

# Perigee Full Moons (“Supermoons”) and its Effect on Emergency Department Behavioral Health Volume and Total Volume

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## ABSTRACT

**Background:** There is conflicting data on the effect of full moons on human physiology. There is even less data concerning the effect of a perigee full moon on emergency department behavioral health visits as well as on total emergency department volume. **Aim of study:** This study aimed to look at the effect of perigee full moons on emergency department behavioral health and overall volume. **Materials and Methods:** Ten Perigee Moon events occurring over a 4 year period were studied in reference to total behavioral health volume as well as total emergency department (ED) volume. The time frame was defined as the day of the supermoon as well as the day before and the day after. These 30 days were compared with 30 random non-full-moon super moon dates. The study design was retrospective with data from an ED information system from a three community hospital emergency departments. **Results:** There was a higher percentage of behavioral health volume as a percent of total volume on supermoon days than on non-supermoon days, in the direction of higher crisis percent volume on supermoon days. This difference was statistically significant ( $p=0.013$ ). The average patient volume for the three sites was higher on supermoon days than on non-supermoon days. However, the difference was not statistically different ( $p=0.06$ ). **Conclusions:** The percent crisis volume was higher on supermoon related days. This difference was statistically significant at  $p=0.013$ . The authors were unable to find comparative literature concerning supermoons to crisis related volume. The literature concerning full moons is contradictory. Our data is consistent with literature that has shown evidence of a relationship of behavioral health related volume to the lunar cycle. The average patient volume for the three sites was higher on supermoon days than on non-supermoon days. However, the difference was not statistically different ( $p=0.06$ ). Our data is consistent with the overall finding from the literature that despite some ED perception, the literature does not appear to support a relationship of the lunar cycle to increased ED volume.

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**INTRODUCTION**

In a unique survey of emergency personnel, 80% of ED nurses and 64% of ED physicians “believed that the moon affects patients.” In fact, 92% of the nurses surveyed believed that a lunar pay differential was justified [1]. The relationship of the moon cycle to total ED volume, psychiatric presentations, seizures, stroke and ACS has been the study of academic research for some time. There is, in fact, some very serious and thoughtful research concerning the effect of the lunar cycle on human physiology. Laboratory data exists to support an effect of the lunar cycle on humans and animal physiology. In reference to both psychiatric (crisis related) volume and total ED volume, the data is contradictory.

The moon’s orbit around the earth is elliptical---it is not a perfect circle. The point at which the moon is farthest away from earth is called the apogee. The point at which the moon is closest to earth is called the perigee. Some perigee moons occur during the time of the full moon. The term “supermoon” has been used to describe perigee moons (new and full). There are various definitions for a supermoon. Timeanddate.com defines a “supermoon” as “a full or new moon that occurs when the moon is less than 360,000 kilometers (ca. 223,694 miles) from the center of the Earth.” A Super Full Moon appears to be about 16% brighter than an average full Moon [2].

There was no literature identified concerning the relationship of supermoons to crisis or total ED volume. The authors of this proposal were unable to find any research articles (PubMed) looking the perigee full moon (Full Moon Super Moon).

**MATERIALS AND METHODS/RESEARCH DESIGN AND METHODS**

Ten Perigee Moon events occurring over a 4 year period were studied in reference to total behavioral health volume as well as total ED volume. The time frame was defined as the day of the supermoon as well as the day before and the day after. These 30 days were compared with 30 random non-full-moon super moon dates. The study design was retrospective with data from an ED information system from a three community hospital emergency departments. Thus, the perigee moon data was compared to behavioral health (volume and total ED volume).

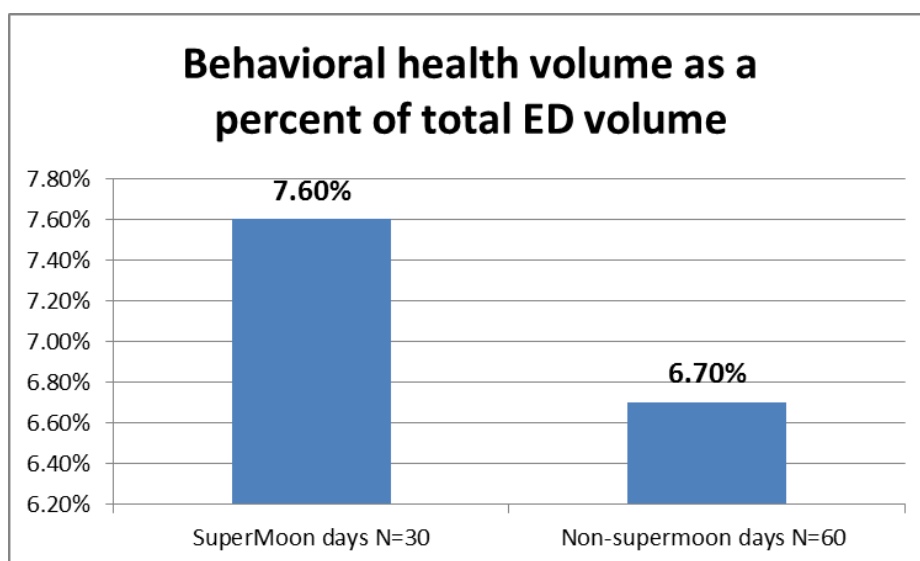
**RESULTS**

**Behavioral health volume**

There was a higher percentage of crisis volume as a percent of total volume on supermoon days than on non-supermoon days, in the direction of higher crisis percent volume on supermoon days. This difference was statistically significant at p=0.013 (Table 1, Figure 1).

**Table 1.** Crisis volume as percent total volume

Behavioral health volume as a percent of total volume			
	Supermoon days N=30	Non-supermoon days N=60	
Crisis percent	0.076	0.067	p=0.013



**Figure 1.** Crisis volume as percent total volume.

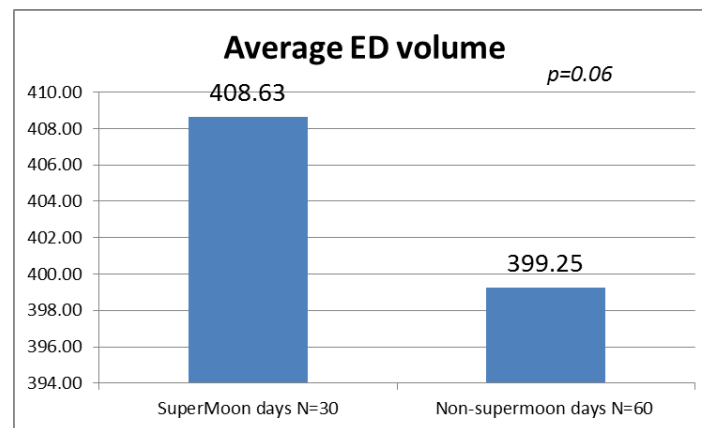
**Total ED volume**

The average patient volume for the three sites was higher

on supermoon days than on non-supermoon days. However, the difference was not statistically different.  $p=0.06$  (Table 2, Figure 2).

**Table 2.** Total ED volume (3 sites total).

Total ED volume (3 sites total)			
	Supermoon days N=30	Non-supermoon days N=60	
<b>Average</b>	409.63	399.25	$p=0.06$



**Figure 2.** Total ED volume (3 sites total).

**DISCUSSION**

The percent crisis volume was higher on supermoon related days. This difference was statistically significant at  $p=0.013$

The authors were unable to find comparative literature concerning supermoons to crisis related volume. The literature concerning full moons is contradictory.

Our data is consistent with literature that has shown evidence of a relationship of crisis (psychiatric related) volume to the lunar cycle.

**Evidence of a relationship to Psychiatric-Related) volume**

- Homicides, suicides, fatal traffic accidents, aggravated assaults and psychiatric ED visits: evidence of relationship to lunar cycle [3].
- Psychiatric ED visits during full moon periods: evidence of relationship [4].
- Severity of psychiatric illness during full moon periods: evidence of relationship [4].
- Aggressive behavior and full moon periods: evidence of relationship [4].
- Relationship of full moon and non-affective psychoses in

Goa: evidence of relationship [5].

**Re: average patient volume**

The average patient volume for the three sites was higher on supermoon days than on non-supermoon days. However, the difference was not statistically different.  $p=0.06$

The authors were unable to find comparative literature concerning supermoons to crisis related volume. The literature concerning full moons is contradictory.

Our data is consistent with the overall finding from the literature that despite some ED perception, the literature does not appear to support a relationship of the lunar cycle to increased ED volume.

- Thompson and Adams looked at the moon cycle and its relationship to ED volume, ambulance runs, admissions or monitored bed admissions. They found no relationship between the full moon and these four variables [6].
- Coates et al looked at data from 1400 patients from a Level 1 trauma center. They found no difference between full moon days and non-full-moon days [7].
- No relationship of the full moon and ED volume was found by Stair [8].

There is, in fact, some very serious and thoughtful research concerning the effect of the lunar cycle on human physiology [9-25]. Laboratory data exists to support an effect of the lunar cycle on humans and animal physiology [26].

## CONCLUSIONS

The percent crisis volume was higher on supermoon related days. This difference was statistically significant at  $p=0.013$ . The authors were unable to find comparative literature concerning supermoons to crisis related volume. Our data is consistent with literature that has shown evidence of a relationship of behavioral health related volume to the lunar cycle. The average patient volume for the three sites was higher on supermoon days than on non-supermoon days. However, the difference was not statistically different ( $p=0.06$ ). Our data is consistent with the overall finding from the literature that despite some ED perception, the literature does not appear to support a relationship of the lunar cycle to increased ED volume.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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