

Biological Rhythms Interview of Assessment in Neuropsychiatry (BRIAN) Guide of administration

Flávio Kapczinski, PhD, MD

Adriane R Rosa, PhD, PharmD

Pedro Goy, MD

Letícia Zepielewski, PsyD

Laboratório de Psiquiatria Molecular
Instituto Nacional de Ciência e Tecnologia Translacional em Medicina
Hospital de Clínicas de Porto Alegre,
Universidade Federal do Rio Grande do Sul
Porto Alegre, Brasil

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INTRODUCTION:

Daily rhythms are important in everything from sleep/wake cycles, body temperature, hormone levels, to cognition, attention and mood. The social zeitgeber theory suggests that irregular circadian rhythms lead to mood episodes in vulnerable individuals (Grandin et al. 2006). In bipolar disorder, biological rhythm disturbance has been associated with mood symptoms and relapses (Frank et al. 2005; Gruber et al. 2011). Furthermore, evidence has suggested that biological rhythm impairment predicts poor functioning and quality of life (Giglio et al. 2010).

Given the relevance of circadian rhythms disturbance in patients with mood disorders, having a clinical instrument that allows us to assess biological rhythms in psychiatry is critical. There are very few instruments available to measure circadian rhythm which promotes a poor understanding about this issue. In addition, the most of instruments measure one element of the circadian rhythm (sleep) and typically fail to take into account all the other elements necessary for optimal circadian rhythm. However, there is increasing evidence that social rhythms defined by attendance at work, engagement in social activities or recreation, and exercise, may affect circadian regularity as a greater variability of social activities has been consistently related to sleep disturbance (Carney et al. 2006; Morgan 2003). In this context, an adequate understanding and development of specific instruments about the impact of bipolar illness factors on biological rhythms are required.

To this end, the Biological Rhythms Interview of Assessment in Neuropsychiatry (BRIAN) was developed for the clinical evaluation of biological rhythm disturbance (e.g., sleep, social, activity, and eating patterns) experienced by patients suffering from mental disorders.

2. DESCRIPTION OF THE SCALE:

The BRIAN was developed for the clinical evaluation of sleep and rhythm impairment focusing on the main problems experienced by the mentally ill. It consists of 21 items divided into five main areas related to circadian rhythm disturbance in psychiatric patients, namely sleep, activities, social rhythms, eating

pattern and predominant rhythm. In particular, the BRIAN assesses the frequency of problems related to the maintenance of circadian rhythm regularity. For instance:

Do you have problems falling asleep at your usual time? How frequently? (Items are rated using a 4-point scale: (1) = no at all, (2) = seldom, (3) = sometimes, and (4) = often). The total BRIAN scores range, hence, from 18 to 72, where the higher scores suggest severe circadian rhythm disturbance.

The BRIAN is a simple instrument, easy to apply in a short time and applicable in both clinical practice and research settings. It's also useful in clinical trials to evaluate the circadian rhythm disturbance in psychiatric patients.

The five domains of the BRIAN are described below:

- *Sleep*: refers to the capacity to maintain the regularity of the sleep patterns.
- *Activities*: refers to the capacity to maintain the regularity of the daily activities including household and work duties, physical activities, and sexual relationships.
- *Social rhythms*: refers to the capacity to maintain the regularity of the social activities and interpersonal relationships.
- *Eating pattern*: refers to the capacity to maintain the regularity of diet patterns
- *Predominant rhythm*: refers to the preference of work functioning or social functioning during day or night.
- The scale is an interviewer-administered.
- The studied time frame refers to the last 15 days before assessment.
- The scale provides scores for each item.

- The rater has to evaluate the frequency of difficulties experienced by the patients in comparison with the circadian rhythms of a person of the same sex, age and sociocultural status.

3. TRANSLATIONS:

The scale is currently available in three languages: Portuguese, English and Spanish.

4. INSTRUCTIONS FOR ASSESSMENT:

A standardized application of the BRIAN for all patients is extremely important in order to ensure the accuracy of the answers by different raters.

A good and clear introduction of the instrument is fundamental. Before starting with the assessment the interviewer should explain the patients the purpose of the evaluation and also answer their questions.

Some points that should be included in the introduction are: a) name and affiliation of the interviewer; b) If he/she is a doctor or an investigator; c) the questionnaire is important to obtain data with respect to bipolar disorder or psychiatric illness; d) the participation of the patient is voluntary and fundamental for the continuation of the examination/diagnostic phase; e) the answers have to be as objective as possible.

The questions have to be read out loud as they are presented in the questionnaire.

The question: "**Do you have difficulties in completing activities at your work? How frequently?**" has to be asked before each question. Questions have to be repeated when the patient is in doubt or when it appears that the patient did not hear the question well. Additional information obtained through the partner or close relatives has to be considered. As part of the interviewer-administered scale of objective evaluation, the **score must reflect the clinician's evaluation** and not necessarily the literal description of the patient.

5. SCORES:

The BRIAN provides an overall score of the rhythm circadian disturbance of the patient and a score of the subdomains such as sleep, activities, social rhythms and

eating pattern. For each item the scale provides scores. The scores for each items run from 1 to 4. The global score is obtained when the scores of each item are added up. The higher the score, the more often the difficulties are.

The criteria of the scores are:

1: not at all: the circadian rhythm of the patient is in accordance with the norms of the reference group or sociocultural context: there are no difficulties at any moment.

2: seldom: there are difficulties in maintaining the regularity of activities in few days. The patient can be considered as having slight impact.

3: sometimes: there are difficulties in maintaining the regularity of activities in half of the time. The patient can be considered as having moderate impact.

4: often: there are difficulties in maintaining the regularity of activities all the time. The patient is considered to have serious impact.

6. DOMAINS

SLEEP

1) Do you have problems falling asleep at your usual time? How frequently?

This item investigates factors like the frequency and intensity of initial insomnia, the possibility of concomitant discomfort, and the regularity of sleep patterns.

1: Not at all: the patient does not report any difficulties in falling asleep in the same time every night, not lasting more than few minutes to it.

2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days had problems in falling asleep (not more than 30 minutes) like excessive discomfort.

3: Sometimes: the patient reports problems in falling asleep (more than 30 minutes) half of the time in the last 15 days, having excessive discomfort.

4: Often: the patient reports problems in falling asleep (more than 30 minutes) all the time.

2) Do you have problems waking up at your usual time? How frequently?

This item investigates the pattern of awakening, the difficulties faced by the subject and if they exert influences in daily activities performance.

- 1: Not at all: the patient does not report excessive sleepiness, tiredness, fatigue, lack of energy or other factors that influence waking up.
- 2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days had problems in waking up at the usual time, like excessive sleepiness, tiredness, fatigue, lack of energy or other factors that influence waking up.
- 3: Sometimes: the patient reports problems in waking up at the usual time, like excessive sleepiness, tiredness, fatigue, lack of energy or other factors, half of the time in the last 15 days. Sometimes it leads to consequences at work or school performance.
- 4: Often: the patient reports problems in waking up at the usual time, like excessive sleepiness, tiredness, fatigue, lack of energy or other factors all the time with important negative consequences at work or school performance.

3) Do you have problems getting out of bed after you wake up? How frequently?

This item investigates the difficulties faced by the subject in the period just after awakening, frequently related to lack of willing and energy to get out of bed, and problems in starting early morning activities.

- 1: Not at all: the patient reports no difficulties in having enough willing and energy to get out of bed promptly after waking up.
- 2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had problems in having enough willing and energy to get out of bed promptly after waking up.
- 3: Sometimes: the patient reports problems in having enough willing and energy to get out of bed promptly after waking up in half of the time in the last 15 days. Sometimes it leads to negative consequences at work or school performance.

4: Often: the patient reports problems in having enough willing and energy to get out of bed promptly after waking up all the time with important negative consequences at work or school performance.

4) Do you have problems feeling rested with the amount of sleep you usually get (including subjective perception of being rested and actual performance in daily activities, such as driving, working)? How frequently?

This item investigates the existence of a gap between the number of hours slept and the subjective feeling of being rested. This gap is expressed by the unsatisfactory amount of volition, energy and capacity felt by the subject after a usual period of sleep.

1: Not at all: Patient reports no difficulties in feeling rested with the amount of sleep.

2: Seldom: Patient reports difficulties in having energy for the normal performance in everyday activities, or subjective feeling of not being rested in more than five days in the last 15 days.

3: Sometimes: Patient reports difficulties in having energy for the normal performance in everyday activities, or subjective feeling of not being rested in half of the times in the last 15 days.

4: Often: Patient reports difficulties in having energy for the normal performance in everyday activities, or subjective feeling of not being rested all the time.

5) Do you feel you have difficulty in switching off at the time of resting? How frequently?

This item investigates how many times the subject is unable to relax, forget the everyday problems, have a peaceful moment of not thinking in anything when he/she is proposed to do that.

1: Not at all: the patient reports that can easily relax and forget the everyday problems at all the resting times.

2: Seldom: the patient reports that in few days (maximum one third of the time) experienced difficulties in relaxing at the time of resting.

- 3: Sometimes: the patient reports that at least half of the times experienced difficulties in relaxing at the time of resting.
- 4: Often: the patient reports difficulties in relaxing all the time.

ACTIVITY

6) Do you have difficulties in completing activities at your work? How frequently?

This item investigates the performance of the patient in the work duties. Ask to the patient if he/she is able to initiate and finish expected activities. For students and housewives this item may be evaluated according to the fulfillment of their studies/responsibilities, respectively.

- 1: not at all: the performance of the patient is in accordance with the norms of the reference group or the sociocultural context.
- 2: seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, experienced some difficulties with work duties.
- 3: sometimes: the patient is not able to fulfill work duties or finishing daily tasks at least a one week in the last 15 days. Patient experiences a significant lower performance than the reference group.
- 4: often: unemployed patients, patients with invalidity benefit, patients who have taken sick leaves, inpatients or those that have lost a job because of the disease.

Note: For retired patients, answer this question considering the last period of time in which they were employed.

7) Do you have difficulties in completing your household activities? How frequently?

This item investigates the ability of the patients to do shopping or to maintain household activities. It's important to assess if the patient is able to organize a list of products or to administrate his/her budget without requiring help from other people. It is also important ask to the patient if he is able to maintain basic management of the household (including cleaning the dishes, clothes washing, cooking activities).

- 1: not at all: the performance of the patient is in accordance with the norms of the reference group or the sociocultural context.
- 2: seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, experienced some difficulties to do shopping/household activities or does the tasks slowly.
- 3: sometimes: the patient is unable to organize purchases or to do the shopping at least a one week in the last 15 days. Patient needs to some help from other people to perform such activities in most of the time.
- 4: often: the patient is completely incapable of doing the shopping or going to the supermarket all the time. The patient requires the help from other people all the time.

8) Do you have difficulties in keeping your usual rhythm of physical activity (e.g. taking a bus, metro or practicing sports)? How frequently?

This item investigates if the patients experience some problems with daily physical activities, like walking, swimming, cycling, playing soccer or get to the bus. Other activities done related to his/her profession such as trowel, painter, etc. can be considered. This item should be evaluated according to level of regular physical activity.

- 1: no at all: the patient does regular physical activities in his/her routine without difficulties.
- 2: seldom: most of the time the patient does regular physical activities .
- 3: sometimes: the patient does not maintain the regularity of physical activities unless he/she is stimulated for that.
- 4: often: the patient is completely unable to perform any physical activities/ sport all the time. The patient has a complete sedentary lifestyle.

9) Do you have difficulties in performing your daily activities in the time scheduled? How frequently?

This item investigates the degree of regularity in maintaining the timetable of the daily activities.

1. not at all: the patient maintains daily activities in the time scheduled properly.
2. seldom: the patient reports that in few situations (no more than 5 activities) in the last 15 days, experienced some difficulties to maintain daily activities in the time scheduled.
3. sometimes: the patient is able to maintain the regularity of daily activities in the time schedule only when he/she is stimulated for that.
4. often: the patient is completely unable to perform the regularity of his/her daily activities in the majority of the time.

10) Do you have difficulties in keeping your usual level of libido/sexual activity? How frequently?

This item investigates the level of interest of sexual relationships.

1. not at all: the patient experiences satisfactory sexual relationships.
2. seldom: the patient rarely experiences difficulties in having satisfactory sexual relationships.
- 3: sometimes: most of the time the patient experiences difficulties in having satisfactory sexual relationships.
- 4: often: the patient has totally unsatisfactory sexual relationships.

SOCIAL

11) Do you have difficulties in communicating and having interpersonal relationships with significant others? How frequently?

This item investigates if the patients experience some difficulties in relating and communicating with people with whom he/she relates, such as family, friends, neighbors.

- 1: Not at all: the patient does not report any difficulties on his/her relationships, being able to relate and communicate well with people with whom he/she relates, such as family, friends, neighbors.
- 2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days had relational problems with people with whom he/she relates (family, friends, neighbors), such as discussions and disagreements. The patient is able to maintain relationships but has few close ones in his/her life.
- 3: Sometimes: the patient reports problems with their relatives, friends or people with whom he/she relates (family, friends, neighbors), half of the times in the last 15 days, such as intense discussions and fights, resulting in excessive discomfort.
- 4: Often: the patient reports problems relating and communicating with people with whom he/she relates in almost all the times. The patient was not able to establish any consistent relations or communicate with people around him/her.

12) Do you overly use electronic devices to the point that it impairs your interpersonal relationships (such as the television or the internet)? How frequently?

This item investigates if the patients use electronic devices such as TV and internet in a balanced way, without interfering with his/her contact with others or affecting negatively other activities.

- 1: Not at all: the patient does not report any difficulties in using electronic devices, such as TV and internet, in a balanced way, without interfering his/her contact with others or affecting negatively other activities.
- 2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had problems in using electronic devices, with some impairment to his/her routine, such as spending time unevenly with other activities.
- 3: Sometimes: the patient reports that in half of the times in the last 15 days, had problems in using electronic devices with some degree of interference on daily routine.

4: Often: the patient reports problems in using electronic devices in almost all the times, not being able to use them in a balanced way, causing severe impairment on social and occupational life.

13) Do you have difficulties in synchronizing daily routines and sleep patterns with significant others (family, friends, spouse)? How frequently?

This item investigates if the patients experience some difficulties in adjusting his/her routine and sleep pattern when it's necessary regarding people he/she relates, such as family, friends and neighbors.

- 1) Not at all: the patient does not report any difficulties on being flexible, adjusting his/her routine and sleep pattern when necessary regarding people he/she relates, such as family, friends and neighbors.
- 2) Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had difficulties adjusting his/her routine and sleep pattern to others.
- 3) Sometimes: the patient reports problems in adjusting his/her routine and sleep pattern to others half of the times in the last 15 days, suffering when needed to.
- 4) Often: the patient reports problems in adjusting his/her routine and sleep pattern when it's necessary regarding people he/she relates in almost all the times. The patient is inflexible and isn't able to adjust his/her routine and sleep pattern to others.

14) Do you have difficulties in giving attention to significant others (family, friends, spouse)? How frequently?

This item investigates if the patients experience some difficulties in making attention and time available to people with who he/she relates, such as family, friends and neighbors.

- 1: Not at all: the patient does not report any difficulties in making attention and time available to people with who he/she relates, such as family, friends and neighbors
- 2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had problems in sharing time and attention with who demands it.

3: Sometimes: the patient reports problems sharing time and attention with who demands it half of the times in the last 15 days, having excessive discomfort.

4: Often: the patient reports problems in sharing time and attention with who demands it in almost all the times, not being able to make himself/herself available.

DIET

15) Do you have difficulties in keeping the scheduled times for meals? How frequently?

This item investigates if the patients experience some difficulties in keeping with a diet schedule, including breakfast, lunch and dinner.

1: Not at all: the patient does not report any difficulties in eating his/her meals in the same time every night.

2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had problems keeping routine of his/her meals, eating in different times on those days.

3: Sometimes: the patient reports problems in keeping routine of his/her meals half of the times in the last 15 days, frequently altering his/hers meal times.

4: Often: the patient reports problems in keeping routine of his/her meals in almost all the times, in other words, practically didn't eat his/her meals at the same time.

16) Do you skip meals? How frequently?

This item investigates if the patients experience some difficulties in keeping a feeding pattern regarding not skipping meals.

1: Not at all: the patient does not report any difficulties keeping a feeding pattern regarding not skipping meals. The patient ate all his/her meals everyday.

2: Seldom: the patient reports that had problems following the same routine everyday, skipping some meals in few days (no more than 5 days) in the last 15 days.

3: Sometimes: the patient reports problems keeping a feeding pattern regarding not skipping meals half of the times in the last 15 days, frequently skipping meals.

4: Often: the patient reports problems keeping routine of his/her meals in almost all the times, in other words, did not eat all of his/hers meals everyday, skipping or missing it.

17) Do you have difficulties in eating a regular amount during meals? How frequently?

This item investigates if the patients experience some difficulties in keeping a feeding pattern regarding food quantity.

1: Not at all: the patient does not report any difficulties keeping a feeding pattern regarding food quantity everyday, eating similar amount each day without getting hungry or stuffed/full.

2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had some difficulties eating similar quantities of food everyday, eating much more or less in those days.

3: Sometimes: the patient reports problems in eating similar quantities of food half of the times in the last 15 days.

4: Often: the patient reports problems in eating similar quantities of food in almost all the times, practically never eating the same quantity of it.

18) Do you have difficulties in using stimulants with moderation? (such as coffee, coke and chocolate). How frequently?

This item investigates about if the patients have problems regarding consumption of stimulants such as coffee and coke or chocolates and sweets.

1: Not at all: the patient does not report any difficulties consuming healthy/moderate amounts of stimulants in the last 15 days.

2: Seldom: the patient reports that in few days (no more than 5 days) in the last 15 days, had problems consuming stimulants, like excessive ingestion of coffee and coke, or chocolates and sweets.

3: Sometimes: the patient reports problems consuming stimulants half of the times in the last 15 days, having excessive ingestion of coffee and coke, or chocolates and sweets in a way that affected his/her sleep or energy.

4: Often: the patient reports problems consuming stimulants in almost all the times, almost never ingesting moderately stimulants such as coffee and coke or chocolates and sweets.

PREDOMINANT RYTHM (CHRONOTYPE)

Consider the last 12 months for the following questions.

19) Tends to be more energized for work and interpersonal relationships at night.

1: Never: the patient considers himself to have better cognitive performance for working, studying or reading; and also tend to be more sociable and talkative always during the day and never at night.

2: Seldom: the patient reports that in no more than one third of the days, considers himself to have better cognitive performance for working, studying or reading; and also tend to be more sociable and talkative at night.

3: Often: the patient reports that in most of the days, considers himself to have better cognitive performance for working, studying or reading; and also tend to be more sociable and talkative at night.

4: Always: the patient considers himself to have better cognitive performance for working, studying or reading; and also tend to be more sociable and talkative always at night and never during the day.

20) Feels more productive in the morning.

1: Never: the patient considers him/herself to be more productive and efficient regarding working, studying, concentrating, paying attention, housekeeping or exercising always in the afternoon or at night, but never in the morning.

2: Seldom: the patient reports that in no more than one third of the times, he/she considers him/herself to be more productive and efficient regarding working, studying, concentrating, paying attention, housekeeping or exercising in the morning.

3: Often: the patient reports that in more than half of the times, he/she considers him/herself to be more productive and efficient regarding working, studying, concentrating, paying attention, housekeeping or exercising in the morning.

4: Always: the patient reports that in all, or almost all of the times, he/she considers him/herself to be more productive and efficient regarding working, studying, concentrating, paying attention, housekeeping or exercising in the morning.

21) Do you have your day/night cycle reversed?

1: Never: the patient reports that had never experienced staying awake all night long and spending the day sleeping.

2: Seldom: the patient reports that in no more than one third of the days has experienced staying awake all night long and spending the day sleeping.

3: Often: the patient reports that in more than half of the days has experienced staying awake all night long and spending the day sleeping.

4: Always: the patient reports that in all, or almost all of the days has experienced staying awake all night long and spending the day sleeping.

NOTE: If patient is a night worker, be aware to reverse the question.

- *The items 19, 20 and 21 are used just for giving us information about chronotype. Moreover, these items are not considered in the sum of global score of the instrument.*

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