

Madness and the Moon: The Lunar Cycle and Psychopathology

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Abstract

Historically, there has been a perceived association between the moon and human biology and behaviour that can be traced back to at least Roman times. The idea that the moon can in some way influence human biology or behaviour is a phenomena that has now come to known as the “Transylvanian effect” in the academic literature. Many mental health professionals continue to hold the belief that lunar cycles can alter human behaviour despite contradictory evidence, but may also be due to personal, ethical, aesthetic, and intuitive ways of knowing. However, studies that have reported positive findings have been shown to be methodologically flawed, inconclusive, or confounded with other variables. Contrary to this belief in a Transylvanian effect are more recent studies refuting any association, relationship, or correlation between lunar cycles and human biology or behaviour. The vast majority of research relating to this phenomenon has been carried out retrospectively utilising secondary data (German J Psychiatry 2006,9:123-127).

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Introduction

The idea that the stars and planets may influence human health and behaviour can be traced as far back as Roman times where the moon was considered to be a supernatural power which played a significant role in phenomena of nature and also on human behaviour. Indeed, the word “lunacy” is derived from Luna the Roman goddess of the moon and reflects the long association of mental disorder with the moon. The possible influence of the lunar cycle over psychological and physiological disturbances in the human being is a phenomenon that has now come to be known as “the Transylvanian Effect” in the academic literature (Mason, 1997).

Raison et al. (1999) traces the historical roots of belief in the power of the full moon to cause disorders of the mind, in-

sanity, and even epilepsy. They point out that belief in the Transylvanian effect could be related to a mechanism of sleep deprivation whereby prior to the advent of modern lighting the moon was a significant source of nocturnal illumination that affected sleep-wake cycle, leading to sleep deprivation around the time of the full moon. This partial sleep deprivation, they argue, would have been significant to induce hypomania in susceptible bipolar patients and seizures in patients with seizure disorders (Raison, et al 1999).

Although this paper is not presented as a systematic review, a literature search was carried out and accessed via CINAHL, Ovid medline, British Nursing Index, Psychinfo, Medline, Swetsnet, Science Direct, and a manual hand search of the reference lists of articles identified from the electronic searches.

Background

A high proportion of health professionals continue to hold the belief that the moon can in some way influence human behaviour. In an unpublished MSc dissertation Angus (1995) reports that 43% of healthcare respondents believed lunar phenomena altered human behaviour. This belief in the Transylvanian effect is particularly strong amongst mental health professionals compared to other healthcare workers, where 81% of mental healthcare professionals reported a belief in behaviour being influenced by lunar cycles.

Snelson (2004) suggests that those working in Accident & Emergency departments were more likely to believe in the lunar effect than community based healthcare professionals, although this based on only on a sample size of 49 people. She also reports that there was no gender difference in the beliefs, nor were the influenced by number of years post qualifying. This suggests that the individual beliefs are held at some level prior to commencement of a healthcare career, although Sneldon (2004) alludes the role of peer pressure, quoting one relatively inexperienced male nurse as "other staff make me aware" despite her statistical findings.

The perpetuation of a belief in the Transylvanian effect amongst mental health care workers may derive from "intuition" as outlined by Benner (1984), or the personal, ethical, and aesthetic interrelated patterns of knowing proposed by Carper (1996)(Owens 2004).

Similarly, this perception can be further substantiated in studies that have found positive correlations between human physiology and the full moon.

Physiology and the full moon

Roman et al. (2004) have examined the prevalence of gastro intestinal (GI) bleeding in relation to the full moon. Carrying out a retrospective analysis of admission notes of 447 consecutively admitted patients to their hospital over a two-year period, they suggest that the difference in the admission rates on the days of a full moon as opposed to other days was statistically significant. This was particularly so amongst males which, they suggest, alludes to a gender difference in the effect of the full moon on GI bleeding (Roman et al., 2004).

Benadis et al. (2004) examined the influence of the full moon on the number of seizures (epileptic and nonepileptic) recorded in their epilepsy monitoring unit. They report no significant difference in the rates of epileptic seizures according to the phase of the moon, although an increase in non epileptic seizures was noted during the full moon.

Other studies have found increased pathophysiology in relation to the lunar cycle in a number of areas including the number of admission to general hospitals (Gardner, 1991) and the number of births in relation to the lunar cycle (Bosanquet 2001), although there are a number of studies that dispute the findings of Bosanquets' study (See for example, Strolego et al., 1991, and Joshi et al., 1998).

The Lunar cycle and psychopathology

Lunar cycle, mental state and quality of life

In what appears to be the only study examining the impact of the moon on quality of life, Barr (2000) reports that the mental health of patients living with the condition of schizophrenia will deteriorate during the time of the full moon. Secondary analysis of a series of face-to-face assessments with 100 patients with varying psychiatric disorders he reports that during the week of the full moon evidence was found to suggest deterioration both in the mental well being and their quality of life. Four separate interviews with each of the participant were conducted over a 30-month period for mental state and quality of life. He reports a significant decrease in mental state, measured by the Brief Psychiatric Rating Scale, in the group of patients with schizophrenia around the full moon. The other group- categorised as "mood disorder" showed no change during the lunar cycle.

Similarly the impact on the Quality of Life of the schizophrenia group appeared to be compromised in relation to "subjective satisfaction with religion" during the full moon phase of the lunar cycle. Again the lunar impact on the mood disordered group was not significant (Barr, 2000)

Lunar cycle and suicide rates

Martin et al. (1992) reviewed 20 studies examining the relationship between suicidal behaviour and change in the lunar cycle. They identified eleven studies that investigated completed suicide and synodic phases of the moon. In a critical review of these papers dating back to 1964, they demonstrate that no significant relationship between the suicides and the lunar cycle was apparent in ten of the eleven studies reviewed. The only study finding a positive correlation (Jones & Jones 1977) compared 928 suicides over a four-year period in Ohio across moon phases. Their data showed a significant relationship between the two variables ($\chi^2=14.39$, $p<0.01$, $\omega = 0.13$). Two attempts to replicate these findings in New Jersey (Garth & Lester, 1978) and Saskatchewan (Martin, 1990) both failed to demonstrate any significant relationship.

Perhaps the most telling of the United States research reviewed by Martin et al (1992) was the study was the study carried out by McMahon (1983). She reviewed all completed suicides in the US over a seven- year period ($n= 185,887$). She found less than plus/ minus 1% variance of suicides across the synodic cycle. She also reports that both the new moon phase and the full moon demonstrated a slight drop in the number of suicide, although she concludes that "differences across the daily lunar cycle" (Martin et al, 1992) were small and showed no obvious cyclic pattern.

Jacobsen, Friedrichsen. Knutsen et al. (1986), in the only European study examined by Martin et al (1992) replicated the negative findings.

In short, Martin and colleagues (1992) conclude that suicide assessment cannot be aided by knowing the phases of the moon.

Table 1. Associations between lunar cycle & psychopathology

Author & Year	Sample Size	Design	Result
Barr (2000)	100	Secondary analysis of case notes	No significant deterioration in either mental state or quality of life in patients with affective disorders. Significant decrease in patients with psychotic illnesses.
McMahon (1983)	185,887	Retrospective analysis of daily suicide rates in USA against phases of the moon	No significant association between suicide rates & lunar cycle
Martin et al. (1992)	N/A	Critical review of twenty studies examining suicide rates and lunar cycle	No relationship between suicide rates and lunar cycle in all but one of the studies. (See below)
Jones & Jones (1977)	928	Retrospective analysis of daily suicide rates in USA against phases of the moon	Significant ($p < 0.01$) association between suicide & lunar cycles.
Biermann et al. (2005)	3054	Retrospective analysis of death dates of completed suicide against the phases of the moon	No significant correlation between suicide dates and moon phase.
Kung & Marzeck (2005)	N/A	Review of psychiatric presentations to Accident & Emergency rooms in relation to lunar phase.	No significant differences in presentation to Accident & Emergency throughout the lunar cycle.

More recently, Biermann et al. (2005) examined the death dates of 3054 suicides in Middle Franconia between 1998 and 2003. They report no significant correlation between lunar phase and completed suicides.

Lunar cycle and violent behaviour

Related to the suicidal spectrum of behaviours, violent behaviours and moon cycles have been the subject of investigation by numerous authors. Nunez et al. (2002), designed a time series of the numbers of daily victims of violent assaults and attacks presenting in an Accident & Emergency setting.

They then compared this temporal series to the daily phases of the moon for the same period. Analysis of their data supported a weak, but non-significant association (-0.012 to $+0.034$) between lunar phases and the frequency of violent behaviour. They conclude that it cannot be predicted that the frequency of victims of aggression that will appear at an accident and emergency department in relation to the lunar cycle (Nunez et al, 2002).

The relationship between the use of seclusion and the lunar cycles was tested by Mason (1997). He argued that if the Transylvanian effect is to be supported then there must be a relationship between the lunar cycles and the use of seclusion in mental health facilities, where the use of seclusion was viewed as the predominant strategy for the control and management of violence and aggression in patients. A retrospective design was utilised to examine the lunar phases in relation to the number of episodes in which seclusion was used as a control and management strategy. The study took place in a "forensic hospital that caters specifically to a dangerous and violent patient population" where there was relatively high levels of violence and use of seclusion. No significant correlation, either on the day of the full moon ($r = 0.21$, $n = 12$, $p < 0.05$) or in the three day period before and after the full moon ($r = 0.14$, $n = 12$, $P = 0.06$) was found in this study.

Owen et al (1998) employed a robust methodology to examine the hypotheses that there was an increased frequency of violent and aggressive behaviour among hospitalised psychiatric clients at the time of the full moon. This study was carried out prospectively in five inpatient psychiatric units across Northern Sydney Area Health Service. Morrison's (1992) hierarchy of violence and aggression was used to rate behaviour. Lunar phases were clearly defined and Poisson regression used to examine relationships between lunar phase and violence. Extraneous temporal variation was also considered and no significant relationship was found between total violence and aggression or level of violence and aggression and any phase of the moon (Owen et al, 1998).

Lunar cycle and psychiatric illness

Juxtaposed to this evidence and the prevailing belief in a Transylvanian effect amongst mental health care workers are studies refuting any association between lunar cycles and abnormal behaviour. Wilkinson et al (1997) examined general practice consultation rates for anxiety and depression and showed that no statistically significant lunar effect was evident. Furthermore, they concluded that the moon had little influence on when individuals consulted their general practitioner with anxiety or depression, (Wilkinson et al, 1997). Similarly, Neale & Colledge (2000) were unable to show significant effect from the full moon on general practice consultations for specific morbidity, in particular mental illness in general, anxiety, or depression. This study was further unable to produce a meaningful model demonstrating a lunar effect for weekends and bank holidays. The rate of consultations with community based psychiatric services over a ten-year period was assessed by Amaddeo et al. (1997). This comprehensive study did not support the theory

that a relationship exists between the lunar cycles and the frequency of contact with community based services.

The belief that more patients present with psychiatric problems at an accident and emergency department when the moon is full, as opposed to the same day of the remaining weeks of the same month when it is not, was examined by Adamou (2001). This study used a case control design and established that the phase of the full moon is not associated with more referrals of patients with psychiatric problems from an accident and emergency department. More recently, Kung & Marzeck (2005) reviewed the psychiatric presentations to hospital via an emergency room over a five-year period. They defined the "full-moon effect" to occur over a three-day period but only from 6:00 p.m. to 6:00 a.m. For example, for the full moon of January 23, 1997, they considered the full-moon effect to occur on the nights of January 22, 23, and 24. A two sample unequal variance t-test showed no significant differences between the number of presentations during a full moon phase (mean 2.3, sd 1.7) and presentations at other times during their investigation (mean 2.32, sd 1.56). They do not however report the values of the t test or the significance levels they were testing against.

Origins of the belief

Throughout this paper we have sought to examine the literature testing the relationship between lunar cycles and psychopathology. One, however, must question where this belief originated and why, in view of the negative empirical evidence it persists.

We noted above that Raison et al. (1999) trace the origins of the myth to antiquity, highlighting that the word lunacy itself derives from Luna, the Roman goddess of the moon. Iosif & Ralton (2005) cite Hippocrates noting "no physician should be entrusted with the treatment of disease who was ignorant of the science of astronomy."

Consequently the notion that lunar cycles influence human behaviour became prevalent and enduring.

It is suggested that the endurance of this myth is as a result of sleep deprivation, originally due to the light from a full moon and latterly from the advent of street lighting, resulting in to mania and elevated mood (Raison et al, 1999). It is suggested that even a single nights sleep disturbance can induce a mania in those predisposed (Wher, 1992, Wright, 1993) with the length of the manic episode being inversely correlated with the number of hours slept (Nowlin-Finch et al, 1994). Nowlin-Finch et al (1994) also report that the longer the patient slept the faster their symptoms resolved.

However, what these studies fail to provide is evidence of causality. That is, that there remains no evidence that the lunar cycle in its self is the causal factor in the onset of mania. Furthermore, these studies relate specifically and solely to mania, thus other psychopathology is not investigated.

Conclusion

The Transylvanian effect on human behaviour is a phenomenon that has come to be accepted as a dominant wisdom among mental health care workers despite consistent evidence to the contrary. This misplaced belief could have implications for practice, for example the unnecessary rostering of extra staff during the phase of the full moon. Furthermore, the belief that the moon in some way influences human behaviour only serves to reinforce negative stereotypes of madness, insanity, and mental disorder. On the other hand, if the existence of a Transylvanian effect is empirically verified then it could lead to potential benefits for patients and staff, whereby a positive correlation could highlight the necessity for higher staff/patient ratios during the peak lunar cycles. Thus the practitioner could have more time for quality interaction with patients with the potential for, a decrease in aggressive incidents, the maintenance of patients' dignity, a more appropriate use of scarce resources, and a more positive ward environment. Nevertheless the majority of published literature, both classic and contemporary, rejects the cause-effect influence of the lunar cycle.

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