, they may explore this further in non-stressful times. This study was done during COVID-19 lockdown in India, and so the results may have been influenced by other factors that played a role in times of widespread stress, so replicating the results in times when everything is regular on national/community level, may strengthen the evidence even further. Also, this relationship may be tested for different age groups, along with comprehending what else contributes to poor mental health apart from poor sleep quality.

7. Conclusions

The study was done with the aim of understanding the “effect of sleep quality on mental health of adults during COVID-19 lockdown”. 136 adults aged between 18 to 32 years were selected through snowball sampling from social media platforms for being a part of the study sample. The Sleep Condition Indicator (Espie, 2014) and General Health Questionnaire (GHQ-12) (Goldberg and Williams, 1988) were used to measure their sleep quality and mental health. It was found out that sleep quality is a significant predictor of mental health.

Hence the study concludes that sleep quality affects the mental health of the adults significantly, and it was a significant predictor of adults’ mental health during the COVID-19 lockdown.

The researcher, based on the results, suggests the clinician to screen for insomnia and other sleep issues in early stages of treatment, to prevent the patients from developing mental health disorders later, and also screen for sleep related disorders and issues in patients who report poor mental health.

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ARTICLE

Animal Assisted Therapy: It’s Implications among Disorders, for Therapeutic Practice, and in Health and Well-being

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ABSTRACT

Till the time one has not loved an animal, a part of one’s soul remains unborn. Animal Assisted Therapy can be used in amalgamation with other forms of therapy. The animal becomes an assimilation of the therapeutic plan with AAT. Many psychological disorders have been shown to react well to Animal-Assisted Therapy (AAT). The article is a concise literature review on Animal Assisted Therapy of database available from the studies that were integrated and provided a general understanding of the perceived benefits of Animal Assisted Therapy and includes topics that are categorised as an Introduction to Animal Assisted Therapy: how it can help people with disorders, its utilisation in therapeutic practice and its relation to our health and well-being. Papers were considered eligible if they satisfied the following pre-determined criteria: (1) Talked about Animal Assisted Therapy in context to well-being of an individual, (2) Talked about implications of Animal Assisted Therapy in context to disorders and (3) Showed benefits of Animal Assisted Therapy in counselling. This paper further provides an overall review of Animal Assisted Therapy. Relevant data was summarized and collated to make a narrative account of the findings that animal in the therapy would not make it more difficult, but rather make it easier, the therapist be aware of any animal-related allergies when employing animals as adjuncts and animals can help have a better emotional and physical healing experience by the patient.

Keywords:
Animal assisted therapy
Well being
Therapeutic practice
Health
Disorders

1. Introduction

Animal Assisted Therapy (AAT) is the application of animals as a therapeutic modality to help heal and rehabilitate patients with acute or chronic diseases or illnesses. In Animal Assisted Therapy, animals are used in goal directed treatment methods or sessions. These goals can be physical, mental, emotional or social which further help in overall well-being of an individual. Positive psychological related benefits have been associated to the presence of animals for companionship. Animals have a long tradition of being used in therapies. Much work has been undertaken to identify and explain the essence and forms of these approaches, as well as to investigate their efficacy which is ability to achieve the desired or expected outcome under a regulated testing context and effectiveness as the field has advanced and that is how the therapy works in real-life practice. The term AAT commonly refers to the companionship of an animal aiming to provide a positive impact on human health and well-being. AAT is given by a professionally trained specialist with expertise within the field of their practise, who considers optimising the participants’ physical, cognitive, mental, and/or socio-emotional functioning.

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Newly studied and improved intervention studies, as well as an analysis of the underlying mechanism of human reaction to the companionship of friendly animals as a stimulus, are necessary to accept AAT into conventional or unorthodox treatment practises as a novel therapeutic modality (Palley, O’Rourke and Niemi, 2010)\(^8\). According to Barak et al. (2001)\(^2\), further research is required to determine the fundamental causes of AAT that result in clinical improvements. The conclusions from these trials can be useful in determining how the approaches perform and implement best-practice practises.

The interaction between animals and patients creates an atmosphere that allows patients to communicate more effectively, boost their self-confidence, decrease sickness symptoms, and improve their overall satisfaction (Evans and Gray, 2012)\(^7\).

The technique of incorporating animals into therapeutic contexts is evolving in animal-assisted interventions (AAIs), and as a result, there has been a growing scholarly interest in human health outcomes during the last decades. Research efforts into the perspective of Animal Assisted Therapy have little consensus on the impact of such interventions in therapeutic practice. This paper aimed to contribute to the limited body of knowledge by reviewing various available studies on Animal Assisted Therapy and compiling it in one. Moreover, discussion of theoretical and methodological issues, implications for practice and suggestions for future research are provided.

### 1.1 Animal Assisted Therapy among Disorders

The integration of therapy dogs with people with dissociative disorders was outlined by Arnold (1995)\(^1\). The dog’s soothing impact, aptitude and capability to warn the therapist early to clients’ concern, and improved communication and engagement were determined to be benefits. Psychiatric patients who are reclusive and nonresponsive have been reported as smiling, hugging, and communicating to a therapy dog (Voelker, 1995)\(^24\). When a therapy dog was present, it was connected with reduced heart rates and noise levels in elderly dementia patients (Walsh, Mertin, Verlander and Pollard, 2010)\(^22\). When a therapy dog was present, patients with Alzheimer’s disease had considerably enhanced sociability behaviour (Wilson and Turner, 1997)\(^23\).

Children with pervasive developmental disorders (PDD) defined by a lack of social skills and abilities were subjected to three distinct situations in a research done by Martin and Farnum (2002)\(^14\). Children were exposed to three distinct situations: (a) a non-social toy(ball), (b) a stuffed dog, and (c) a real dog. Both behavioural and linguistic elements of prosocial and non-social encounters were assessed. When a therapy dog was present, children had more lively mood, were more focused, and were more aware of their social surroundings, according to the findings. These studies imply that engagement with dogs may have special advantages for this demographic and that animal-assisted treatment may be beneficial form of therapy.

Animal-Assisted Therapy reduces state anxiety to a significant degree. Dogs may provide an extra therapeutic benefit by reducing anxiety and improving psychotherapy tactics and motivation of patients and therapists (Hoffmann et al., 2009)\(^10\). Animal-assisted treatment was linked to lower levels of state anxiety in hospitalised clients with a spectrum of medical diagnoses, while a regular therapy leisure experience was linked to lower levels only in mood disorder patients (Barker and Dawson, 1998)\(^3\).

### 1.2 Animal Assisted Therapy in Therapeutic Practice

Animal Assisted Therapy in counselling that is AAT-C, is the confluence of pets as therapeutic medium in the counselling procedure. AAT-C has a lot of applications but the most preferred model is that for therapists to work in integration with their own pets; a pet that has been evaluated and is fit for such work because a counsellor is most familiar with his/her own pet and is very well aware of their pets’ emotional and behavioural reactions. An adolescent who has been the victim of abuse might be an example of AAT in a mental health counselling session.

To teach the notion of acceptable contact and delicate interactions, softly touching and communicating to a dog or cat: The combination of a warm and loving therapy pet and a human therapist strengthens the child’s pleasant experience (Chandler, 2017)\(^6\).

According to Kruger et al. (2004)\(^12\) and Beck et al. (1986)\(^4\), a practitioner who performs counselling with an animal present may feel less intimidating, and therefore the client may be more likely to reveal himself or herself. A friendly animal can make a person see the therapist in a more positive light. Peacock (1986)\(^19\) confirmed this belief, reporting that when children were interviewed in the company of her puppy, they became more happy and friendly during their encounter. She came to the conclusion that the dog helped to ease the initial stress and create a positive environment. There has been a slew of experiments that have come up with comparable results.

According to Odendaal and Meintjes (2003)\(^17\), animals have a soothing effect on humans and alleviate arousal. Tactile interaction with a dog was related to experimentally induced low blood pressure in their analysis. When it comes to choosing animals for therapy,
therapists must make informed decisions. Not all animals are suitable for use as adjunct therapists. When it comes to bringing animals into psychotherapy, a clinician must think carefully if the animals will serve the role in growth. This may include further research and the purchase of animals that are ideally suited to his or her needs (Fine, 2010) [8]. However, a lack of experimental data can continue to obstruct AAT’s recognition, especially as people grow more sceptical of evidence-based psychotherapy.

1.3 Animal Assisted Therapy in Relation to Health and Well-being

A study conducted by Macauley (2006) [13] explored the effects and effectiveness of animal-assisted therapy (AAT). Three males with aphasia from left-hemisphere strokes were given one term of standard therapy followed by one term of AAT to investigate the benefits and efficacy for people with aphasia. Both methods were effective, and each participant reached his objectives, but there were no significant variations in test outcomes between those who had standard speech-language therapy and those who did not. In contrast to traditional treatment, the results of a client satisfaction investigation revealed that each participant was more motivated and calmer, liked the treatment session, and rated the environment of the sessions as light and less stressful during AAT.

Another study conducted by Roenke and Mulligan (1998) [21] on patients of a long-term care facility and discovered that there are four criteria that contribute to the advantages gained by participants: (a) Humanity; (b) Anticipation and Consistency; (c) Reminiscence Capacity; and (d) Social Aspects. Furthermore, 6 neurochemicals were linked to a reduction in blood pressure in people (n=18) and dogs (n=18) before and after a pleasurable encounter, demonstrating that the neurochemicals implicated and attention-seeking behaviour had increased significantly in both species. This database can be used to justify the use of animals in treatment (Odendaal, 2000) [16].

A study takes up by Richeson (2003) [20] used the Cohen-Mansfield Agitation Inventory and the Animal-Assisted Therapy Flow Sheet to analyse the influence of a therapeutic recreation intervention employing animal-assisted therapy (AAT) on the agitated behaviours and social interactions of older individuals with dementia. 15 nursing home residents with dementia took part in a daily AAT intervention for three weeks and demonstrated statistically significant reductions in agitated behaviour and an increase in social contact from pre- to post-test. Human-animal bonding has been linked to lower blood pressure, heart rates, and stress levels, as well as increased emotional well-being and social engagement, according to studies (Jorgenson, 1997) [11].

2. Methodology

A comprehensive systematic review was conducted. The articles included provided experimental or review-based evidence, qualitative or quantitative psychological or psychosocial outcomes pertaining identifying studies integrating animals into mental health treatments for people with disorders, it’s utilisation in therapeutic practice and its relation to our health and well-being. Different data resources were combined to gain insight towards the aim of the article. The majority of the articles in this review came from peer-reviewed scientific journals, with some online resources incorporated to provide the entire scope of the subject. The following databases were searched: APA PsycNET, NCBI, Research Gate, and Academia. Outside of these databases, Google Scholar was used to explore for articles. Citations from journal studies were also examined and added if they were applicable. Papers were considered eligible if they satisfied the following pre-determined criteria: (1) Talked about Animal Assisted Therapy in context to well-being of an individual, (2) Talked about implications of Animal Assisted Therapy in context to disorders and (3) Showed benefits of Animal Assisted Therapy in counselling. The following terms were used in the search: Animal Assisted Therapy, Therapeutic Practice, AAC, Animal Therapy and Disorders, Animal Therapy and Well Being.

3. Results and Discussion

Animal encounters have been used clinically in a variety of contexts, with confirmed effects for psychiatric and other medical patients in terms of reducing affective disorders and enhancing human interactions. Few experiments of AAT for medical patients have been conducted, and the majority of these studies have focused on patients who deal with dogs. In older patients with schizophrenia, canine-assisted interactions have been linked to acute improvements in anxiety or depression, as well as increased cognitive functioning, but not with impulse control. Animal Assisted Therapy is a technique for overcoming stress and isolation brought about by staying in a residential care facility, as well as increasing pleasure and life satisfaction (Nazarian et al., 2018) [15].

Animals can be a valuable addition to a therapist’s framework when it comes to supporting people. Some clinicians may remain wary of the medicinal importance of the animal/human relationship, and may initially undervalue the therapeutic efficacy of animals. There is a wide gap in the feasibility of this method due to a
lack of documentation and rigorous review of outcome analysis. Animals can be used by interested practitioners exclusively to establish rapport with clients. A professional and well-informed clinician, on the other hand, should be able to consider a wide range of advantages that animals can have. To incorporate animals into one’s therapeutic arsenal, a therapist can make certain changes to his or her treatment methodology.

Careful procurement of therapeutic animals, stringent veterinary care and supervision for the animal, and informed consent from all parties concerned are all safeguards. Allergies, zoonoses, and future injuries can be greatly avoided as proper veterinary procedures are followed by both the animals and the patients (Brodie et al., 2002). However various gaps could be found where further research can be done keeping in mind the implication of AAT in India as it is a relatively new therapy in India. Lack of knowledge, differentiating cultural values and fear of animals, safety risks among individuals, therapist education, and financing are all problems encountered by therapists in work, as per research. The value of education/wellness awareness regarding this methodology, preparation criteria, reporting requirements, and outcome-based trials is important (Gayathri and Priscilla, 2018).

4. Conclusions

The current database found pertains to effectiveness of Animal Assisted Therapy in treatment of various disorders, for utilisation in therapeutic practice and enhancing the overall well-being of an individual. This would imply that the addition of the animal would not cause the treatment to become more difficult rather would make it smoother. When using animals as adjuncts for specific clients, the clinician should be mindful of any animal-related fears or allergies. Animals can improve the healing experience mentally and physically by making it more available to clients.

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ARTICLE
Retraction: Psychological Risk Factors of Terrorist Offenders in Indonesia

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1. Introduction

The number of research papers focused on terrorism has increased dramatically since the 9/11 tragedy [1]. They have produced many etiological theories and opinions regarding pathways to terrorism [2]. Nevertheless, there remains a deficiency of empirical research into terrorism [3,4]. There has been limited valid and systematic examination of individual risk factors for terrorism [5]. The deficiency of empirical research on terrorism risk assessment and effective rehabilitation is caused by many factors; however, it is assumed to be primarily because of the difficulty in engaging with terrorists [6] and confidentiality and the sensitivity of the issue [7], making research and publication very challenging. Furthermore, there is a potential that terrorism researchers may be subjected to close and critical observation and suspicion from both authorities and terrorism networks alike [8].

In terms of investigation into individual terrorism risk factors, there is an increasing debate among scholars (in Criminology and Forensic Psychology) regarding whether general criminal risk assessment methods are applicable to assessments of terrorism risk. LaFree and Dugan [9] highlight five conceptual similarities and six conceptual differences between terrorism and general crime. The similarities include (1) both studies of terrorism and common crime are intensively interdisciplinary, (2) terrorism and general crime are social constructions, (3) for both, there are wide discrepancies between formal definitions and the practical applications of these formal definitions, (4) terrorism and general crime are committed by young males, and (5) sustained levels of terrorism and sustained levels of common crime destabilize social trust. The differences include (1) terrorism activities usually constitute multiple crimes, (2) the response to general crime seldom goes beyond local authorities, unlike terrorism, (3) the offenders of common crimes are

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typically trying to avoid detection, in contrast to terrorist offenders who are looking for maximum attention and exposure, (4) terrorism is typically used as a tool directed at wide-ranging political goals, unlike common crime, (5) terrorist offenders have higher goals, thus they see themselves as altruists, and (6) in terrorism, offenders change their criminal activities over time and are more likely than general criminals to revolutionize. LaFree and Dugan assert that finding the dissimilarities between terrorism and general crime are no more challenging than dissimilarities between general crime and more specialized crimes (i.e., gang activity, organized crime, hate crime, or domestic violence). Likewise, Rosenfeld refutes the concept that terrorism is qualitatively dissimilar to any form of violence criminologists’ study. In the field of forensic psychology, the application of contemporary approaches to general violence risk assessment to the field of terrorism is challenged by Demevik, Beck, Grann, Hoge, and McGuire. Further, they argue that findings from studies on mentally disordered offenders and general violence perpetrators may not be relevant to the prediction of recidivism in those who engage in politically motivated violence perpetrators may not be relevant to the prediction of recidivism in those who engage in politically motivated behavior. Responding to this dispute, Monahan argues that valid individual risk factors for terrorism have to be identified before determining whether contemporary terrorism risk assessment approaches can be applied to terrorism risk assessment.

In Indonesia, how to assess terrorist offenders and foreign terrorist fighters coming back from several conflicting zones is unclear, hence security agencies are still making efforts to create specific constructs and scales. The current instruments of CVE (Counter Violent Extremism) in Indonesia are merely assessing religious radical extremism, not risk and need factors of offenders after being detained. The government calls for a need to apply extremist screening tests at schools and government offices due to the lack of knowledge and research on risk factors. After detention, several security agencies simply categorise perpetrators into unclear categories (e.g., ‘radical vs non-radical’, ‘cooperative vs non-cooperative’, and ‘capable vs not capable to make bomb’) further, some Western instruments for terrorists in Indonesian prisons do not thoroughly fit into Indonesian context and culture.

Against this background, ‘MIKRA’ Motivation-Ideology-Capability (MIC) Risk Assessment was developed to identify individual criminogenic risk factors and needs (“Risk-Need”) of terrorist offenders in Indonesia. This study was formulated to set up future parameters of effective rehabilitation/responsivity to terrorism. The study was inspired by Psychology of Criminal Conduct (PCC) which emphasizes the identification of Risk and Need of criminal offenders, before Responsivity (RNR) or rehabilitation/treatment. PCC itself is holistic and multidisciplinary and open to the contributions of any discipline in explaining individual differences in the criminal behavior of individuals.

The study was conducted in Indonesia which is aimed to increase knowledge to contribute to the risk assessment of ideology-based terrorist offenders in Indonesia, particularly to define their individual risk factors.

2. Causes of Terrorism

Schmid collected 109 academic definitions of terrorism and argued that the number of available definitions of terrorism might be similar to the number of published experts in the field. Hence, the lack of consensus is undeniable and expected. Given the variety of terrorist offenders’ behavior, the various declared or assumed motivations, and the question of whose perspective is accepted, the terrorism offenders’ behavior is subject to interpretation. In other words, one man’s terrorist is another man’s freedom fighter. Nevertheless, two elements are commonly found in contemporary definitions of terrorism: 1. terrorism involves aggression against non-combatants, and 2. instead of accomplishing a political goal, terrorist action in itself is expected by its perpetrator to influence a targeted audience’s behaviors, to meet the goals of the terrorist.

Terrorism is complex and multifaceted, and actors involved can be classified across multiple variables. Schultz, in Victoroff, suggested seven variables (cause, environment, goal, strategy, means, organization, and participation), could be used to classify terrorism into two higher-order types, revolutionary versus sub-revolutionary terrorism. Post, Sprinzak, and Denny divide political sub-state terrorism into 1. social revolutionary terrorism, 2. right-wing terrorism, 3. nationalist-separatist terrorism, 4. religious extremist terrorism, and 5. single-issue (e.g., environmental issue) terrorism and argues that each type tends to be linked to its own social-psychological dynamics. Victoroff identified numerous variables relevant to understanding terrorism and how dimensions of these variables could be classified, such as individual vs group, state vs sub state vs individual, secular vs religious, and suicidal vs non-suicidal.

In Indonesia, Mufid, Sarwono, Syafii, Baedowi, Karnavian, Zarkash, and Padmo studied terror perpetrators by interviewing 110 terrorists. He found that 87.8% of the terror perpetrators in Indonesia were Muslims, while 12.2% were Christians involved in ethnic-religion conflicts. The majority of terror perpetrators in...
Indonesia in this study were Indonesians (92.2 percent). The remainder were Malaysians (7%) and Singaporeans (0.9%). Further, most terror perpetrators were ethnically Javanese (43.6%), followed by Pamonese (12.7%) and Malays (10.9%). Buginese and Sundanese respectively constituted 5.5% of participants, while 4.5% were Betawi. The rest, 17.3%, came from various ethnic backgrounds, including Acehnese, Ambonese, Arab, Balinese, Bima, Indian, Kaili, Makassar, Madurese, Minang, and Poso. Moreover, related to age (age of respondents was calculated from the year of their involvement in acts of terrorism), the average age of terror perpetrators was 29.7, with the youngest 16 years and the oldest 64 years. If classified according to the age group, the majority (59%) were young, below 30. Related to level of education, Mufid et al. \cite{44} found that the highest level of educational attainment of most terror perpetrators was senior high school (63.3%), followed by college and university (16.4%) and junior high school (10.9%). In addition, 5.5% of terrorist offenders attended, but did not graduate from a college or university and another 3.6% only graduated from primary school. These findings are similar to research in other countries. For instance, a study of 102 Salafi Muslim terrorist offenders from Saudi Arabia, Egypt, France, Algeria, Morocco, and Indonesia found that the average age of perpetrators (joining in terrorism acts) was 25.7 years, with 18% described as ‘upper’, 55% from ‘middle’, and 27% from a ‘lower’ class \cite{40}.

Mufid et al. \cite{44} found that in Indonesia, most terror perpetrators had non-religious educational backgrounds. Around 48.2% of terror perpetrators interviewed graduated from secular senior high schools, 16% from non-religious colleges or universities, 10.9% from junior high schools, and 6.4% from vocational senior high schools. Only 5.5% graduated from pesantren (Islamic traditional boarding school) and 3.6% from a madrasah (Islamic school). On the other hand, this finding does not confirm a common perception held by many (foreign) observers that most Indonesian terrorist offenders came from religious schools such as madrasah and pesantren. On the other hand, this finding supports a 2010 survey reporting a significant level of radicalism among students of general secondary schools.

3. Motivations of Terrorism

Related to typology of terrorist offenders in Indonesia, Mufid et al. \cite{44} reported that the roles of 110 terror perpetrators in Indonesia can be classified into leaders (9.1%), middle management (10%), and followers (80.9%). His study also found various factors that motivated individuals in Indonesia to engage in acts of terrorism: religious-ideological, solidarity-driven, separatist, ‘mob mentality’, and situational. An ‘ideological-religious motive’ is defined as the drive to establish the perfect model of religion-based government or society (the establishment of dawlah Islamiyah or the implementation of sharia) where acts of violence or terrorism are considered as a justified means to achieve these ideals. Included in this category is participation in terrorism that is driven by the abhorrence of the Western economy-political domination, cultural hegemony, and military interventions in Arab or Muslim-dominated countries. Participation in acts of terrorism for the purpose of protecting fellow believers from the threat of conversion attempts conducted by other religious communities is also included in this category.

A ‘solidarity motive’ is defined as the drive to participate in acts of terrorism to help fellow believers especially in a situation when they are threatened or become victims in a conflict. The ‘revengeseeking motive’ is identified as the drive to join in terrorism acts as an attempt to strike back against enemies or losses (of lives or property) that may have been experienced by the terrorist actor or their family. A ‘separatist motive’ is defined as the drive to participate in terrorism as a way to meet a political goal, of creating a separate state. ‘Mob mentality’ is the drive to spontaneously participate in acts of violence or terrorism that are initiated by others, even though the perpetrators do not have clear reasons, their behavior is simply in response to the behavior of others. Finally, ‘situational motives’ refers to factors that forcibly drive individuals to be involved in acts of terrorism. For example, individuals who are convicted of terrorism offences through association other terrorism perpetrators, even though they do not directly participate in acts of terrorism themselves \cite{43}. Based on the above categories, most terror perpetrators in \cite{44} study were driven by ideological-religious motives (45.5%), followed by a sense of community solidarity (20%), mob mentality (12.7%), revenge-seeking (10.9%), situational (9.1%), and separatist motives (1.8%). The finding confirms that religious-ideological motives, despite variation of their meanings, were predominant reasons that motivated perpetrators to participate in terrorism acts in Indonesia.

There is certainly no single explanation about why and how Islamic radicalism has come into its existence in Indonesia. Largely, two main factors give the reasons of the emergence of Islamic radicalism, internal and external factors \cite{35}. The internal factors are disputes among Muslim elites which have driven Islamists to revive the spirit of Islam. On the contrary, external factors
include outer drives, such as colonialism or invasion [36]. Roy [37] describes that among the leading factors causing the birth and rise of Islamic radicalism is external factors beyond religion such as economic discrepancy and social confusion. Ideology serves as a catalyst or mass-mobilizing factor that escalates radicalization level of religious understanding delivered by religious charismatic leaders or ideologues [38]. Dekmejian [39] also previously suggests that there is a continuing pattern of history in the form of a cause-and-effect correlation between social crises and the rise of religious, revolutionary, or revivalist movements. Mufid et al. [34] argue that in Indonesia economic factors such as poverty and social inequality are insufficient structural factors, and do not necessarily contribute to a rise in terrorism. Instead, a combination of structural factors at global, national, and sub-national levels are significant factors for the rise of terrorism.

Religious radicalism in Indonesia has such an extensive history [34]. In contrast with the current Indonesian society, religious radicalism in the colonial period gained support from the majority of people in the country as the radicals was to fight against Western colonialism and to achieve Indonesia’s independence in 1945. After Indonesia value freedom of speech in the Era of Reformation followed by economic recession in 1997, Islamic radicalism proves its existence after ‘devoid leadership’. The economic crisis was used by some Islamist ideologues to bring together a wider audience. Hibzut Tahrir Indonesia (HTI), for example, came to Indonesia’s political stage with a distinguished slogan: “Selamatkan Indonesia dengan Syari’ah” (Save Indonesia by Applying Sharia Law). Due to the financial crisis, radical Islamist groups gained support from their sympathizers in promoting their ideology.

Ideology-based terrorism in Indonesia is related to a desire to establish an Islamic state or caliphate Khilafah Islamiyah ‘alâ minhajin shi‘bîyyah (as Islamic caliphate on the precepts of methodology). An underground movement in Indonesia, Jamaah Islamiyah (JI) and its affiliates, set this goal. JI became an umbrella organization for radical movements with long historical and ideological ties to the ISL (Darul Islam/Negara Islam Indonesia) [23]. The expansion of terror attacks in Indonesia occurred by targeting individuals including Muslims whom are perceived as thaghut (evil) [23,41,42]. Pepy Fernando’s group, for example, committed terror actions through ‘book bombs’ against individuals suspected of having close relations with the Western thoughts. Packages of book bombs were sent to Ulil Absar Abdallah (an activist of Liberal Islam Network), Ahmad Dani (a musician accused of having Jewish descent), Yaptu (a leader of a youth organization), and General Gorries Mere (a police officer regarded as the Western ‘puppet’ in the war against terrorism in Indonesia) [34].

According to Imam Samudra, Muklas, and the perpetrators of the 2002 Bali bombing, the terror actions in Indonesia were justified according to six fundamental teachings of Salafi-Jihadist: 1) the United States and its allies lead a conspiracy to destroy Islam, 2) non-Muslims, including Protestants and Jews, are infidels and enemies of Islam, 3) killing of civilians is allowed if it is part of revenge against the United States and its allies for the killing of Muslims around the world, 4) both Americans and non-Americans who cooperate with the United States government are enemies because they pay taxes to make war possible and through actions, they choose the government officials who lead that war against Muslims; hence there is no difference between civilians and combatants, 5) Islamic leaders cooperate with the United States and its allies are thaghut or the enemy of Islam, and must be regarded as infidels, and 6) the death of innocent Muslims during the Mujahidin attacks are acceptable for the sake of Muslim interests [34].

Acts of terror committed by Indonesian religious mutants in diverse places, targeted various foreigners, involving different actors, with different recruitment techniques; this is demonstrated by the first Bali bombing in 2002, the JW Marriott bombing in 2003, the Australian Embassy bombing in 2004, the second Bali bombing in 2005, and the JW Marriott and Ritz Carlton bombing in 2009. Their goal remains the same, to establish of dawlah Islamiyah (Islamic State) and implement Shariah (Islamic law) [34]. As terror actors engage in various types of crimes (e.g., fa‘i and robbery, bombing, murders, and so forth) linked to military trainings/tactics and global networks, terrorism is accordingly seen as a ‘non-ordinary’ crime [46,47].

During criminal investigation offenders claim that what they did was not an act of terrorism but based on their understanding of the word ‘jihad’. Jihad alone, according to their ideological perspective, is an instrument to pursue a goal to establish an Islamic state and to apply Islamic law [44,47–49]. An act of terrorism committed by a religious group can be regarded as a religious activity since it is based on religious doctrines/principles. Therefore, many perpetrators of terrorism deny that their group’s activities contain terrorism [50].

The review of ideology-based terrorism in the context of Indonesia shows that the terrorist offenders are driven or inspired by many factors including religious doctrines, in this case is Islam as the most common religion in the country. The literature review indicates that there are at least three psychological domain of offenders in
Indonesia which can be assessed for identifying risks: 1) motivation, related to internal/individual’s drivers which may connect with external factors such as political turbulence and economic discrepancy; 2) ideology, related to individual’s belief systems and radical doctrines; and 3) capability which includes an individual’s hard and soft skills which can be used to support terrorism; therefore this study focuses on ‘Motivation, Ideology, Capability (MIC or MIK in Indonesian spelling) Risk Assessment’ or ‘MIKRA’. These MIC psychological domains lie within micro level (individual level) regardless the affiliation they are in such as JI, ISIS, and Al Qaeda (external factors).

As this study aims to identify individual terrorism risk factors of offenders in Indonesia, findings may be used by service providers responsible for the design and implementation of terrorism rehabilitation efforts, such as reducing the level of each risk factor to prevent recidivism. The study collected information from Indonesian eminent counterterrorism experts and practitioners, including terrorism intelligence analysts, investigators, and heads of security units who first-handedly examined terrorist offenders’ cases. The major question in this baseline study is “What are the psychological criminogenic risk factors of terrorist offenders in Indonesia?”.

4. Methods

4.1 Participants

A total of thirty-two people between the age of 35 and 68 (mean: 46) participated in this study. These participants were eminent Indonesian counterterrorism experts (i.e., counterterrorism senior advisors, intelligence analysts, criminologists, and members of government think tanks), practitioners (i.e., in deradicalization programs and rehabilitations), and professionals (i.e., heads of government counterterrorism agencies and units) (twenty-seven males, and five females). Names of participants were carefully selected based on their nation-wide recognized and documented products (i.e., researches, analysis, investigations, deradicalization programs, open-sourced or security unit internally-used) and official positions in Indonesian counterterrorism. Participants’ roles in counterterrorism were diverse, including security analyst, advisor, investigator, deradicalization and disengagement program designer (inside and outside prisons), military commander, theology, counter narrative designer, terrorism prosecutor, special task force/field officer, forensic analyst, intelligence operator, cyber terrorism analyst, and senator member at the House of Representatives. The participants’ experiences in counterterrorism ranged from five to thirty years.

4.2 Procedure and Material

This study involved counterterrorism experts, practitioners, and professionals. The study included procedures of data collection such as reviewing nationwide names in the field of Indonesian counterterrorism, approaching and corresponding with candidates of participants, gaining informed consent from participants, and conducting thirty-two semi-structured interviews with participants as data was gathered using this technique. After reviewing names recommended by Indonesian counterterrorism forums, security units, and executive government think tanks, fifty names of potential candidates were collected. The potential candidates were approached and provided with a description of this study. Thirty-two people expressed their application and interest in taking part in the study; all committed to participate in the study. Appointments in Jakarta, Indonesia, to conduct interviews were then scheduled. Each participant was given a copy of the informed consent form to be signed and asked about the use of recording equipment during the interview. From a total of thirty-two participants, thirty-one participants signed the consent form, whilst one in a top-rank ministry position was unwilling to sign which reflected sensitivity of terrorism research in Indonesia. The researcher requested to have his photograph taken with the researcher to replace his signature in the form. In those cases where the participant refused to sign a consent form, the preparedness to organize a time and place for the interview and participation indicated consent. Given the participants were mostly seniors, these conditions assured consent was informed and voluntary. Furthermore, all participants refused to have the interview recorded. Thus the researcher performed note-taking.

The interviews used the list of questions set in interview guideline shown in Table 1. The interviews initially asked for participants’ comments in open-questions and then probed the participants with further questions. Thirty-two semi-structured in-depth interviews were conducted in four months, from late September until December 2015, and renewed in September 2020 through online during the Covid-19 pandemic. All interviews took place in Indonesia and were conducted in Bahasa Indonesia. Each interview lasted between thirty to ninety minutes. During interviews, most participants provided simple answers due to the sensitivity of issue, culture (Indonesians are not outspoken), and concern of their safety; hence, probes to stimulate participants were needed. The 1st probe was related to the “central eight” risk/need factors in PCC Theory. The 2nd probe was focused on Motivation, the 3rd
was Ideology; and the 4th was related to Capability. Before ending each interview, the researcher read the written notes and showed it to the participant as a verification.

Table 1. Interview guidelines for study on risks and needs of ideology-based terrorist offenders

| Questions                                                                 |
|--------------------------------------------------------------------------|
| Given your expertise and experiences in the terrorism field, what do you think are the risk factors to be considered when assessing ideology-based terrorist offenders? Can you define each of these risk factors? |
| 1st probe:                                                               |
|   - What about anti-social attitudes?                                    |
|   - What about anti-social peers?                                        |
|   - What about anti-social personality?                                  |
|   - What about history of anti-social behavior?                          |
|   - What about family or marital factors?                                |
|   - What about the lack of achievement in education or employment?       |
|   - What about the lack of pro-social leisure activities?                |
|   - What about substance abuse?                                          |
| 2nd probe:                                                               |
|   - What about chances to do violence?                                   |
|   - What about motives such as solidarity, revenge?                      |
|   - What about vulnerability?                                            |
|   - What about superiority or level in terrorism group?                  |
|   - What about support from terrorism group?                             |
|   - What about outreach in terrorism network?                            |
| 3rd probe:                                                               |
|   - What about doctrines?                                               |
|   - What about targets of enemies?                                       |
|   - What about the understanding on contexts?                            |
|   - What about militancy?                                               |
|   - What about attitudes?                                               |
|   - What about loyalty to leaders?                                       |
| 4th probe:                                                               |
|   - What about reputation in terrorism group?                            |
|   - What about weapon skills?                                            |
|   - What about military training?                                        |
|   - What about negatively-interpreted knowledge about religious beliefs and strategies? |
|   - What about social domination skills such as recruiting, influencing, and manipulation skills? |
|   - What about experiences in combat areas?                             |

4.3 Analysis

This study used qualitative analysis on participants’ answers. Qualitative thematic analysis was used to define criminogenic psychological risk factors. A total of 222 risk factors were revealed prior to thematic analysis (TA). As the research is a baseline study which involved multidisciplinary experts/practitioners in counterterrorism, many words mentioned by participants were very technical; hence, the researcher asked for clarification.

In the TA, participants’ answers were then tabulated, coded, and categorized into similar themes. External ‘un-controllable’ risk factors (e.g. recruitment style in groups, networks, chance to commit terror act, support from violent groups, and anti-social associates) were excluded as this study only focused on internal risk factors. The TA combined inductive (themes were chosen taking from one of the participants’ answers which represented the whole idea of risk factors), deductive (themes were taken from existing concepts of terrorism from previous researches), latent (themes were taken from concepts and assumptions underpinning the risk factors raised by participants), and constructionist approaches (themes constructed certain reality created by participants’ answer). In other words, a name of the theme might be chosen even though the term was weak in quantity (but strong in quality) because it incorporated a broader meaning or concept, for example the theme ‘Mechanical and Electrical (M and E) Skills’ was chosen to incorporate these terrorism skills stated by participants: 1) “aeromechanical”, 2) “weapon/gun-assembling”, 3) “aeto-mechanical”, 4) “electromechanical”, 5) “drone-assembling”, 6) “aerodynamic”, 7) “mechatronic”, 8) “mechanical and electrical skills” was only mentioned once. This is due to its coverage and presented the eight other words mentioned above.

Themes were then presented to each participant for verification. A bound-typed diagram to illustrate themes of risk factors, as seen in Figure 1, was drafted and presented to participants for verification. An interrater judgment by two psychologists (forensic and clinical), eight ‘grassroots’ deradicalization practitioners, and a psychometrician was conducted for validating themes (content validity) and diagram.

5. Results

The results of this study show that there are 18 factors grouped into the following domains: Motivation, Ideology, and Capability. Six risk factors could be located within the higher order Motivation domain, six into Ideology, and six into Capability. The six Motivation factors are Economic, Justice, Situational, Social, Superiority, and Actualization Motives. The six Ideology risk factors include Values, Beliefs about Purpose, Attitudes, Militancy, Understandings on Philosophy, and Layers in Ideological Groups. The six Capability risk factors include skills in Intelligence, Information and Communication Technology (ICT), M and E, Military, Language, and Social Domination Skills. These 18 risks and need factors and the three higher order domains are presented in a circular model, Figure 1 describes risk factors in this study. Moreover, participants suggested that fulfilment of the needs of offenders in 18 factors would lead to risk reduction which reduces the chance of offenders being visited by counterterrorism practitioners.
The study suggests the contentment of needs of terrorist offenders to fill the gap between risk assessment and risk reduction.

**Domain: Motivation.**

The domain of Motivation covers all motives driving the act of terrorism. Motivation is symbolized as “Heart”, meaning interests, will, drives, feelings of discontentment, and emotions.

**Risk factor 1: Economic Motives.**
Economic Motives is defined as motives of terrorism associated with economic and biological needs. The scope of this risk factor includes the following concepts or terms: unfulfillment of basic biological needs, financial motives, poverty, employment problems, perceived economic discrepancies, and economic dissatisfaction.

**Risk factor 2: Justice Motives.**
Justice Motives is defined as motives of terrorism associated with the needs for search for justice. The scope of this risk factor includes revenge and rejection of law, social rules, and regulations.

**Risk factor 3: Situational Motives.**
Situational Motives is defined as motives of terrorism associated with the needs for safety and security. The scope of this risk factor includes the following concepts or terms: unfulfillment of safety needs, insecurity, stress, individual crisis leading to grievance, criminal history, personal vulnerability, emotional instability, personal issues (e.g., family, broken-home, education, immigration, troubled peers, delinquency, adjustments, substance abuse), troubled backgrounds, subjective discrepancy (personal dissatisfactions), and escaping motives (fugitivity).

**Risk factor 4: Social Motives.**
Social Motives is defined as motives of terrorism associated with the needs of social support, sense of belonging, and social identity. The scope of this risk factor includes the following concepts or terms: unfulfillment of social needs, feeling marginalized or lonely, self-confidence issues, attribution of kindship, affiliation preferences, solidarity, social vulnerability, self-identity issues, and online networks.

**Risk factor 5: Superiority Motives.**
Superiority Motives is defined as motives of terrorism associated with the needs for power or reaching a higher position in a social hierarchy. The scope of this risk factor includes the following concepts or terms: unfulfillment of controlling needs, prestige, pride, need for power, seeking for social status, needs to control others, and political motives.
Risk factor 6: Actualization Motives.
Actualization Motives is defined as motives of terrorism associated with the needs to give impact to others. It includes the following concepts or terms: unfulfillment of actualization needs, needs to contribute, outreaching motives, lack of positive involvement in society, lack of positive organizational experience, lack of self-actualization, adventurous motives, curiosity, and needs for existence.

Domain: Ideology.
The domain of Ideology includes religious or spiritual concepts, a system of ideas, commitment, experiences, attitudes, mindsets, and positions constructing legitimacy to acts of terrorism. Ideology is symbolized as “Head”, which explainsjustifications, knowledge, rationalizations, sense of values or definitions of “right or wrong”.

Risk factor 7: Values (Doctrines).
Values are defined as thoughts, concepts, dogmas, doctrines, and ideas which are favorable to violence. This includes the following concepts or terms: violent-related beliefs/doctrines, low sense of spirituality, spiritual immaturity, takfirm, hakimiyyah, intolerance to outer circle, anti-coexistence, anti-establishment, religious radicalism, lack of personal introspection, narrow-mindedness, rigid thinking, black-and-white way of thinking, violence-dominated interpretations of sacred texts, tendencies to choose the most harsh religious practices,undermining bloodshed, rejection of ethics/norms/laws, non-citizenship, behavior, and exclusiveness.

Risk factor 8: Violent Attitudes.
Violent Ideology-Driven Attitudes is defined as attitudes toward outside social groups driven by thoughts, concepts, dogmas, doctrines and ideas which are favorable to violence. The scope of this risk factor includes the following concepts or terms: non-cooperationess to outer circle, aggressions, rejection of contacts/visits and favors from outer circle, anti-social attitudes, and hatred toward the outer circle.

Risk factor 9: Beliefs about Objectives (Targets of Missions).
Beliefs about Objectives is defined as goals or targets in life driven by thoughts, concepts, dogmas, doctrines, and ideas favorable to violence. Their scope includes the following concepts or terms: purpose of life, ultimate goals, violence-related visions, destructive plans, violence-related missions, instrumental goals, targeted victims/perceived enemies, targeted media/equipment, targeted modus operandi/means, violence-related deadlines, and planned actions.

Risk factor 10: Layers in Ideological Groups.
The definition of this risk factor is positions in violent ideological group(s) which describe roles, status, involvement, grades, layers, levels, tasks, and ranks. Its scope includes the following concepts or terms: roles in terrorism, status in terrorism networks, involvement in terrorism networks/criminal offense/military training/local or global conflicts, levels of seniority in terrorism groups, duties/ranks/grades in ideological groups, outreach in terrorism networks, and reputation in ideological groups.

Risk factor 11: Terrorism Militancy.
Militancy is defined as resistance to alter thoughts, concepts, dogmas, doctrines, and ideas which are favorable to violence. Its scope includes the following concepts or terms: devotion to higher figure(s) in terrorism networks, violence-related risk-taking, resistance to positive changes, anti-dialogue/negotiation, and rejection of positive opportunities.

Risk factor 12: Understanding Philosophy and Contexts.
This risk factor is defined as the lack of understandings of religious philosophy and its implementation in various contexts. In Indonesia, this factor means the lack of contextual insights and understandings on 1) Pancasila as the national constitution, 2) Undang-Undang Dasar 1945 as the basic law; 3) Negara Kesatuan Republik Indonesia (NKRI), the official name of the country; and 4) Bhinneka Tunggal Ika as “Unity in Diversity”, the official national motto. These are four fundamental national consensuses set by the founding fathers of Indonesia. The scope of this risk factor includes the limited understandings of religious concepts/teachings, various contexts (time and place) of religious practices, local wisdom, the philosophy of Islam, the spirit of national consensuses of Indonesia, Pancasila, UUD 1945, NKRI, and Bhinneka Tunggal Ika, Indonesian history, anthropology of religions in the world, Islamic history (tarikh Islam) and anthropology, and interpretations of sacred texts. It is also described by lacks ability in conceptual/abstract thinking regarding philosophies of religious values, critical thinking, accepting critiques and feedback, and performing cost-benefit analysis in making decisions.

Domain: Capability.
The aspect of Capability covers skills used in terrorism. Capability is symbolized as “Head” reflecting the fact that these capabilities are things that can be performed by hand or equipment, power, or physical sources.

Risk factor 13: Intelligence Skills.
The definition of this risk factor is skills to acquire, collect, manage, store, retrieve, combine, compare, distribute, build, and use information including complex data, which can be to manage a terrorism activity. Their scope includes skills in data gathering, processing, analysis, interpretation,
and management. The scope also includes skills in Big Data management, disinformation, spying, conditioning, counterintelligence, surveillance, decision making, problem solving, and counter-deradicalization.

**Risk factor 14: Language Skills.**

The definition of this risk factor is skills of listening, reading, speaking, and writing in multiple languages, which can be used to manage a terrorism activity. Their scope includes listening, speaking, writing, reading, translating, journalistic, literacy, and public speaking using multiple languages.

**Risk factor 15: ICT (Information and Communication Technology) Skills.**

This risk factor is defined as skills in using and creating Information and Communication Technology, such as computers, programs, cyberspace, Information Technology (IT) and Dark Web, which can be used to manage a terrorism activity. Their scope includes skills in Information Technology (IT), social engineering, computer coding and decoding, digital forensic, cyber defense and security, ICT security-analysis, cryptography, crypto analysis, cyber-virus making, steganography and watermarking, web development, cyber-attack/hacking, Big Data development, and drone-making.

**Risk factor 16: Military Skills.**

Military Skills are skills operated in physical fighting, battlefield, warfare, and conflicts, which can be used to manage a terrorism activity. Their scope includes knowledge and experience in physical toughness, field engineering, defense, martial arts, battlefield, war tactics, psychological warfare, weapon shooting, Chemical Biological Radioactive Nuclear and Explosive (C.B.R.N.E) such as poison-making, bombs designing, survival, war strategies, weapon technology/ guerilla, disabling security, trap making (e.g., booby trap), and military training.

**Risk factor 17: Social Domination Skills.**

This risk factor is defined as skills of influencing others, human-approaching, social networking, financing, propaganda, and micro expressions (understanding people). Their scope also lies in skills in directing, coordinating, guiding, and even brainwashing people.

**Risk factor 18: M and E (Mechanical and Electrical) Skills.**

This risk factor is defined as skills of using and creating technical, mechanical and electrical equipment, which can be used for managing a terrorism activity. Their scope is described by aeromechanical, weapon/gun- assembling, auto-mechanical, aerodynamic, mechatronic, electromechanical, and bomb-crafting skills.

**6. Discussion**

There remains a deficiency of empirical research into terrorism related to structured examination of psychological risk factors for terrorism [1]. These risk factors are beneficial to formulate risk assessments to terrorist offenders and design interventions/responsivity [1]. Monahan [12] suggests that criminogenic psychological risk factors for terrorism must be identified prior to create terrorism risk assessment/instruments. In Indonesia, assessments to terrorist offenders and foreign terrorist fighters are still unclear. Current instruments for CVE in the country are basically focusing on religious radical extremism, not the risk and needs factors of offenders after being detained [13].

This study examines psychological criminogenic risk factors and needs (“Risk-Need”) of terrorist offenders in Indonesia, inspired by Risk-Need-Responsivity (RNR) Model by psychologists, Bonta, and Hoge [14] which emphasizes the identification of Risk and Need of criminal offenders prior to Responsivity or rehabilitation. This study can help in setting up future parameters of effective terrorism rehabilitation in Indonesia. Moreover, the study can be replicated in any countries to understand the risk/need factors in other contexts.

This study identifies 18 individual risk/need factors ideology-based terrorist offenders in Indonesia that are grouped into three higher order domains: Motivation, Ideology, and Capability. Participants described Motivation as the “heart” which means interests, wills, drives, feelings of discontentment, unfulfillment of certain needs, and emotions favorable to support terrorism. Moreover, Ideology domain or the “head” encompasses religious and spiritual concepts, a system of ideas, knowledge, the definitions of “right or wrong”, and a sense of values determining attitudes. The last domain, Capability or the “hand” contains all abilities supporting terrorism which can be hard and soft skills.

The results of this study reveal 18 individual risk factors and needs of ideology-based terrorist offenders in which the first six are classified as Motivation, the second six as Ideology, and the rest as Capability. The first six risk factors are: 1) Economic, 2) Justice, 3) Situational, 4) Social, 5) Superiority, and 6) Actualization Motives. These risk factors are closely related to motives by Maslow [52] as basic human needs before introduced to any knowledge on religious teachings.

The second six risk factors found in this study are:
7) Doctrines, 8) Targets of Missions, 3) Attitudes, 4) Militancy, 5) Understandings on Philosophy and Contexts, and 6) Layers in Ideological Groups. This supports several scholars’ studies that ideology and belief systems play an important role in causing terrorism including in Indonesia. The findings also support Rokeach’s Belief System Theory which highlights the importance of values/ideology in the study of social attitudes and behavior. In Indonesia, the description of terrorism Ideology of terrorism focuses on violent doctrines which are in contrast with the sacred foundational philosophical values of Indonesia: Pancasila. Pancasila as an abstraction of Indonesian ancient wisdom and philosophy (Pancasila means “Five Fundamental Commandments”) includes Five Principles: 1. Belief in one God, 2. Human Rights, 3. Unity in diversity, 4. Consent and democracy, and 5. Social prosperity; therefore, it has adopted religiosity as its elements. Unfortunately, Pancasila still cannot satisfy the mind of Indonesian Islamic violent extremists as it does not literally state the implementation of sharia laws; hence, the Indonesian government and its people are perceived as secular (deserve attacks) according to them.

The last six risk factors identified in this study are skills in: 1) Intelligence, 2) ICT, 3) M and E, 4) Military, 5) Language, and 6) Social Domination. In this finding, the study shows its uniqueness by listing the terror offenders’ possible technical skills in details, such as auto-mechanical, coding, digital forensic, drone-making, hacking, financing, and CBRNE skills. The results included the previous findings of terrorism capabilities.

Due to the limited research on terrorism risk factors locally and internationally, a baseline study can be regarded as a reference for future development of terrorism risk assessments. Published information about terrorism risk assessment and their items were limited and risk/need assessments of terrorist offenders within security contexts usually are not released or available for public review, publication, or comparison; therefore, this study becomes considerably important. Furthermore, as the study uses qualitative approach, the results provide a rich information about targeted risk/need factors of terrorists which can accordingly become the future objectives for rehabilitation or deradicalization in Indonesia. Referring to Meehl’s view about risk factors, the risk factors explored in this baseline study were dynamic or clinical rather than actuarial (“statistical”). The results provide guidance for assessors to consider risk and need factors in each domain of offenders and to help assess progress (by comparing risk/need factors before and after rehabilitation). If quantification is considered beneficial then further research needs to be conducted to elucidate the quantification of MIC risk assessment.

Taking place in Indonesia as the largest Muslim population before and during pandemic, the study sharply prioritizes both online and offline risk factors. It focuses its attention only on relevant risk factors in the domains of Motivation, Ideology, and Capability. The study eliminates several variables when examining terrorists, such as marital status, gender, and social class.

The study facilitated open discussion among cross-sectional Indonesian professionals in terrorism and gave these participants the opportunity to provide opinions on sensitive issue such as Islamic radicism. The qualitative approach of this study gives each risk factor an equal value/quality, which means there is no risk factor that is more/less important than others. Practical advantages, this will help Indonesian practitioners coordinate and eradicate ‘sectoral-eyes’ in counterterrorism efforts because everyone’s role (e.g., psychologists, lawyers, clerics, police, social workers, military officers) is important to modify the behaviors of terrorists.

The results of this study are in line with findings in the previous study by Sukabdi which involve terrorist offenders as participants. When asked about the differences/changes before and after deradicalization, the offenders in the study explained that the following issues were critical that needed intervention in the beginning of their arrestment: Lack of positive purpose of life, Lack of self-observation, Limited critical thinking ability, Lack of independence against radical networks, Incomplete achievement in society, and Lack of life improvement. All these risk factors have been included comprehensively in the current study. Moreover, using humanistic psychology approach and viewing each offender as an active agent capable of generating a ‘free will’ and independent responses to a variety of stimulations/environments, the study excludes external risk factors such as recruitment style and terrorism networks/affiliations. Therefore, the study takes no account of networks-grouping issues such as ‘ISIS vs non-ISIS’.

Qualitative method used in this study helps in generating ‘systematic broader, clearer, and operational’ risk factors which gather together and combine all issues identified by various scholars in terrorism field. Borum in his Four-Stage Model of the Terrorist Mindset, for the 1st example, suggested that Grievance that is transformed into three issues: 1) Perceived injustice (“It’s not fair”), 2) Target attribution with external Locus of Control/LoC (“It’s your fault”), and 3) Devaluation of people (“You’re evil”) would facilitate a justification for aggression. The 2nd example, Horgan, hypothesises that these following issues: Values, Dissatisfaction (e.g., social or political),
Vulnerability, Identification with victims (Solidarity and Needs for justice), Social motives, and Targets are crucial in the psychology of terrorist offenders. The 3rd example, McGilloway, Ghosh, and Bhui [3], highlight individual’s Vulnerabilities as the variable that increases the exposure to radicalisation. The 4th example, Monahan [3], states that Ideologies, Affiliations, Grievances, and Emotions are individual variables that need assessment in the offenders. The 5th example, Pressman and Flockton [95] set Beliefs and Attitudes, Context and Intent, History and Capability, Commitment and Motivation, and Protective Factors as categories of items in Violent Extremism Risk Assessment (VERA). The last example, Silke [96], underlines Social identity, Marginalisation, Discrimination, Perceived injustice or Revenge, Status and personal rewards as elements determining why certain individuals involve in terrorism.

A further research on the most appropriate skill set when assessing each risk/need factors is accordingly necessary. Further studies in other regions with different systems, replicating the current research, are also needed to examine the generalizability of certain risk factors. Economic and Justice Motives for example, is crucial in the context of Indonesia where poverty, malnutrition, and inequality are still issues faced by the country [97,101]. Moreover, further studies of MIC risk factors in the countries where an ideology other than Islam (i.e., Buddhism, Communism, Judaism, Supremacism) is used to justify violence is recommended. These studies may capture different risk factors for each type of terrorism mentioned earlier by Victoroff [32].

7. Conclusions

This study recognizes eighteen individual risk and need factors of ideology-based type of offenders. The eighteen risk and need factors are clustered into three higher domains: Motivation, Ideology, and Capability. Motivation is the interests, wills, drives, feelings of discontentment, unfulfillment, certain needs, and emotions favorable to support terrorism. Ideology is religious and spiritual concepts, a systematic of ideas, knowledge, the definitions of “right or wrong”, and a sense of values determining attitudes to support terrorism. Capability consists of abilities which may support terror actions.

The results of this study disclose eighteen individual risk and need factors of offenders. The first six factors are in Motivation, the second six are in Ideology, and the last six are in Capability. The first six risk factors are: 1) Economic, 2) Justice, 3) Situational, 4) Social, 5) Superiority, and 6) Actualization Motives. The second six risk factors are: 7) Doctrines, 8) Targets of Missions, 3) Attitudes, 4) Military, 5) Language, and 6) Social Domination.

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ARTICLE
The Left-liberal Skew of Western Media

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ABSTRACT
We gathered survey data on journalists’ political views in 17 Western countries. We then matched these data to outcomes from national elections, and constructed metrics of journalists’ relative preference for different political parties. Compared to the general population of voters, journalists prefer parties that have more left-wing positions overall (r’s -0.47 to -0.53, depending on the metric used), and that are associated with certain ideologies, namely environmentalism, feminism, social liberalism, socialism, and support for the European Union. We used Bayesian model averaging to assess the validity of the predictors in multivariate models. We found that, of the ideology tags in our dataset, ‘conservative’ (negative), ‘nationalist’ (negative) and ‘green’ (positive) were the most consistent predictors with nontrivial effect sizes. We also computed estimates of the skew of journalists’ political views in different countries. Overall, our results indicate that the Western media has a left-liberal skew.

1. Introduction
It is widely claimed that the media leans left or is biased against non-left-wing views [1-4]. However, such claims have been disputed by others [5,6]. One significant limitation of the empirical literature on media bias is that it is narrowly focused on the United States [7], a problem with quantitative media research generally [8]. Hence we attempted to quantify the political skew of the Western media as a whole.

How can one study political bias in the media? We are aware of three main approaches. First, one can analyze who owns or funds the media. This approach is based on the assumption that owners exert some kind of influence over the outlets they own. Interestingly, both far-left and far-right commentators have cited analyses of media owners in support of their views. Far-left commentators have highlighted that the media are owned almost entirely by the wealthy, who tend to hold conservative views on economic issues [9]. Hence if owners do influence the outlets they own, it would tend to be in the direction of maintaining the status quo, which is assumed to benefit them. On the far right, commentators have taken a similar approach, except that instead of emphasising owners’ wealth, they have focussed on their ethnicity. In particular, it has been claimed that Jewish-owned media tend to support specific interests such as defending Israel, or trying to undermine nationalism in Western countries [10,11].
A second approach to studying media bias is to analyze the content of the media itself \[^{[12,13]}\]. Traditionally, this involved reading through media output, and then manually coding it as supporting one ideology or another. Because this method relies on the subjective judgment of coders \[^{[9]}\], it is open to the criticism that those coders themselves might be biased, or that there are second-order effects whereby sources seem right-wing while being neutral, due to most other media being left-wing \[^{[7]}\]. In addition to these criticisms, manual coding is extremely labor intensive and is therefore difficult to implement in practice. To get around these issues, studies have increasingly relied on machine learning analysis of media content \[^{[14]}\].

One study ranked media outlets from liberal to conservative by comparing the number of times they cited various think tanks or policy groups to the number of times those groups were cited by Democrat versus Republican members of the US Congress. Media outlets that tended to cite groups more often cited by Democrats were classified as more liberal, whereas those that tended to cite groups more often cited by Republicans were classified as more conservative \[^{[15]}\]. In a related study, Gentzkow and Shapiro (2010) \[^{[16]}\] trained algorithms to identify the phrases that most differentiated Democrat versus Republican members of Congress, and then classified newspapers based on how frequently they used the phrases that were typical of Democrats versus Republicans. Their rank ordering of major US news outlets was similar to the one obtained by Groseclose and Milyo (2005) \[^{[15]}\], and they found that most news outlets had a left-wing tilt. (Interestingly, they also found that ownership of media outlets was of comparatively minor importance).

Another way to utilise machine learning is to train algorithms to code media content based on text cues which may be incomprehensible to humans but that do show predictive validity \[^{[17]}\]. This necessitates having a text corpus with known (or assumed) political leanings, which can be obtained either by recruiting humans to evaluate a subset of the data, or by relying on sources with known (or assumed) positions, such as politicians who have given speeches. For example, Budak et al. (2016) \[^{[17]}\] used human judges to rate a subset of their data, and then evaluated the remaining, very large dataset using complex, trained models. Their method yielded a similar ranking of US news outlets to those that have been reported in previous studies.

A third approach to studying media bias is to analyse data on media personnel themselves \[^{[18]}\]. Media organizations employ a variety of workers, the most important of whom are journalists and editors, with journalists comprising the lion’s share of the workforce. As a matter of fact, our initial analysis of surveys of media personnel indicated that journalists constitute the vast majority of respondents to such surveys. As a consequence, any survey-based approach would have to focus on journalists, while analysing data on, say, editors only if it happened to be reported.

We took the approach of analysing media personnel themselves because we found that it was relatively easy to track down surveys from a variety of countries, including many that had received little previous attention, especially in the English language literature (e.g. Polish and Scandinavian surveys). Note that it would be much more difficult to analyse data from many countries using content analysis because the relevant models do not easily generalize across languages. Hence our approach can be considered particularly useful in this regard. We decided to focus our attention solely on Western countries because language barriers would have been prohibitive for non-Western countries.

A number of previous cross-national surveys of journalists have been carried out. Yet these did not generally include questions about voting behavior (or vote intentions), but only self-placement on a left-right scale. We consider this unsatisfactory in the present context because of the reference group effect, namely that journalists might rate themselves in comparison to others within their profession and extended network, rather than with respect to the general population. Furthermore, previous research has shown that self-placement is only moderately correlated with more complex measures of political views, such as factors derived from many multiple-choice questions \[^{[19-23]}\]. To avoid this issue, we decided to collect data on journalists’ voting behaviour or vote intentions.

1.1 How Media Bias Works: The Distortion Model

Before proceeding to the methods section, it is worth outlining the main causal model for the relationship between journalists’ political views and media bias, which we consider to be the distortion model \[^{[7]}\]. The model can be divided into three parts, which we will discuss in turn. First, survey evidence indicates that journalists have considerable leeway as to which stories they write and how they write them. By and large, journalists seek out stories in the information stream that surrounds them, which happens to include a lot of other journalists. Here political leanings are relevant, given that journalists are presumably more interested in stories that cast a favourable light on persons, parties or organizations with which they identify, as well as stories that cast a negative
light on persons, parties or organisations to which they are opposed. This kind of bias has been termed gatekeeping or selectivity in the previous literature [22]. Although note that a recent US study found no evidence of a liberal bias in which news stories political journalists choose to cover [9] 1.

Second, journalists have many options concerning which sources to seek out when writing a story. Suppose a local university has just rolled out a new policy. If a particular journalist happens to support the new policy, he can choose to seek out only or predominantly sources that are likely to speak in its favor. Because there are always many relevant sources that could be sought out, some kind of selection has to be made. And one would expect this selection to produce a list of sources that comports with the journalist’s own preferences. On some occasions, journalists may seek out particularly ill-informed members of the opposing side of the story, so as to make that side “look bad”. When writing a story about the local university’s new policy, the journalist could seek out a well-spoken professor who supports it, and a dissenting individual who is known to make particularly incoherent arguments.

Third, journalists have to make decisions about which words or images to use when writing a story [23]. How should a given individual be introduced or labeled? Consider Charles Murray, the author of the controversial book The Bell Curve, which is about intelligence and social inequality in the United States. Should he be described as ‘far-right’, ‘controversial’, or a ‘pseudoscientist’? These are certainly labels that have been used for him. Or maybe he should be described as ‘a scholar associated with the American Enterprise Institute’, which emphasizes his political association with the libertarian-leaning think tank, or even as a ‘leading scholar of American inequality’, which emphasizes his intellectual contributions.

Choices over how to describe particular individuals are inevitable when writing about politics, and the distortion model assumes that journalists’ choice of words reflects their own political preferences. A journalist with left-wing views will tend to see everybody else as comparatively right-wing, while a journalist with right-wing views will tend to see everybody else as comparatively left-wing. This kind of bias has previously been labeled statement bias [22].

Together, the three tendencies outlined above result in a consistent slant of media output in line with the journalist’s political preferences. The model is illustrated in Figure 1. At each stage, some level of political bias enters into the journalistic production process, and that bias accumulates across the stages, resulting in output that becomes progressively closer to the journalists’ own views.

2. Data Collection and Metrics

2.1 Data Collection and Initial Coding

We searched the published literature for surveys of journalists that included questions on voting behavior or vote intentions. This search yielded comparatively few relevant articles, and we therefore turned to works such as dissertations, reports, and newspaper articles. The reports were often written in the local language (e.g. French in France), and were often published by journalist associations or media organizations. In other cases, newspapers themselves conducted surveys and reported the results in their own pages, almost invariably in the local language.

To collect these data, we were assisted by a diverse team of international research assistants who could read the local language, and knew where to look or whom to ask. When we were unable to find anyone, we wrote to local journalist associations and relevant academics asking if they knew of any relevant sources. In general, our search was multi-faceted: Google Scholar, Google advanced search, asking friends from relevant countries, asking for assistance on social media platforms such as Twitter and Reddit, etc.

The resulting sources were saved to a publicly accessible repository at the Open Science Framework (https://osf.io/6uvnu/). Online sources were archived to prevent link rot or deletion of primary source material. Data from the sources were coded using a standardized format, and entered into a publicly accessible spreadsheet at Google Drive. Usually some adjustments to the data were needed, and these were done in a dedicated sheet within the spreadsheet so that everything was fully documented. The most common adjustment concerns respondents who declined to say or didn’t know whom they had voted for. In particular, these individuals were ignored, and the definite preferences were normalized to 100% by dividing by the sum of the definite preferences. An example of this is shown in Table 1.

This method effectively assumes that people who didn’t contribute data would have voted in the same relative proportions as their counterparts who did. In reality, this assumption is probably somewhat inaccurate, and one

1 The authors ran a correspondence experiment in which they emailed a large number of journalists on behalf of a fictitious candidate for the state legislature, and asked each one whether she would be able to cover the candidate. They found that journalists were not significantly more likely to cover the candidate when he was described as conservative, as compared to when he was described as liberal. However, we do not believe this provides compelling evidence for the authors’ conclusions because it could be ideologically advantageous for journalists to cover a candidate from the opposing party. For example, it might allow them to misrepresent the candidate or to cast his views in an unfavourable light.
A range of 72 to 1,338. The mean/median proportion of journalists who provided party preference data was 0.75/0.79 (sd = 0.17). On average, there was a mean/median of 2.5/1.0 surveys by country.

2.2 Relative Preference Metrics

To estimate journalists’ political preferences, one needs a reference population to serve as an anchor. Since we had decided to focus on journalists’ voting behaviour or vote intentions, we utilised data from the national election that was nearest in time to the relevant journalist survey. In a few cases, we averaged two elections equidistant in time (details are given in the Calculations sheet). Political skew was defined as any deviation of journalists’ preferences from those of the general voting population. Of course, such skew could be in either one of two directions: journalists might prefer a given party more or less than the general voting population.

Because of disagreement about the optimal metric to use (the authors could not even agree), we decided on a pluralistic approach, and employed several metrics. First, we used the delta %point ($\delta$) metric. This is the simplest metric, and is defined as journalist% - general%, i.e., the number of %points that journalists vote more for a given party than the general population. When negative, it means that journalists vote for the party less than the general population. The metric could be seen as problematic for smaller parties because it fails to capture the relative aspect of party support. If journalists are 5 ppts more likely to vote for a particular party, it may matter whether that party enjoys 5% or 50% support in the general population.

The sample size of the surveys included in our analysis had a mean/median of 542/500, with a range from 89 to 1640. The effective sample size (number with definite preference given) had a mean/median of 418/408 with

Table 1. Calculation example for vote normalization. Polish journalists for 2005 parliament election (1st round).

| Party                                | % of journalists | % of votes cast |
|--------------------------------------|-----------------|-----------------|
| Social Democracy of Poland           | 3               | 3.33            |
| Democratic Left Alliance             | 4               | 4.44            |
| Democratic Party                     | 9               | 10              |
| Civic Platform                       | 60              | 66.67           |
| Polish People’s Party                | 0               | 0               |
| Law and Justice                      | 11              | 12.22           |
| Self-Defence of the Republic of Poland | 0            | 0               |
| League of Polish Families            | 0               | 0               |
| Real Politics Union                  | 3               | 3.33            |
| Total voted                          | 90              | 100             |
| Abstained                            | 10              |                 |

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is that they are undefined when journalists have zero support for a given party in our samples. This problem arises due to sampling error for parties that have low levels of support among journalists (assuming that journalists never have exactly 0% support for a party). Thus, excluding the undefined data points would result in a data bias because of the excluded data’s relation to the outcome of interest (i.e., there would be nonrandom missing data). We therefore conducted a simulation study to investigate the best way to adjust the data. We found that a local regression model based on sample size performed well. We imputed the best guess of support for parties where 0% was observed with a given sample size. After that, the support for other parties was adjusted downwards slightly so that the sum was again 100%. This essentially mimics a Bayesian approach with a weak prior. See the supplementary materials for more details about this procedure.

2.3 Party Data

### Table 2. Example calculations of preference metrics.

| Journalist% | General% | $d$ | RR  | OR  | log10RR | log10OR |
|-------------|----------|-----|-----|-----|---------|---------|
| 45          | 20       | 25  | 2.25| 3.27| 0.35    | 0.51    |
| 35          | 10       | 25  | 3.50| 4.85| 0.54    | 0.69    |
| 15          | 10       | 5   | 1.50| 1.59| 0.18    | 0.20    |
| 10          | 10       | 0   | 1   | 1   | 0       | 0       |
| 10          | 15       | -5  | 0.67| 0.63| -0.18   | -0.20   |
| 10          | 35       | -25 | 0.29| 0.21| -0.54   | -0.69   |
| 20          | 45       | -25 | 0.44| 0.31| -0.35   | -0.51   |

None of the metrics are entirely satisfactory. For instance, while the log10RR takes into account the relative support without nonlinearity problems, it does not give any information about the overall importance of the difference. If a party has 1% support among the general population and 3% support among journalists, this would constitute a threefold difference in attitudes, but would not be very important in terms of overall voting behavior. The $d$ metric would clearly show this, however, while providing less information about the differences in relative support. A difference in party support of 80% versus 90% might not be taken to have the same importance as a difference of 1% versus 11%, say, even though both differences have a $d$-value of 10% points. We decided to report detailed results from the $d$ and log10RR metrics in the main text. Results for the other metrics can be found in our supplementary materials.

One particular problem with the log transformed metrics is that they are undefined when journalists have zero support for a given party in our samples. This problem arises due to sampling error for parties that have low levels of support among journalists (assuming that journalists never have exactly 0% support for a party). Thus, excluding the undefined data points would result in a data bias because of the excluded data’s relation to the outcome of interest (i.e., there would be nonrandom missing data). We therefore conducted a simulation study to investigate the best way to adjust the data. We found that a local regression model based on sample size performed well. We imputed the best guess of support for parties where 0% was observed with a given sample size. After that, the support for other parties was adjusted downwards slightly so that the sum was again 100%. This essentially mimics a Bayesian approach with a weak prior. See the supplementary materials for more details about this procedure.

Figure 2. Infobox on Wikipedia for Sweden Democrats (Sverigedemokraterna, https://en.wikipedia.org/wiki/
Table 3. Political party ideology tag tabulation. LW = left-wing, RW = right-wing.

| Rank | Tag                | Proportion | Count | Rank | Tag                | Proportion | Count |
|------|--------------------|------------|-------|------|--------------------|------------|-------|
| 1    | conservative       | 0.45       | 86    | 12   | RW_population      | 0.13       | 25    |
| 2    | liberalism         | 0.40       | 76    | 13   | democratic_socialism| 0.12       | 22    |
| 3    | EU_positive        | 0.23       | 43    | 14   | national_conservatism | 0.11       | 21    |
| 4    | EU_skeptic         | 0.21       | 41    | 15   | agrarianism        | 0.08       | 15    |
| 5    | populism           | 0.18       | 35    | 16   | feminism           | 0.07       | 13    |
| 6    | green              | 0.18       | 34    | 17   | communism          | 0.07       | 13    |
| 7    | nationalism        | 0.17       | 33    | 18   | libertarianism      | 0.05       | 10    |
| 8    | social_democracy   | 0.17       | 32    | 19   | centrism           | 0.04       | 7     |
| 9    | social_liberalism  | 0.17       | 32    | 20   | direct_democracy   | 0.04       | 7     |
| 10   | christian          | 0.15       | 28    | 21   | LW_population      | 0.03       | 5     |
| 11   | socialism           | 0.14       | 27    |      |                    |            |       |

Sweden_Democrats).

By combining data from surveys of journalists and general elections, we computed metrics of relative support for political parties. There were 151 parties with at least one relative preference datapoint in our sample. By itself, however, this information is not informative. One also needs some information about the parties themselves. Instead of relying on the authors’ judgment of party political ideology and relative placement (which could of course be biased), we relied on the English language Wikipedia as an external source. English Wikipedia has pages for all of the parties in our dataset (n = 197), and provides ideological and relative placement data in a semi-structured format called the infobox. We retrieved and processed this information automatically using a web scraper. Political left-right position data were available for 93% of the parties (n = 184), and political ideology data for 97% (n = 191). Missing data were mostly confined to small or defunct parties. Figure 2 shows a part of the infobox for a party (Sweden Democrats, from Sweden). The information of interest is given by Ideology and Political position. For political ideology, we cleaned the references (i.e., the numbers in brackets) and any explanatory text in parentheses (not shown in example). This results in a tag set for every party. The tags across pages were not entirely standardized, so to reduce the number of tags to a more manageable quantity, we recoded and merged a few of them. The details of this procedure are given in the supplementary materials. Table 3 shows the frequency distribution for the ideology tags.

For political positions, nearly all the descriptors refer to a relative position between far-left and far-right, sometimes with two descriptors being used (e.g. “right-wing to far-right”). In almost every case, we removed any other descriptions given, and converted the political position into a numerical scale from -3 to 3, reflecting the 7 possible descriptors used. The descriptors were then averaged for each party. For parties with two listed, this resulted in half integer values (e.g. 2.5 for “right to far right”). Figure 3 shows the distribution of political positions in the data. The mean/median position was 0.05 with a standard deviation of 1.40 and skew of 0.01. Thus, it was nearly perfectly symmetrical despite having a bimodal shape. This seems to indicate a relative lack of bias in Wikipedia’s positioning of parties, since bias would have presumably skewed the distribution in a particular direction.

2.4 Independent Party Ratings

To check the validity of Wikipedia’s party ratings, we recruited 25 individuals to rate all 197 parties in our dataset on a 7-point scale from “far-left” to “far-right” (including non-integer values, if desired). These individuals were recruited online via Facebook groups for people interested in politics, and via participant referral (snowballing). Each individual received approximately 300 DKK (45 USD) for participating. Raters were told that they could use any approach they wanted, except that they should not use Wikipedia, and should not simply copy-and-paste ratings from another source, including another participant. They were not told the purpose of the study. 23 out of 25 raters were Danish (the remaining two were Dutch and Portuguese, respectively); 60% were male; and they were aged between 17 and 30. The raters were
Recruited by a research assistant who was also not aware of the study’s purpose.

There was no evidence of cheating on the part of raters. No two raters were suspiciously similar in ratings (maximum $r = .91$, 2nd highest, $r = .80$, mean $= .63$), suggesting they had not copied one another. And none of the raters gave ratings that were suspiciously similar to Wikipedia’s positions (maximum $r = .85$, mean $r = .66$), suggesting that they had complied with our instruction not to use Wikipedia. Measures of internal consistency for the average party ratings were good, although two of the raters gave ratings that were only weakly correlated with the others’ ($r’s .15$ and .36). The intraclass correlation was $=.54$ (.61 without two poor raters), Chronbach’s alpha was $.97$ (.97 without two poor raters), and the median correlation was .61 (.63 without two poor raters). Clustering the ratings by similarity did not reveal any obvious effects of age, sex or Danish nationality.

Overall, the mean party ratings were strongly correlated with Wikipedia’s ratings: across 183 parties for which Wikipedia ratings were available, $r = .86$, shown in Figure 4.3

One interesting difference between Wikipedia’s ratings and participants’ ratings is that participants labelled parties as “far-right” less often than Wikipedia. (Note the relative lack of parties in the top right of the plot). This may be due to our raters being slightly more right-wing than average, Wikipedia having a left-wing bias, or raters interpreting “far-right” as referring to Neo-Nazi parties, of which there are none in our dataset (their voter support was too low, and they were outlawed in some countries). Overall, however, the average participant ratings strongly corroborate the measures derived from Wikipedia.

2.5 Data Exclusion Rules

We excluded parties that received less than 2% in the general election. The journalist samples are generally too small to calculate accurate preference metrics for such parties, and they would therefore mostly contribute noise to the results. They are also of little practical importance since they enjoy no real political power in the countries where they are found.4 This resulted in 19 excluded cases (of 151, 13%). As a robustness test, we analyzed the effect omission is unlikely to have affected our results.

4 Most countries have election thresholds at higher values than 2%, with an average of about 4% across the countries in our dataset.

Figure 3. Political positions of parties according to English Wikipedia position data.

3 The discrepancy with the number of parties in the Wikipedia data, 184, is that we mistakenly omitted one party from the list of parties given to the raters, and therefore have no rating data for this party (Pirate Party Germany). However, since the party in question is relatively minor, this
The simplest way to analyze the data is to examine the left-right position of parties, and the relative preferences of journalists for or against those parties. We report results based on both participants’ party ratings and Wikipedia’s party ratings. Our two preferred metrics, $d$ and $\log_{10}RR$, are shown in Figures 5-8.

The figures indicate that there is a relatively strong relationship, whereby journalists tend to prefer parties with more left-wing positions overall. For Wikipedia’s ratings: $r = -.47$ for $d$, $r = -.53$ for $\log_{10}RR$. And for participants’ ratings: $r = -.50$ for $d$, $r = -.53$ for $\log_{10}RR$. In fact, the relationship was about equal in strength across all of our metrics and rating sources. For Wikipedia’s ratings: $r = -.48$ for RR, $r = -.40$ for OR, and $r = -.53$ for $\log_{10}OR$. And for participants’ ratings: $r = -.53$ for RR, $r = -.47$ for OR, and $r = -.54$ for $\log_{10}OR$. The relationship is somewhat nonlinear when using the Wikipedia data: the maximum differential in support is for center-left parties, rather than for far-left parties. A likelihood ratio test of a linear vs. nonlinear (spline) model supports this conclusion for the $\log_{10}RR$ metric and is borderline-significant for the $d$ metric: $d$ adj. $R^2$ 21.3% vs. 24.4%, $p = 0.052$; $\log_{10}RR$: 27.4% vs. 31.7%, $p = .016$). The nonlinearity was not evident in the rater data (model comparisons $p$'s .48 and .17, for $d$ and $\log_{10}RR$ metrics, respectively).

3. Analyses

There are a number of ways to analyze the dataset we assembled. The analyses reported here are to some degree exploratory because it was not clear how best to analyze the data before we gathered it, and we were therefore unable to pre-register our analyses [27].

To avoid giving more weight to parties for which we had multiple surveys, all voting data were averaged at the party level. In addition, parties were weighted so that each country had the same overall weight, at least initially (i.e. each party was assigned a weight of $1/n$, where $n$ is the number of parties with data for that country). This prevented countries with more parties from exerting a disproportionate influence on the results.5

3.1 Left-right Position

5 The election threshold (minimum vote% needed to gain any seat) has an impact on the number of parties that make it into a country’s parliament. Since countries differ with respect to this threshold, some countries have a lot more unique, smaller parties, and others fewer and larger ones. The USA and the Netherlands represent the extreme positions on this since the USA has a de facto 2 party system and the Netherlands has no election threshold with 150 seats (i.e., one needs 0.67% of the vote to gain a seat).
Figures 5-8. Party political position and journalists’ relative preference for the d and log10RR metrics. Orange line = OLS fit, blue line = LOESS fit.
3.2 Ideology Tags

Next, we turn to our ideology tags. Here we begin by taking a univariate approach, calculating an average (central tendency) for each tag. We chose the weighted mean and median as our estimators. Figure 9 shows the results for the logRR metric.

Compared to the general voting population, journalists prefer parties that are associated with the following ideologies: green parties/environmentalism, feminism, support for the European Union, socialism. Conversely, journalists are less likely than the general voting population to support parties associated with the following ideologies: national conservatism, libertarianism, populism, nationalism and conservatism. Tables S1 and S2 in the Supplementary Information give the numerical results.

In some cases, the magnitude of journalists’ relative preferences was quite large. Across the two versions of RR, the general population votes about 6.1 times more for national conservative parties as journalists do, whereas journalists vote about 3.0 times more for green parties. For robustness, we analysed the data using unweighted versions as well as using the log10OR metric. However, doing so made relatively little difference to the results. The correlations across combinations of metrics were very strong with a mean/median correlation of \( r = .89/.91 \).

3.3 Multivariate Analyses

Having seen that both left-right position and most ideology tags are associated with journalists’ relative preferences, we now tackle the more complicated question of how to combine the predictors into a single model. In particular, we have only about 120 cases with complete data, but 22 interrelated predictors. The predictors consist of the 21 tags and the overall political position, of which we have two versions. We also have three different outcome variables. Given these limitations, we did not expect to get useful results from OLS regression.

In macroeconomics, a similar issue arises when using country-level data. Consequently, some economists have begun using a Bayesian model averaging (BMA) approach. This method involves fitting all the possible regressions (where possible, otherwise sampling 1000s of them), and seeing which predictors tend to be included in the best models, and how strong they are in these models. It is conceptually similar to best subset selection, and is a form of meta-analysis. We fit BMA to our dataset using the BMS package. We used the default settings for the package, and analyzed the complete set of models since this was computationally feasible. In our case, there were 21-22 predictors yielding 2-4 million models to evaluate (runtime on a laptop was a few minutes for each set). We did this for each of the three outcome metrics (d, log10RR, and log10OR), and each of the two sets of political position data (Wikipedia and rater-based). We left out the populism tag because of its redundancy with respect to the directional populism tags (right-wing populism and left-wing populism).

Because the output from these analyses is rather lengthy, we have confined it to the supplementary materials (see Tables S3-S6). In an ideal world, there would be variables that are clearly important in all models, and variables that are not. In addition, the same variables would be important no matter which outcome metric, or which version of the political position data, we use. Unfortunately, our output tables showed that reality is not quite so clear. For example, in the first meta-analysis (Wikipedia data + d outcome) the ‘conservative’ tag variable was included in 97% of the best models. The effect size was quite large at -9.7 (i.e., journalists’ vote% was 9.7% lower for parties tagged as ‘conservative’, holding the other variables constant). However, when we compared these results to the parallel results based on the rating data, we found that this tag was only included in 85% of the best models, though it still had a sizable beta of -7.7. And when we looked at the results based on log10RR, the same tag was only included in 93% and 66% of the best models (for Wikipedia dating and rating data, respectively). This shows that modelling choices matter for the stability of the results.

For the sake of simplicity, we looked for variables that appeared to be useful across the four meta-analyses corresponding to our preferred specifications (Tables S3-S4). We somewhat arbitrarily defined ‘useful’ variables as those that 1) had a PIP of at least 10%, and 2) had a post mean effect size larger than trivial (d > 1, |log10RR| > 0).

6 The unweighted median is the middle datapoint in a set of numbers ranked by value. If there are an even number of datapoints, the mean of the two middle datapoints is used. The weighted median works the same way, but applies the weights (1/number of parties in that country) to increase or decrease the relative size of each datapoint along the ranking, and then chooses the middle one as usual.

7 The outlier in the figure for the green tag is Youth Party – European Greens, from Slovenia (https://en.wikipedia.org/wiki/Youth_Party_%E2%80%93_European_Greens), which obtained anomalously low support among journalists in a sample of 300 journalists from 2009. As a matter of fact, the result is probably due to sampling error, given that the party received only 2.6% among the general population and 0.3% among the journalists. This is a difference of only a few individuals in the sample, and illustrates the extreme sampling error problem with the RR and OR metrics when the level of support for a party is low.

8 This method is also called Bayesian averaging of classical estimates (BACE), where classical refers to the frequentist approach in the source regressions.

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the general population of voters. The strength of this skew varies from -0.17 to -0.96, with a mean/SD of -0.58/0.26. If instead we look at the rater data, we see a left-bias for 16 out of 17 countries, with a mean/SD of -0.52/0.26. The only notable difference is that Slovenia has a very slight right-bias in the rater data, probably related to the issue with small parties we discussed earlier. It can also be observed that countries differ substantially in their mean political position, and that these differences make intuitive sense. Poland stands out in our dataset as particularly right-wing (0.98 and 1.11, respectively) and indeed, it is generally known as a conservative, Catholic country. On the other hand, the general populations in the Netherlands and Germany are rated as left-of-center in our dataset. This is somewhat puzzling for Germany, given that the country has been governed by center-right parties since 2005 (headed by Angela Merkel). Generally speaking, the results in Table 4 should be taken as a first attempt at quantifying the skew of journalists in different countries, and not as something definitive.

### 3.5 Robustness Checks

We have already seen that the tag-based results were fairly robust to the outcome metric and the use of weights > .05, i.e. 10% increase). Given these criteria, the most important variables were: 'conservative' (negative), 'nationalism' (negative), and 'green' (positive). Thus, our multivariate analysis shows that these seem to be the most useful variables that have an appreciable effect size. The conclusion is not necessarily that other variables don’t matter, but just that their effects are difficult to detect with a high degree of confidence in the current dataset.

#### 3.4 Left-right Position by Country

Using the party preference data and the political position of parties, it is possible to calculate the overall political position of the general population in a country, the position of journalists in that country, and the difference between them. The latter may be taken as an overall estimate of the left-right skew of the journalists in a particular country. However, given that some of the data on journalists were obtained from ad hoc samples, individual estimates are subject to considerable uncertainty, and should be interpreted with caution. Table 4 shows the values for the countries with available data, ordered by the magnitude of the skew.

> Based on the Wikipedia data, it can be observed that, in 16 out of 16 countries, journalists are more left-wing than the general population of voters. The strength of this skew varies from -0.17 to -0.96, with a mean/SD of -0.58/0.26. If instead we look at the rater data, we see a left-bias for 16 out of 17 countries, with a mean/SD of -0.52/0.26. The only notable difference is that Slovenia has a very slight right-bias in the rater data, probably related to the issue with small parties we discussed earlier. It can also be observed that countries differ substantially in their mean political position, and that these differences make intuitive sense. Poland stands out in our dataset as particularly right-wing (0.98 and 1.11, respectively) and indeed, it is generally known as a conservative, Catholic country. On the other hand, the general populations in the Netherlands and Germany are rated as left-of-center in our dataset. This is somewhat puzzling for Germany, given that the country has been governed by center-right parties since 2005 (headed by Angela Merkel). Generally speaking, the results in Table 4 should be taken as a first attempt at quantifying the skew of journalists in different countries, and not as something definitive.

#### 3.5 Robustness Checks

We have already seen that the tag-based results were fairly robust to the outcome metric and the use of weights

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> Figure 9. Journalists’ relative support for parties by political ideology. Red diamonds correspond to the weighted median for each tag in the log10 RR metric.
very low levels of support in the general population on the grounds that these data would be afflicted by substantial sampling error. We examined the effect of trying different thresholds for exclusion, including none. Figure 10 shows the results across method choices. Here we see that changing the threshold from 0 to 10% leads to an increase in the effect size, presumably due to removal of cases with large errors. At a threshold of 10% mark, only 59 cases out of the original 151 remain in the analysis. Thus our decision to only remove parties with less than 2% support seems to be a rather conservative choice that tended to weaken the results slightly.

Third, we tried dropping data from older sources. While we sought to identify the newest possible sources, especially surveys from the last 20 years, we sometimes had to rely on older sources. The publication dates of the surveys included in our analysis range from 1997 to 2017, but most of the data were of more recent origin: mean/SD = 2008/5.6. Did the inclusion of older data affect our results? If we drop the data from before 2005, the sample size changes from 132 to 100, and the results change from -.50 to -.55 (rating data, d metric), -.55 to -.58 (rating, log10RR), -.47 to -.50 (Wikipedia, d), and -.54 to -.57 (cf. Section 3.2). However, there are other decisions that might have influenced the results. (Note that we also compiled data on the political attitudes of other media personnel. These are provided in Tables S7-S8 in the Supplementary Information.)

First, recall that we used a pseudo-Bayesian approach to move the 0 values away from exact zero, so as to ensure that our RR values would be meaningful. (Observed values of 0 result in relative ratios (RR’s) of 0, and thus infinite values for the log transformation.) We re-ran the main left-right analysis using the unadjusted values. This is straightforward for the $d$ metric, and yielded very similar results, as expected (for the ratings data: $r = -.50$ before and after; for Wikipedia data, $r = -.47$ before and after). For the log10RR metric, this alternative specification yielded a small increase in effect sizes, due to the removal of many datapoints corresponding to right-wing parties with observed 0% support among journalists (n dropped from 132 to 120). The observed changes were quite minor, however: the log10RR left-right correlations changed from -.53 to -.55 for the Wikipedia data, and from -.53 to -.56 for the ratings data.

Second, recall that we excluded data for parties with very low levels of support in the general population on the grounds that these data would be afflicted by substantial sampling error. We examined the effect of trying different thresholds for exclusion, including none. Figure 10 shows the results across method choices.

Here we see that changing the threshold from 0 to 10% leads to an increase in the effect size, presumably due to removal of cases with large errors. At a threshold of 10% mark, only 59 cases out of the original 151 remain in the analysis. Thus our decision to only remove parties with less than 2% support seems to be a rather conservative choice that tended to weaken the results slightly.

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| Country | Wikipedia-based political position | Rater-based political position |
|---------|----------------------------------|--------------------------------|
|         | Journalist mean | General pop. mean | Bias wikipedia | Journalist mean | General pop. mean | Bias |
| 1       | Austria         | -0.36  | 0.62  | -0.97  | Austria         | -0.77  | 0.33  | -1.10  |
| 2       | France          | -0.73  | 0.20  | -0.93  | France          | -1.08  | -0.27 | -0.81  |
| 3       | Switzerland     | -0.22  | 0.66  | -0.89  | Switzerland     | -0.06  | 0.63  | -0.69  |
| 4       | Denmark         | -0.75  | 0.10  | -0.86  | Denmark         | -0.69  | 0.01  | -0.69  |
| 5       | Ireland         | -0.66  | 0.18  | -0.84  | Ireland         | -0.85  | -0.26 | -0.58  |
| 6       | Sweden          | -0.65  | 0.06  | -0.71  | Sweden          | -0.85  | -0.18 | -0.67  |
| 7       | Norway          | -0.37  | 0.18  | -0.56  | Norway          | -0.21  | 0.25  | -0.46  |
| 8       | United Kingdom  | -0.31  | 0.23  | -0.54  | United Kingdom  | 0.01   | 0.52  | -0.51  |
| 9       | Poland          | 0.48   | 0.98  | -0.50  | Poland          | 0.70   | 1.11  | -0.42  |
| 10      | Finland         | -0.26  | 0.24  | -0.50  | Finland         | -0.64  | -0.03 | -0.61  |
| 11      | Belgium         | -0.46  | 0.02  | -0.48  | Belgium         | -0.71  | -0.14 | -0.57  |
| 12      | Netherlands     | -0.59  | -0.14 | -0.45  | Netherlands     | -0.71  | -0.21 | -0.50  |
| 13      | Australia       | -0.11  | 0.24  | -0.35  | Australia       | -0.17  | 0.25  | -0.42  |
| 14      | Canada          | -0.30  | 0.01  | -0.31  | Canada          | 0.28   | 0.38  | -0.10  |
| 15      | Germany         | -0.59  | -0.38 | -0.21  | Germany         | -0.69  | -0.29 | -0.40  |
| 16      | Slovenia        | 0.19   | 0.35  | -0.17  | Slovenia        | -0.06  | -0.09 | 0.03   |

USA 0.51 0.88 -0.37

| Country | Journalist mean | General pop. mean | Bias |
|---------|-----------------|-------------------|------|
| Austria | -0.77           | 0.33              | -1.10|
| France  | -1.08           | -0.27             | -0.81|
| Switzerland | -0.06 | 0.63 | -0.69 |
| Denmark | -0.69           | 0.01              | -0.69|
| Ireland | -0.85           | -0.26             | -0.58|
| Sweden  | -0.85           | -0.18             | -0.67|
| Norway  | -0.21           | 0.25              | -0.46|
| United Kingdom | 0.01 | 0.52 | -0.51 |
| Poland  | 0.70            | 1.11              | -0.42|
| Finland | -0.64           | -0.03             | -0.61|
| Belgium | -0.71           | -0.14             | -0.57|
| Netherlands | -0.71 | -0.21 | -0.50 |
| Australia | -0.17 | 0.25 | -0.42|
| Canada  | 0.28            | 0.38              | -0.10|
| Germany | -0.69           | -0.29             | -0.40|
| Slovenia| -0.06           | -0.09             | 0.03 |
Of course, our analyses have a number of important limitations. First, not all the surveys of journalists had large sample sizes. Ideally, one would want a large, representative sample of journalists from each country. However, we often had to rely on ad hoc samples of journalists, (e.g. a survey from a particular region or city, or one based on a limited number of outlets.) The sample sizes varied from small (<100) to large (>1,000). The smaller surveys may of course yield uncertain estimates of journalists' preference for or against a given party. When we analyzed the effect of inclusion threshold, an indirect way of evaluating the effects of sampling error, we found that increasing the threshold did not weaken the results.

Second, many of the surveys were somewhat older than we would have liked. We attempted to find samples collected within the last 22 years (1998 onward) to reduce drift in party ideology between the time of the survey and the time party data were added Wikipedia. We only included older surveys when we were unable to find newer ones, based on the assumption that some slightly older data is preferable to no data at all for a given country. In addition, we did not find a substantial effect of sample age in our analyses.

Third, despite collecting data for multiple years, there were still some Western countries for which we were

4. Discussion and Conclusions

We have attempted to quantify the political skew of Western media by comparing survey data on journalists’ voting behaviour to national election results. Our results showed that journalists lean left overall (Section 3.1), and that they are particularly unsupportive of national conservatism, while being particularly supportive of feminism, immigration and the EU (Section 3.2). In multivariate analysis using Bayesian model averaging (Section 3.3), we found that three ideology tags were consistent predictors: conservatism (negative), nationalism (negative), and green (positive). The findings we observed were generally robust to alternative specifications and sensitivity checks (Section 3.5). We believe they are unlikely to change much upon collection of additional data. Indeed, we wrote most of the analysis code early on in the process of data collection, and monitored the results as new data came in. The findings presented here are quite similar to those observed when data on only a few countries were available.

Of course, our analyses have a number of important limitations. First, not all the surveys of journalists had large sample sizes. Ideally, one would want a large, representative sample of journalists from each country. However, we often had to rely on ad hoc samples of journalists, (e.g. a survey from a particular region or city, or one based on a limited number of outlets.) The sample sizes varied from small (<100) to large (>1,000). The smaller surveys may of course yield uncertain estimates of journalists’ preference for or against a given party. When we analyzed the effect of inclusion threshold, an indirect way of evaluating the effects of sampling error, we found that increasing the threshold did not weaken the results.

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Third, despite collecting data for multiple years, there were still some Western countries for which we were
unable to obtain any relevant survey data. Unfortunately, these were not randomly located, but rather concentrated in southern and eastern Europe. The Southern European countries (Greece, Italy, Spain) were center stage in both the Eurozone debt crisis and the European migrant crisis, while the eastern European countries (Hungary, Czech Republic) have featured prominently in the news due to their opposition to accepting migrants. Hence it would be particularly interesting to assess the political skew of journalists in these countries. And indeed, it is possible that the political skew we detected would have been lower if data from more countries had been available. We hope that the present study will inspire further research on journalists’ voting behavior, and reveal data sources that we missed.

Fourth, voting patterns reflect voters’ political preferences, but they are by no means a perfect gauge of such preferences. Here we were able to study several aspects of journalists’ political attitudes indirectly through reported voting behaviour and vote intentions, some dimensions of their political attitudes were not covered at all, making it difficult to say precisely which way journalists lean on the relevant issues.

4.1 Journalists and Academics

Notwithstanding the limitations outlined above, we believe the empirical results we have presented are relevant to understanding the general flow of information within society. To explain why, it is necessary to expand our discussion to the political leanings of academics. Like journalists, academics mostly produce words for a living. Whereas journalists write news articles about current events, academics write reports about current research. Over the last few years, there has been a surge of interest in the political leanings of academics. The results from this literature mirror those seen for journalists, but generally reveal even larger skews towards left-wing parties and political attitudes. For example, Langbert (2018) found that the ratio of Democrat to Republican professors was 17.4:1 in History, 43.8:1 in Sociology and 133:1 in Anthropology.

The effects of political skews in journalism and academia may exert synergistic effects insofar as many news stories relate to findings from new studies published by academics. As a result, the process we described in the introduction (Figure 1) may lead to biased coverage of new research findings. One would expect journalists to preferentially report findings that comport with their own political views, and to interview sources who they suspect will give a favourable interpretation of the importance or validity of the findings. This tendency may interact with the scientific process itself, given that findings reported in the media receive more attention from scientists and tend to get cited more. The academic performance of authors whose work is selected for coverage (quantified by means of citation indexes) will increase, and they will be likely to receive more funding for that line of research. This gives the authors an incentive to produce more research in the same vein. The process we have just outlined is illustrated in the flowchart shown in Figure 11.

It is important to mention that the potential impact of political bias is only statistical. Despite being left-leaning, the media and academia obviously produce many stories and research findings that are not “friendly” to left-wing causes. However, it is plausible that they produce fewer of these stories and findings than they would do in the absence of the observed political skew. This model is not a conspiracy theory because it does not postulate any secret coordination between large numbers of actors in different areas.

4.2 Increasing Media Bias

Several studies have documented an increase in the left-liberal skew of Western media in recent decades. But what factors may have given rise to such an increase, if it has in fact occurred? Shaffer and Doherty (2017) argue that the increase in political bias in the media is attributable to deep-rooted economic factors. They show that media personnel increasingly work in coastal areas which are left-wing. According to their calculations based on the U.S. Bureau of Labor Statistics employment data, the percentage of newspaper and internet-publishing workers working in a county where Democrats won increased from 61% in 2008 to 72% in 2016. Furthermore, the percentage of these individuals who worked in a country that was won by more than 30% points increased from 32% to 51%. Their results are even starker for internet media personnel: 90% of such individuals worked in a county won by Clinton, and 75% worked in a country where she won by more than 30% points. The reason for the increasing urbanization of journalists seems to be the expansion of national media at the expense of local media, which is presumably tied at least in part to the decline in advertising revenues for newspapers.

9 Note that there has been at least one case of large-scale secret collaboration, namely Journolist (Calderone, 2009). Ezra Klein (the former editor of Vox) ran a secret discussion forum (a Google Group) for several hundred left-leaning “bloggers, political reporters, magazine writers, policy wonks and academics”. The individuals on this list sometimes worked together on pieces that later appeared in the news, and even plotted to collectively kill stories they considered damaging to their political goals (Strong, 2010).
4.3 Proposals for Reducing Political Bias

Proposals for increasing political diversity among academics have focused on raising awareness and creating a more hospitable environment for dissidents. We are not aware of any general attempts to increase political diversity among journalists, presumably because people prefer to choose from among an assortment of media outlets, each with a relatively obvious slant. One exception is the proposal mentioned by Groseclose (2012). Specifically, the Minneapolis Star Tribune ran an experiment where they hired a self-identified conservative to increase viewpoint diversity in their newsroom. As explained by Lambert (2007),

When the tinny tinkle of “Joy to the World, the Lord Is Come” begins playing on the cell phone, everyone in range in the Star Tribune newsroom knows who’s getting a call. It is Katherine Kersten, the paper’s unapologetically religious and fiercely conservative metro columnist.

Since May 2005, the Star Tribune has been engaged in what its top editor freely describes as “an experiment.” The test has Katherine Kersten, a fifty-five-year-old former banker, and think-tank denizen, now an opinion writer, playing the role of an alien element injected into a tradition-bound newspaper culture.

Long battered by conservative critics as the “Red Star” for its alleged knee-jerk liberalism ... the Star Tribune decided it had to answer. For the last twenty months, Kersten has been an one-woman solution, applying a decidedly different, and perhaps revolutionary, face to the role of big-city reporter and metro columnist.

The presence of a single self-identified conservative in the newsroom means that anyone with a story that conservatives might prefer to see in print had a designated go-to person. Although this cannot by itself counteract the overall slant of a newsroom, it can at least ensure that every important “conservative” story has a chance of being told. Depending on how hiring usually works, this kind of low level affirmative action (keep at least one right-winger in the newsroom at left-wing newspapers, and vice versa at right-wing newspapers) might be a fruitful option for newspapers to consider.

Rather than trying to alter the ideological composition of the newsroom, one could attempt to forestall biases that may arise during the journalistic production process itself. In science, many such proposals have been made, and some have been partially implemented (e.g., registered reports). For example, one way bias distorts science is through what is termed researcher degrees of freedom, i.e., researchers can analyze their data in many different ways, and then only report the analyses that produced results favourable to their hypothesis. Those results are then published, while the results from the alternative analyses, which yielded null or perhaps even negative results, remain unpublished. Because of the low evidentiary standards in social science, one can almost always find something in a given dataset that could be construed as supporting a particular hypothesis. When the hypothesis under consideration has some relevance to public policy, as is often the case, this tendency may give rise to a general slant in the research findings.

Policies aiming to reduce bias in the journalistic

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10 We acknowledge that a similar version of this chart was originally created by J.P. de Ruiter.
11 The reader can see this for himself by playing with the interactive p-hacking simulator at https://fivethirtyeight.com/features/science-isnt-broken/.
production process have already been implemented in certain countries. In the US, for example, the equal-time rule was implemented as early as 1934 ([49] Miller, 2013, p. 359). This rule specifies that radio and TV stations must provide air time to opposing political candidates who request it. Of course, a detailed discussion how to counteract media bias is beyond the scope of this paper.

Supplementary Material and Acknowledgments

Supplementary materials including tables, code, high quality figures and data can be found at https://osf.io/6uvnu/.

We would like to thank numerous people who helped us gather data for the present study. Some of those who should have been mentioned by name declined due to fear of political retaliation by journalists, academics or both, underlining some of the points made in this article.

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ARTICLE
Relationship between Sexual Fantasy, Sexual Communication, Personality Traits and Sexual Satisfaction in Married Individuals

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ABSTRACT
The study aimed to understand the relationship between sexual fantasy, sexual communication, personality traits and sexual satisfaction in married individuals. Sexual fantasy as a variable has seldom been studied in the Indian context. The importance of sexual fantasies has been noted by therapists and researchers. Studying various aspects of sexual functioning in married life including, sexual communication and sexual satisfaction and personality traits would be beneficial. A cross sectional design with a total sample of 100 married individuals was considered. Tools were administered as online forms. Parametric and Non-parametric tests were used to find the correlation between Sexual fantasy and sexual satisfaction, sexual communication and sexual satisfaction and personality traits and sexual satisfaction. Results indicated that sexual fantasy and sexual satisfaction have a negative correlation, sexual communication and sexual satisfaction have a positive correlation and personality traits and sexual satisfaction also have a positive correlation. This study can be used to develop modules that might aid in marital and sex therapy. It may be useful in identifying any difficulties or issues which may help in providing appropriate timely intervention.

1. Introduction

Indian culture and societal standards are immensely varied. Similar variation can be seen when sex is the topic of discussion. Sexual attitudes and relations are diverse and are deeply rooted in religion and customs. To speak of ironies, India played a very significant role in understanding the act of sex as a science and coincidently harbors taboos about the same. Considering the social stigma and sociocultural expectations, the most common attitude towards sex is of silence.

Sexual fantasies have seldom been spoken about, especially in a country like India. Sexual fantasies though universal by nature, are theoretically elusive and even taboo in many cultures. Sexual fantasy can be defined as mental images or thoughts that are sexual by nature and can enhance or influence one’s sexual experience. Sexual fantasizing often includes activities that one cannot achieve in real life. There are many factors that can affect one’s fantasizing, leading to understanding one’s basic need for sex. A healthy relationship often has a component of sexual fantasies, to achieve pleasure. Many fantasies are not played out, but some find it liberating when it’s

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played out in role-play. It is imperative to understand the role of sexual fantasy in the context of marriage, more importantly in the Indian context. Confusion and contradictions exist in the system of marriage, owing to the shift of traditional values to a more modern one. The traditional marital system gives precedence to the extended family over individual needs, leading to intrusions in intimacy and inability of having a satisfactory sexual life. It has been seen that sexual fantasy is related to multiple variables associated with sexual satisfaction in marriage. Sexual fantasies were reported to increase level of sexual activity and hence, enhance sexual experience. Increase in sexual fantasies leads to an increase in frequency of orgasms, sexual desire, and fewer sexual difficulties. In fact, lack of sexual fantasies can lead to sexual dysfunctions. A study reported that around ninety seven percent of the subjects had indulged in sexual fantasies and that a greater number of sexual fantasies experienced by women resulted in a more positive view about sex and they reportedly had more sexual experiences and partners. It was also seen that women who were more dissatisfied and anxious had more different types of sexual fantasies than women who were more satisfied and less anxious. In a study it was found that less sexual satisfaction leads to increase in frequency of sexual fantasy.

A study done extensively on 38 married couples revealed their sexual fantasy pattern and it was seen that husbands had more sexual fantasies than their wives. Men were more inclined to have fantasies that involved multiple people. For both men and women, their respective partners half the time did not appear in their fantasies. Upon further analysis it was seen that fantasies for men involved a masculine self-image that can satisfy women. Women focused more on the emotional aspects and focused on the person in their fantasies. It has also been seen that women in distressing marriages fantasise more than women who are happily married. Mental imagery could be one of the most common techniques used to handle distressing situations.

Sexual communication is very important for the development and maintenance of sexual satisfaction. However, because of how vulnerable one might be in talking about sexual issues, it is not surprising to see that many couples don’t communicate about sex at all. Disclosure of information related to sexual aspects of one’s relationship like their desires and fears can lead to greater sexual satisfaction. Sexual fantasies are more private than talking about likes and dislikes and hence, are more difficult to discuss. A study suggested that partners who had open communication and were together for a longer period of time had better relationship satisfaction.

Gender differences have also been found in sexual communication. Research study conducted at Temple University with 202 university students who were in monogamous relationships concluded that participants who indulged in open sexual communication showed an increase in sexual as well as relationship satisfaction. More importantly, sexual satisfaction was more significantly correlated with open sexual communication. Open sexual communication has seen to be important for men in the beginning of the relationship and not of much worth as it progresses an one-year mark. Whereas for women, sexual communication is important for relationship satisfaction after an one-year mark. This could be because men start giving importance to other aspects of the relationship as it progresses, whereas the opposite is true for women.

The amount and content of information revealed by the individual depends on the relational negotiation of rules one follows. The perceived privacy of the information is seen as one of the reasons one might not reveal sexual desires or issues. In a study it was found that the topics of conversation in young adults about sex included content of distrust, understanding and being afraid to talk to the partner. Since sexual fantasies are private by nature, the disclosure of fantasies may leave one feeling vulnerable. Hence, these researchers hypothesised that disclosure of one’s fantasies can wither increase sexual rewards or lead to decrease in rewards due to stigma.

In order to understand whether one would disclose their sexual fantasies in a relationship, it is important to look at why one must avoid the topic itself. In a study done 140 women were surveyed and it was found that women refrained from discussing certain topics when they believed that the result would be futile, leading to dissatisfaction in a couple. It has been seen that one might avoid the topic of sexual fantasies in order to protect oneself from vulnerability and because they believe that no result can come from discussing it. Many researchers have also found that one’s unwillingness to reveal sexual fantasy could stem from the lack of closeness in the relationship. Sexual communication increases as the relationship progresses and hence, one might not have built enough rapport to discuss sexual fantasies. The topic of sex in itself is enough to make one feel embarrassed or uncomfortable. It was seen that individuals want their sexuality to be seen as normal by the society and hence don’t reveal their fantasies in the fear of being labelled sexually abnormal.

In a review of literature done by Leitenberg and Henning (1995) it was seen that sexual fantasies were in itself associated with feelings of guilt. Sexual fantasies are
different from self-disclosure about likes or dislikes. The disclosure of sexual fantasies also depends on the rewards of doing so. In a study on 370 participants it was found that more than 81% participants reported that disclosure of sexual fantasies was important for the sexual relationship to last longer, reward of sexual fulfilment being received by discussing. The relationship between sexual fantasies and sexual communication has yet to be explored in depth. Many researchers have only focused on sexual likes and dislikes and hence understanding disclosure of fantasies is important as it can lead to enhancement in intimacy amongst partners.\[1\].

Personality has seldom been studied in relation to sexual fantasies. In a study done by Renaud and Byers (1999) it was seen that sexual fantasies that have positive cognitions (acceptable and pleasant by nature) were more open to experiences and low on neuroticism as opposed to sexual fantasies that had negative cognitions (unacceptable and unpleasant) scored high on neuroticism and obsessiveness.\[16\]. Personality traits such as neuroticism and psychoticism have been found to be related to selective mating in marriage. The personality traits of an individual directly influence partner communication styles. Sexual satisfaction has also been seen as a result of extraversion and introversion in couples. The dimensions of personality like extraversion, neuroticism and psychoticism, have been seen to provide more variance in the personality domain being measured and it has been used in studying many important human behaviour.\[17\].

In a study done in 102 married couples studying at midwestern United States public university, couples whose personalities were compatible and incompatible were studied on their sexual satisfaction levels. It was seen that females did not have a significant difference in sexual satisfaction scores between personality compatible and incompatible couples. Interestingly, there was a significant difference for men with greater sexual satisfaction between compatible and incompatible adults. Females are more likely to be sexually satisfied in marriage when their partners have a similar personality as them. For men there is no difference in sexual satisfaction when the spouses differ on personality factors like extraversion, introversion and neuroticism. But when sexual satisfaction was seen in relation to psychoticism, it was seen that men have greater sexual satisfaction when their partners are the same level in psychoticism.\[17\].

The importance of studying and understanding sexual fantasies has been noted by therapists and researchers. This study will provide new insights to understand sexual fantasies in the context of marriage. It will open doorways in understanding various aspects of sexual functioning in married life including, sexual communication and sexual satisfaction. This is highly relevant in a country like India where topics like sexual fantasies are seldom studied. There is a dire need to educate and facilitate change in this sphere. Development of proper interventions can lead to tackling problems in the sphere of sexual satisfaction in married individuals, ultimately leading to an increase in marriage satisfaction and well-being.

2. Objectives

- To study the relationship between sexual fantasies and sexual satisfaction in married individuals.
- To study the relationship between sexual communication and sexual satisfaction in married individuals.
- To study the relationship between personality traits and sexual satisfaction in married individuals.
- To study the interrelations among sexual fantasies, sexual communication, personality traits and sexual satisfaction in married individuals.

3. Hypothesis

\( \text{H}_01 \): There exists no relationship between sexual fantasies and sexual satisfaction in married individuals.

\( \text{H}_02 \): There exists no relationship between sexual communication and sexual satisfaction in married individuals.

\( \text{H}_03 \): There exists no relationship between personality traits and sexual satisfaction in married individuals.

4. Methodology

4.1 Sample

The sample size consisted of 100 participants (N=100), 50 males and 50 females. The participants consisted of married men and women living in India. The participants were of age range 21-45 from urban setting in Mangalore, Karnataka and other states. Sampling technique employed was convenience sampling and snowball sampling. Exclusion criteria consisted of individuals who are single/unmarried, divorced, or separated and individuals with any diagnosed psychiatric illness were not considered.

4.2 Procedure

The participant Information Sheet and Informed consent was provided to them. After taking the consent, tools were administered, using google forms. The scoring was done and analysis was carried out using Statistical package for Social Sciences (SPSS) vs. 25.0.
4.3 Tools

The tools used were the International Index of Erectile Function – 5, Female Sexual Function Index – 6, Sexual Daydreaming Scale of the Imaginal Process Inventory, Dyadic Sexual Communication Scale, Interpersonal Exchange Model of Sexual Satisfaction Questionnaire, Eysenck Personality Questionnaire Revised.

4.4 Data Analysis

Statistical package for Social Sciences (SPSS) vs. 25.0 was used to do the analysis. P<0.05 was considered as significant. Descriptive statistics like the mean and standard deviation of each group were calculated. Correlation was done by studying Pearson and Spearman Correlation.

5. Results

Table 1 shows descriptive statistics for sexual fantasy, sexual communication, personality traits and sexual satisfaction. The initial data set consisted of 122 participants out of whom 22 responses were removed either because of incomplete responses or not meeting the inclusion and exclusion criteria. Also, participants who have been diagnosed with a mental illness were removed from the data. (N=100).

| Table 1. Descriptive statistics for the Sample including standard deviation and mean |
|---------------------------------|-----------------|
|                                  | Mean            |
| Sexual Fantasy                  | 33.61           |
| Sexual Satisfaction             | 29.97           |
| Sexual Communication            | 42.62           |
| Neuroticism                     | 0.0392          |
| Psychoticism                    | 0.71            |
| Standard deviation              | 10.89           |
| 5.55                            |
| 6.89                            |
| 0.195                           |
| 0.722                           |

*Note: N for the Descriptive Sample = 100

The data were found to be normally distributed (p>0.05). Hence Pearson’s rank correlation (r) analysis was done to find the relationship between sexual satisfaction and sexual communication and sexual fantasy. Table 2 shows Pearson rank correlation coefficients between sexual satisfaction and sexual communication and sexual fantasy. Spearman rank correlation was also used to find the correlation between sexual satisfaction and personality traits including psychoticism, extraversion and neuroticism.

| Table 2. Pearson’s Inter-correlation Matrix among Sexual Satisfaction and Sexual Fantasy and Sexual Communication |
|---------------------------------------------------------------|
| Sexual Satisfaction                                          |
| Sexual Communication                                         | 0.603**          |

A weak negative correlation was found between sexual satisfaction and sexual fantasy (r = -0.151, p<0.01) and a strong positive correlation between sexual satisfaction and sexual communication (0.603, p<0.01).

| Table 3. Spearman’s Inter-correlation Matrix among Sexual Satisfaction and Personality Traits |
|------------------------------------------------------------------------------------------------|
| Psychoticism                               | Neuroticism | Extraversion |
| 0.305**                                   | 0.249**    | 0.00**       |

**p<0.01 (2-tailed)

A weak positive correlation was found between sexual satisfaction and psychoticism (r = 0.305, p<0.01) and neuroticism (r = 0.249, p<0.01). No correlation was found between sexual satisfaction and extraversion.

6. Discussion

The current study aimed to study the relationship between sexual fantasy, sexual communication, personality traits and sexual satisfaction in married individuals. Indian marital relationships are different from western marital relationships. The cultural difference in individualism and collectivism sets stage for each of them. In individualistic cultures, romantic love dominates the conception and satisfaction in marriage. On the other hand, more objective criteria like an appropriate match in religion, education, age and livelihood are considered. The cultural aspects of love and satisfaction are very different when one moves from the west towards the east, where more traditional values of family are considered pivotal. The extended family and the community one belongs to become an important criterion in understanding marriage in India. Satisfaction in the home sphere in India seems to be a result of socioeconomic factors than marriage. Marriage is a strong fulfilling commitment to cultural obligations but comes after practical concerns like money and status. Satisfaction on the personal front also seems to increase, especially for women when they have children, because the identity of a woman in India is often limited to child care.

The collectivistic roots of familial relationships place less value on intimacy and companionship in marriage. The intrusion of the extended family when living in a joint family structure and the absence of privacy leads to difficulties in achieving less sexual satisfaction in marriage. The presence of romance in marriage can often only be seen in music and Bollywood movies. Women ache for the fantasy of a Jodi (pair) and hence are disappointed when they don’t receive the satisfaction of companionship in marriage.

Sexual satisfaction is an important component of a
marital relationship. It evaluates the dimensions involved with one's sexual relationship. In the current study, sexual fantasy, sexual communication and personality traits of extraversion, neuroticism and psychoticism were considered as correlates of sexual satisfaction in a marriage.

The first objective was to study the relationship between sexual fantasy and sexual satisfaction and it can be seen that there is a weak negative correlation ($r = -0.151, p<0.01$) between the two. It has been seen in previous research that disclosure of sexual fantasies can either lead to an increase in overall relationship satisfaction or can lead to loss of role and relationship and stigma. Because of the private nature of one's fantasy, one might not indulge in revealing the content in the context of one's relationship. As can be seen, sexual fantasy decreases when one's sexual satisfaction is more and vice versa. The stigma associated with indulging in fantasy when the cultural context of shame is involved with the general idea of sexual activity is important to understand.

In Indian Hindu marital relationships, the aim is on Dharma (practicing one's religion), Praja (reproduction) and Rati (gratification of sexual pleasure). The duty one feels to one's elders in India is not subsided till one produces a child. Hence the ideas of self-disclosure, interdependence and emotional warmth are not determinants of a satisfactory married life in India. The act of sex is seen as a duty in many ways. Hence the mere imagination of sexual acts could be considered a sin. This can be seen in the low mean scores of sexual fantasy and sexual satisfaction in the population.

The mean age of the sample considered in the study is 31 years and the mean duration of marriage is 8 years. In married couples, a frequent complaint of decrease in quality and quantity of sex can be seen. The reason one might argue for such decline can be because of the increase in age leading to decrease in sexual and physical functioning and because of the familiarity one has towards their partner, where sex becomes a mundane activity. The sharing of sexual fantasies can be seen as one way of increasing sexual activity and passion. It can be seen that couples with more sexual variety are more satisfied with their relationship.

The present research quantified sexual fantasy in the terms of frequency and it can be argued that the increase in sexual satisfaction could lead to a decrease in sexual fantasy since one might not see the need in indulging in fantasy. On the other hand, lower mean scores in sexual fantasy point to the fact that the use of sexual fantasy to increase sexual desire and decrease uninhibitedness is not considered imperative. This could be due to the taboo and silence existing around sexual topics or the avoidance of sexual topics between the partners owing to the private nature of fantasies.

The second objective of the study was to understand the relationship between sexual satisfaction and sexual communication and the results report a positive correlation between the two. Sexual satisfaction influences sexual satisfaction in multiple ways like, increase in one's communication with their partner leads to an increase in sharing of one's sexual likes, dislikes and preferences and more communication can also lead to an increase in intimacy and overall relationship satisfaction. The number of rewards and benefits increases when one indulges in open communication about intimate topics like sex in their relationship. Increase in frequency and quality of sexual communication can be seen to enhance sexual satisfaction in married individuals. It also leads to dyadic adjustment in marital relationships.

The third objective of the study was to understand the relationship between personality traits of extraversion, psychoticism and neuroticism with sexual satisfaction. Psychoticism can be defined as a personality type that likes odd and unfamiliar things, are aggressive to others sensation, risk taking and have narrow impulsivity. Neuroticism can be understood as one's reactivity to stressful situations. Individuals who are high in neuroticism are quick to worry, show anger and fear in a stressful situation. Extraversion can be understood as a personality type that includes individuals who are sociable, crave excitement and can be impulsive in nature.

It was seen that psychoticism and neuroticism have a weak positive relationship with sexual satisfaction. The sample of the study includes individuals who are more psychotic in nature. Hence increase in sexual satisfaction in individuals who are more risk taking and impulsive by nature can be seen. The sample does not contain individuals who are extroverted by nature and hence no relationship between extraversion and sexual satisfaction can be established.

The final objective of the study was to understand sexual fantasy, sexual communication and personality traits in the context of sexual satisfaction in married couples. It can be concluded that there exists a relationship between all and it can be said that good communication leads to better satisfaction and at the same time greater sexual satisfaction leads to a reduction in sexual fantasy. The personality traits add an extra depth to understand the population.

The study provides a holistic understanding of sexual satisfaction by understanding sexual fantasy,
sexual communication and personality traits. It is of dire need as it is hardly a topic of conversation in our society. Creating awareness about sexual satisfaction is important for increasing a couple’s intimacy. It may be of importance for understanding how fantasies could be used to better one’s sexual satisfaction and how open sexual communication can lead to much better understanding of their partner’s needs. The sharing of sexual fantasies and the fulfilment of the fantasy could add sexual variety and experimentation to a relationship. The current study adds to argument by sex therapists that sexual fantasies can help increase sexual arousal and satisfaction. It may help in developing modules that might aid in marital and sex therapy. It may be useful in identifying any difficulties or issues which may help in providing appropriate timely intervention.

7. Conclusions

The research aimed to see if there is a relationship between sexual fantasy, sexual communication, personality traits and sexual satisfaction. Sexual fantasy is seldom spoken about in India. It is imperative to study various correlates of sexual satisfaction to get a holistic understanding of marriage in India. It can be seen that there is a negative correlation between sexual fantasy and sexual satisfaction. There is a positive correlation between sexual communication and personality traits of neuroticism and psychoticism with sexual satisfaction. The personality trait of extraversion could not be elicited in the population studied.

The study provides a holistic understanding of sexual satisfaction by understanding sexual fantasy, sexual communication and personality traits. It is of dire need as it is hardly a topic of conversation in our society. Creating awareness about sexual satisfaction is important for increasing a couple’s intimacy. It may be of importance for understanding how fantasies could be used to better one’s sexual satisfaction and how open sexual communication can lead to much better understanding of their partner’s needs. The sharing of sexual fantasies and the fulfilment of the fantasy could add sexual variety and experimentation to a relationship.

Types of personality has been linked with certain types of sexual dysfunctions. Studying sexual fantasies in relation to personality traits will help identify the areas of therapeutic interventions for these dysfunctions, which will help in promoting healthy sexual expression in a relationship. In couples’ counselling, healthy sexual expression can be promoted and sexuality can be better understood if the link between sexual fantasies and personality is known. Deviant behaviour has also been studied through the lens of personality. Adding the aspect of sexual fantasies can help in early intervention.

The current study adds to argument by sex therapists that sexual fantasies can help increase sexual arousal and satisfaction. It may help in developing modules that might aid in marital and sex therapy. It may be useful in identifying any difficulties or issues which may help in providing appropriate timely intervention. The study may also add to the existing body of literature in this field, and will provide new insights.

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ARTICLE
Assessing the Psychometric Properties of Hindi Version of Relationship Structure (ECR-RS) Scale among Young Adults
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ABSTRACT

Relationship science has proliferated in the last few years. However, most of these studies have remained focused on western culture. An important reason for the lack of relationship studies in the non-western, particularly Indian context, is the lack of culturally validated scales. The present study was aimed at assessing the psychometric properties of the relationship structure (ECR-RS) scale. ECR-RS is a nine-item questionnaire used to measure attachment patterns for different relationships. It has been translated and modified in multiple languages. The study (N = 223, undergraduate students, 32.7% females) evaluated the Hindi version of ECR-RS scale’s psychometric properties for mother, father, close friend, and global attachment. The confirmatory factor analysis supports the presence of the two-factor model as originally theorized in ECR-RS. The findings support the reliability and validity of Hindi ECR-RS. The study contributes methodologically by providing an instrument of attachment styles, which could be a valuable resource for practitioners and researchers in the Indian context.

1. Introduction

Relationship science has proliferated in the last few years [1]. However, a significant limitation of relationship studies is that they have remained focused on the WEIRD (western, educated, industrialized, rich, and democratic) sample [2]. At the same time, the institutions of primary human relationships, i.e., marriage and family, are undergoing intense changes throughout the world. In India, for instance, the large joint-family households are transforming to nuclear couple-centric households [3]; the intimate relationship of spouses are changing with increased educational status and participation of women in the workforce, the divorce rates are gradually increasing, particularly in urban regions [4], and alternate family systems are getting visibility particularly after the decriminalization of section 377 by the supreme court of India, providing relief to the LGBTQA community.

These cultural shifts demand exploration of relationship processes in non-western contexts. Lack of relationship studies from non-western cultures limits our understanding of relationship functioning in these cultures. An important reason for this gap in the literature, especially in the Indian context, is the absence of culturally validated scales and questionnaires which hinders research and practice.

Although many theories exist to understand relationship dynamics [5], attachment theory is probably the most popular among relationship scientists. It is one of the most extensively researched psychological theories in relationship studies [6]. The development of self-report
questionnaires to measure attachment patterns was an important reason that accelerated attachment-related research. Various self-rating scales have emerged to measure attachment behaviors. Ravitz et al. [7] have reviewed 29 self-rating scales of attachment. The self-rating approach to measure attachment styles has gradually shifted the conceptualization of attachment from a categorical concept to a two-dimensional construct.

The items used by Hazan and Shaver [8] grouped attachment patterns into three categories, i.e., secure, anxious/amibivalent, and avoidant. However, discrepancies in the definition of avoidant attachment led Bartholomew [9] to group attachment into four categories - secure, preoccupied, fearful, and dismissing [10]. Fraley and Waller [11], with the help of MAMBAC (Mean above Minus below a Cut) and MAXCOV (Maximum Covariance-Hitmax) analyses, argued that attachment is more of a dimensional construct than a categorical one. Thus the four-category model of attachment evolved into a two-dimensional construct - attachment-related anxiety and attachment-related avoidance, in the Experiences in close relationships (ECR) [12] and Experiences in close relationships - revised (ECR-R) [13].

Researchers and practitioners have extensively used both ECR and ECR-R in various studies. However, there are few limitations to these well-researched attachment scales. Both ECR and ECR-R are large-item questionnaires consisting of 36 items used to measure anxiety and avoidance. The presence of many items makes these scales cumbersome. Moreover, several items in these scales are redundant and repetitive [14].

Recently, Fraley et al. [15] have developed a shorter scale called the Relationship structure (ECR-RS) scale. ECR-RS is a nine-item questionnaire where six items measure avoidance and three items measure anxiety on a 7-point Likert scale. Four of the six items of the avoidance dimension are reverse coded. This questionnaire is separately used to measure attachment in different relationships, such as attachment with mother, father, partner, and close friend. A composite score is expected to reflect the individual’s global attachment style. ECR-RS has shown adequate reliability and validity with a Cronbach’s alpha score greater than .80 for both anxiety and avoidance for different relationships. This scale has been translated into multiple languages, including Danish [16], Portuguese [17], French [18], Chinese [19], Swedish [20], and Turkish [21]. An advantage of ECR-RS over ECR and ECR-R is the fewer items which makes it feasible for different kinds of studies.

The present study aimed to develop and assess the psychometric properties of the Hindi ECR-RS scale. Hindi is one of the most popular languages of communication in India. The availability of the Hindi ECR-RS will be beneficial for therapy and research processes.

2. Methods

2.1 Translation of ECR-RS into Hindi

We began by translating the items of ECR-RS into Hindi. Two forward and one backward translation were done with the help of volunteers who had university-level education and were fluent in English and Hindi. We selected translations with comprehensible items. These were pilot tested on a small sample of thirty individuals to ensure that items were culturally meaningful. We made minor changes based on the suggestions of participants in the pilot study. We then used the final version of ECR-RS for mother, father, and close friend for the data collection.

2.2 Sample

The data were collected from 223 participants (73 females and 150 males) living in different parts of northern India. The sample size was decided based on the requirement for conducting confirmatory factor analysis. Meyers et al. [22] suggest the sample size of 200 as a minimum requirement for conducting factor analysis (p. 468). The Institutional Review Board, Indian Institute of Technology Roorkee, provided ethical approval for data collection. The participants were undergraduate college students whose ages ranged from 16 to 21 years (M=18.27, SD=1.148). Seventy-nine participants (35.4%) came from rural areas, while 144 (64.6%) came from urban areas. Altogether, 172 (77.1%) participants lived in nuclear families, whereas 51 (22.9%) lived in joint family households.

2.3 Procedure

The data were collected through online mode. Undergraduate students of the Indian Institute of Technology Roorkee and Salesian College, Siliguri from north India, were provided with the links for the questionnaire. Participants were briefed about the study and were informed that participation was voluntary. We provided no incentive for participation in the study. The participants had the choice to drop out of the study at any point during the data collection process. To ensure anonymity, we did not collect any information that could identify individual participants. When participants agreed, they...
were provided with the link to the questionnaire. It took approximately 15 minutes to complete the questionnaire.

The instruction provided to the participants for ECR-RS for attachment with mother read, “The following statements are about your thoughts and opinions for your relationship with your mother. Please read the statements and choose the appropriate option to indicate how much you agree or disagree with these statements.” We provided similar instructions for ECR-RS for other relational domains. In these questionnaires, the word mother was replaced by “father” and “close friend.” All items were measured on a 7 point Likert scale with 1 as “strongly disagree” and 7 as “strongly agree.”

3. Results

The data analysis was carried out in SPSS (v. 20) and Amos (v. 20). No missing values were present. We carried out both exploratory and confirmatory factor analysis (EFA and CFA) for each relationship, i.e., mother, father, close friend, and global attachment. The scores of global attachment were derived by averaging the scores for mother, father, and close friend. The factor loadings derived from exploratory factor analysis are presented in Table 1.

EFA was conducted using principal axis factoring and varimax rotation in SPSS. The KMO and Bartlett’s test of sphericity for each relationship indicated that factor analysis was meaningful. In EFA for attachment with mother, two factors emerged, explaining 43.91% variance. For attachment with father also two factors emerged in EFA explaining 55.96% variance. For attachment with close friends, however, a three-factor solution emerged, explaining 66.84% variance. The 5th and 6th items of the avoidance dimension formed a separate factor with an Eigenvalue of 1.07. Both of these items of avoidance dimension are reverse coded, indicating issues with item wordings. We forced the extraction of two factors. This resulted in a two-dimensional model with items of avoidance loading on the first factor and the items of anxiety loading on the second factor, explaining 57.33% variance. Finally, the EFA of global attachment extracted two dimensions explaining 55.97% variance.

We also carried out CFA to confirm that the model was correct. The model fit indices are presented in Table 2. The fit indices for attachment with mother was within acceptable range (CFI = 0.93, RMSEA = 0.07). However, the model fit indices for attachment with father, close friend, and global attachment lacked adequate fit. For these three models, the RMSEA value was greater than 0.1. We modified these three models by drawing co-variances between error terms for items 1 and 4 and items 5 and 6. These modifications led to substantial improvement in the model fit indices (for father CFI = 0.97, RMSEA = 0.06; for close friend CFI = 0.96, RMSEA = 0.08; for global attachment CFI = 0.96, RMSEA = 0.08).

Table 1. The factor loadings of each item of ECR-RS derived from exploratory factor analysis

| Items | Avoidance | Anxiety | Avoidance | Anxiety | Avoidance | Anxiety | Avoidance | Anxiety | Avoidance | Anxiety |
|-------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| 1     | 0.61      | 0.08    | 0.64      | 0.18    | 0.74      | 0.25    | 0.66      | 0.13    |
| 2     | 0.89      | -0.07   | 0.91      | 0.01    | 0.89      | 0.13    | 0.91      | -0.01   |
| 3     | 0.91      | -0.11   | 0.88      | 0.07    | 0.86      | 0.11    | 0.92      | 0.01    |
| 4     | 0.51      | 0.17    | 0.63      | 0.24    | 0.63      | 0.21    | 0.56      | 0.19    |
| 5     | 0.54      | 0.12    | 0.54      | 0.19    | 0.31      | 0.26    | 0.50      | 0.29    |
| 6     | 0.57      | 0.20    | 0.56      | 0.14    | 0.40      | 0.32    | 0.51      | 0.29    |
| 7     | 0.14      | 0.55    | 0.22      | 0.84    | 0.25      | 0.77    | 0.19      | 0.76    |
| 8     | 0.01      | 0.50    | 0.10      | 0.67    | 0.19      | 0.72    | 0.07      | 0.07    |
| 9     | 0.06      | 0.67    | 0.14      | 0.76    | 0.11      | 0.90    | 0.13      | 0.83    |

Notes: Loadings greater than 0.4 are in bold. Items 1 to 6 belonged to avoidance dimension, and items 7 to 9 belong to anxiety dimension. Hindi ECR-RS items are provided in the appendix.

Table 2. The confirmatory factor analysis model fit indices for different measures

| Models                     | \( \chi^2 \) | df | \( \chi^2/df \) | GFI   | TLI   | CFI   | RMSEA |
|----------------------------|-------------|----|----------------|-------|-------|-------|-------|
| ECR-RS Mother              | 56.54       | 26 | 2.27           | 0.94  | 0.93  | 0.95  | 0.07  |
| ECR-RS Father              | 113.14      | 26 | 4.23           | 0.89  | 0.87  | 0.90  | 0.12  |
| ECR-RS Father Modified     | 44.21       | 24 | 1.84           | 0.95  | 0.96  | 0.97  | 0.06  |
| ECR-RS Friend              | 110.01      | 26 | 4.23           | 0.90  | 0.88  | 0.91  | 0.12  |
| ECR-RS Friend Modified     | 62.87       | 24 | 2.62           | 0.94  | 0.94  | 0.96  | 0.08  |
| ECR-RS Global attachment   | 126.05      | 24 | 5.48           | 0.88  | 0.85  | 0.89  | 0.13  |
| ECR-RS Global attachment Modified | 63.10 | 24 | 2.62 | 0.94 | 0.94 | 0.96 | 0.08 |

Notes: All models consisted of 9 items. In modified models, co-variances were drawn between error terms for items 1&4 and items 5 & 6.
Reliability and validity statistics

Table 3 presents the reliability and validity properties of ECR-RS for different relationships. It is evident from the table that for all the dimensions of ECR-RS for attachment with different relationships, Cronbach’s alpha score was adequate (> 0.80) except for anxious attachment with mother (α = 0.59). The average variance extracted (AVE) is popularly used to interpret the convergent validity. The AVE score for the avoidance dimension was slightly lower than 0.5. Again, except for the mother’s anxious attachment, the AVE score for anxiety dimension for all other relationships was within the acceptable range (> 0.5). Because of the low reliability and convergent validity of anxiety with the mother, we assessed the descriptive statistics and inter-item correlation of the three items of this dimension (see Table 4). The findings indicated that the scores of anxiety with mother were skewed, kurtotic, and had low inter-item correlation (> 0.4).

Table 3. The reliability and validity scores

| ECR-RS measures                          | Cronbach’s α | AVE | HTMT |
|------------------------------------------|--------------|-----|------|
| Mother - Avoidance                       | 0.81         | 0.46| 0.22 |
| Mother - Anxiety                         | 0.59         | 0.33|      |
| Father - Avoidance                       | 0.85         | 0.50| 0.39 |
| Father - Anxiety                         | 0.81         | 0.61|      |
| Friend - Avoidance                       | 0.82         | 0.48| 0.52 |
| Friend - Anxiety                         | 0.86         | 0.68|      |
| Global avoidance attachment              | 0.84         | 0.49|      |
| Global anxious attachment                | 0.81         | 0.78| 0.38 |

Note: AVE = Average variance extracted, HTMT = Hetero-trait mono-trait test of correlation; Scores in bold suggest acceptable reliability and validity scores.

Figure 1. Factor loadings for global attachment, F1 = Avoidant attachment; F2 = Anxious attachment

Table 4. Showing the summary of Correlations, Means, Standard deviations, Skewness, and Kurtosis of ECR-RS with each relationship

| Variable         | Avoidance |          | Anxiety |          |
|------------------|-----------|----------|---------|----------|
|                  | Mother    | Father   | Friend  | Global   | Mother   | Father   | Friend  | Global   |
| Avoidance        | .47       | .16      | .77     | .56      | .16      | .04      | .07     | .95      |
| Anxiety          | .04       | .33      | .45     | .52      | .11      | .21      | .28     | .12      |
|                   | .21       | .37      | .33     | .60      | .60      | .67      | .77     |          |
| M                | 2.89      | 3.37     | 2.78    | 3.01     | 1.33     | 1.55     | 2.87    | 1.92     |
| SD               | 1.28      | 1.46     | 1.28    | 0.94     | 0.72     | 1.08     | 1.69    | 0.82     |
| Skewness         | 0.95      | 0.50     | 0.57    | 0.43     | 2.59     | 2.37     | 0.64    | 0.89     |
| Kurtosis         | 0.82      | -0.37    | -0.14   | 0.25     | 6.52     | 5.42     | -0.50   | 0.35     |

Note: M is the mean for an average of avoidance and anxiety dimensions for different relationships; SD is the standard deviation.
We used the hetero-trait mono-trait ratio of correlations (HTMT) method to test the discriminant validity. Henseler et al. [23] suggest that the HTMT method is a better indicator of discriminant validity than traditional methods such as examining cross-loadings. The HTMT value is recommended to be below 0.85 to establish discriminant validity. The HTMT value of ECR-RS for all relationships, including the composite score for global attachment, was acceptable (< 0.85). Thus the discriminant validity was supported.

4. Discussion

The purpose of the current work was to assess the psychometric properties of the Hindi ECR-RS scale. A similar and consistent pattern appeared for ECR-RS for each of the relationships, i.e., mother, father, friend, and global attachment. A two-dimensional structure was supported in the confirmatory factor analysis, corresponding to the model proposed by Fraley et al. [15]. Items on the first factor belonged to avoidance dimension, and items on the second factor belonged to the anxiety dimension. Item 5 and item 6 had the lowest factor loadings on avoidance dimension for all the relationships. Item wordings likely had a role to play in this. The first four items of ECR-RS are reverse coded, but item 5 and item 6 are not. Jaiswal identified problem with item wordings in the Hindi version of experiences in close relationship - revised (ECR-R) scale [24]. It is likely that in the Hindi language, although the implicit meaning of the items may be similar yet because of different wordings, they are rated differently.

The reliability scores for Hindi ECR-RS indicated the scale was reliable, except for the anxiety dimension of ECR-RS for the mother. The anxiety dimension of ECR-RS for mother also showed low convergent validity. One reason for this finding for anxiety with mother could be the cultural meaning and emphasis associated with the mother-child relationship. Kakar [25] and Roland [26] have emphasized that in Indian culture, the relationship with the mother is considered reverent. The mother-child relationship is socially valued as it alleviates the social status of women in the larger joint family and society. It is also argued that the separation-individuation process with attachment figures, particularly with mother, is never fully accomplished. These cultural values associated with the relationship with mother could be a reason for the lack of variance and high skewness and kurtosis of data for this dimension. Additionally, the fewer items could also have influenced the reliability and validity of anxiety with mother. Fraley et al. [15] have pointed out that the anxiety dimension does not contain any item which is reverse coded. Thus social desirability can influence the scores of anxiety. Findings suggest that items for anxiety need modification to measure anxious attachment with mother adequately.

4.1 Implications

The present study has both theoretical and applied implications. The study contributes theoretically by providing cross-cultural support for the ECR-RS scale’s applicability in the Indian context, particularly for the Hindi-speaking population. It also supports the relevance of the adult attachment model [27] in a non-western context, thus, providing cross-cultural support to the tenets of the adult attachment model. ECR-RS can be a valuable resource for both practitioners and academicians alike. The study also has applied implications. The family and couple counselors will benefit from the availability of the Hindi version of ECR-RS, especially those in the understaffed family courts in several states of India. The availability of culturally validated instruments opens new avenues for testing and extending attachment theory propositions in the Indian context.

4.2 Limitations

There are some limitations to the present study. For instance, although the sample size was moderate, a larger sample would have provided a more accurate picture of the population scores. Also, the sample mostly comprised of late teenagers and young adults. A sample consisting of diverse participants would provide richer information about Hindi ECR-RS’s performance in the Indian context. Secondly, using other measurement tools to assess the convergent and discriminant validity would have provided a more comprehensive understanding of ECR-RS’s internal consistency and discriminant validity. Moreover, although ECR-RS is supposed to improve ECR and ECR-R because of fewer items and the ability to measure various relational domains, it measures only the insecure attachment but not the secure attachment.

The future direction would be to test Hindi ECR-RS further using test-retest reliability and the convergent validity using other attachment scales such as Experiences in close relationships. Researchers can also use item response theory to test how each item performs. Future studies can also include items to measure secure attachment and thus overcome an important limitation of attachment questionnaires. The present study had moderate sample size. Future studies can use a larger sample to provide an accurate representation of population scores. We also recommend modifying and adding items
for anxiety dimension to measure attachment-related anxiety accurately.

5. Conclusions

Overall, the present study provides promising results for the Hindi ECR-RS scale and suggests further extension of work. Hindi ECR-RS performed relatively well on the internal consistency, reliability, and validity tests. The future studies can modify the ECR-RS items that had lower loadings on the anxiety and avoidance dimensions and test the influence of item wordings. One could test the performance of Hindi ECR-RS by re-organizing reverse worded items of avoidance dimension into similarly worded items. In conclusion, it is argued that Hindi ECR-RS can be meaningfully used to measure attachment patterns in the Indian context. It will be beneficial in extending research on various relationship domains in Indian culture.

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