Universitetet i Bergen

CANDIDATE

122

TEST

PSYK140 0 Atferd, helse og ernæring

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Praktisk informasjon

PSYK140 - Behaviour, health and nutrition
May 15th 2017, 09.00-13.00

- No examination aids allowed.
- You will receive three assignments, you are supposed to answer two of them. You are free to choose the two assignments yourself.
- Both assignments must be answered satisfactory in order to pass the exam.
- For å endra målform: Trykk på menystrekane oppe i høgre hjørne/For å endre målform: Trykk på menystrekene i høyre hjørne.

The exam assignment and your answer are available in Inspera Assessment when the examination is over.

Assessment, explanation of grades and right to appeal
Your result on the exam will be announced on June 8th. You will receive an e-mail when the result is published on StudentWeb. Information about explanation of grades and possibilities to appeal will be published on Mitt UiB when the grade has been announced

1 Eksamensoppgåva

Fill in your answer here

Assignment 1:
Eating disorders are becoming a bigger and bigger problem in western socialized countries. The beauty ideal for women is to be thin and for men on the other hand lean and muscular. In modern day society a slim person is being valued more, than a person with normal or overweight. The looks of an individual are more important then their personality. Therefore there is a huge pressure especially on women and young girls to look a certain way. In sensitive men and women this pressure can lead to an eating disorder. According to studies the prevalence of anorexia nervosa, which is a type of eating disorder is 0.3% in the world. With Binge eating disorder the prevalence lies at 1-2% and with Bulimia nervosa it lies at 1-3.5% in the world. Eating disorders are most prevalent in adolescents and young girls, but also older women can show an eating disorder.

Eating disorders are defined as a lasting disruptive eating behavior and weight control behavior that has a large impact on the somatic health and social-psychological functioning. A person with an eating disorder shows abnormal eating behavior, abnormal thoughts about weight and body shape and abnormal thoughts about eating and food. The diagnostic manuals (DSM-5 and ICD-10), used in psychology, characterize eating disorders into different groups: Anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorders (BED) and eating disorders not otherwise specified (EDNOS). Anorexia nervosa is an eating disorder were there can be seen self-induced weight loss through restrictive eating. BMI unter 17.5 and ammorhea are criterias of AN. There are two different types of AN: restrictive type and the binge eating/purging type. The restrictive type show a behavior of restrictive eating and also overexercising. The binge eating/purging type shows behavior of binge eating followed by self-induced vomitting or misuse of laxatives or diuretics. With BN you see binge eating followed by the counteracting of the fattening affect of the food by self-induced vomiting, purging or misuse of drugs, laxatives or diuretics. With BN there is no weight criteria. In BN and AN you see similar psychpathologies. A fear of getting fat, self-worth and self-esteem ist overly attached to their weight, body shape and control over them and wrong perception/evaluation of body weight. BED are recurrant episodes of binge eating with loss of control without the counteracting acts of purging. Individuals with BED usually feel uncontrollably full and disgusted with themselves after a binge, because they eat large amounts of food in a short time even though not beeing hungry. For individuals with BED it is a mechanism of coping with negative feelings like anxiety, anger or distress. EDNOS are eating disorders that don't meet the criteria of AN, BN or BED. Individuals are usually put in one of the three following groups: sub-threshold symptoms, extremly abnormal symptoms or mixed symptoms of AN, BN and BED. The cause of an eating disorder is not well understood and multifactorial.

There are Treatment approaches for eating disorders in which some are better researched than others. In AN it is most commen to use cognitive based therapy (CBT), but also family based behavioral treatment is often used. Furthermore mentalisation therapy is used in some individuals and pharmacological approaches are not commely used. In BN over 50 trials have been made and most of them showed consistent results: CBT is the most effective approach to treat BN. But also in BN the family based therapy is used often. The treatment in

BED is mostly CBT and interpersonal therapy. There are almost no studies on the treatment of EDNOS, that is why the same approaches as in AN and BN are used.

Cognitive behavioural treatment is an intervention based on the Link between thoughts, feeling and shown behavior. This means the thoughts someone is thinking leads to feelings they are feeling and their feelings lead into how the person acts (behavior). There are two different types of CBT: an intensive version with 40 sessions for individuals with a BMI lower than 17.5 and a normal version for individuals with a BMI over 17.5. Furthermore a broad version and a normal version of CBT are distinguished. The normal version contains the core default version and the broad version contains additional elements. There can be group version, an adult version, an young outpatient version and an intensive version. The treatment plan is usually made up of 4 stages. Through different studies a lot of advantages could be seen in the treatment of individuals with eating disorders. 40-50% of the treated individuals stoped binge eating and an increase in body weight and in self-esteem could be shown.

Faiburn et al. developed the cognitive behavioural therapy enhanced with an transdiagnostic view. The CBT-E is still based on cognitive and behavioural therapies, but is broadend to a more wider concept. A lot of patients have different diagnosis of eating disorders throughout their medical history. Meaning it is easy to go from one eating disorder into another. Furthermore eating disorders have more similarities than differences when it comes to their characteristica. Because of these two arguments Faiburn et al. suggested that the different eating disorders, like AN, BN, BED and EDNOS, should not be seen as different disorders, rather as one single clinical category. The diagnostic manuals DSM-5 and ICD-10 give different treatment approaches for the four different eating disorders, showing that different disorders should be handle another way. Faiburn et al. challange this thought and relies on his transdiagnostic concept. The core psychopathology of eating disorders is the overevaluation of body shape and weight. In addition the self-esteem and self-worth of the individual is linked to their body weight, shape and the control over these two. This means that every patient with an eating disorders experiences these psychological thoughts in the development in the disorder. A patient with an eating disorder is not developing another medical condition, underlining the argument of a single clinical category. With this transdiagnostic view there is only the category of an eating disorder and not four different single categories (AN,BN;BED;EDNOS), therefore every patient with an eating disorder can be treated with the CBT-E. Even individuals with a complex eating disorder can be treated with CBT-E. This concludes that there is a higher chance of recovering people from an eating disorder. Meaning less binges, certain amount of weight gain and a healthy emotional and psychological state.

Primary maintaining mechanisms of this disorder are psychological thoughts and feelings that are connected to the body weight and shape. As mentioned above their self-esteem and self-worth is overly attached to body weight and shape. In order to leave the eating disorder behind, they have to find a new way to define thir self-worth. In addition the overevaluation of their body and weight has to be challenge and a new perspective on body weight and shape has to be gained. Because patients feel so great about their accomplishment of low weight it is very scary for them to give up this feeling. Through the low weight they feel a purpose in life and could rebuilt their broken self-worth. The eating disorders has become their whole life. Individuals main thoughts during the day are about food, eating and their weight. In comparison to a person without an eating disorder, who only spends a small amount of time thinking about food, eating and weight. They on the other hand think about work, family, friends and more. Secondary maintaining mechanisms of an eating disorder are there state of isolation and social-withdrawl, making it a very hard time to integrate into society again. Eating with other people, like friends and family is a big challenge. New eating habits and a new outview on eating have to me maintained.

Fairburns transdiagnostic view is a great step into treating patients more individually. Even though there are some good treatment approaches out there, they still fail to recover a lot of patients. Every patient is different and the therapy therefore should be molded to the person individually. Still a lot of work and research has to be done in order to treat patients accordingly. In the future more work could be done in the field of eating disorder prevention. Furthermore there is a big debakel on patients send to therapy involuntarily. The best scenario would be that patients themselves regonized their eating disorder and seek help. But that is not the case in most individuals. A lot of them don't even recognize or don't want to realize they have an eating disorder. That makes it a controversial problem for the initiation of the treatment.

Assignement 3:

The earth rotates around its axis dividing the day into a dark time period - night and a light time period - day. Organisms on the earth have gained the knowledge to adjust their metabolism to this cycle in the most effective way. Some organisms show activity during day, making them diurnal and other organisms show activity during night, making them nocturnal. These cycles of the metabolism are called circadian rhythms and the field of study is named chronobiology. A lot of pathways in the metabolism are influenced by circadian rhythms, so for example expression of genes and enzymes, secretion and production of hormones, like insulin, ghrelin or leptin and also the glucose homeostasis.

The circadian rhythm is made by the biological clock called suprachiasmatic nucleus in the hypothalamus. It

contains many single cell oscillators that synchronize together in order to create a circadian output. Such oscillators are also found in peripheral tissues, for example in the liver, heart or gut. Clock genes are components of the circadian rhythm and can be found in all kinds of tissue in the body. There are four groups of clock genes: CLOCK, BMAL1, Cry1-2 and Per1-3. These genes interact with each other in a negative feedback loop that contains repression and activation making up a 24 hour cycle. The genes are devided in a negative component, consisting of CLOCK and BMAL1 and a positive component consisting of Cry and Per. The positive component activates the expression of the Cry and Per genes and the negative component inhibits the CLOCK and BMAL1. In order to understand this mechanism a detailed view is necessary.

Transcription factors CLOCK and BMAL1 demerize in the cytoplasma and build a heterodimer. This heterodimer CLOCK:BMAL1 translocates into the nukleus and activates the expression of Per1-3 and Cry1-2 genes through binding at the E-box. The transcription factors Per and Cry inhibit the heterodimer CLOCK:BMAL1 together and thus inhibit their own genes. Furthermore CLOCK and BMAL1 activate the expression of roralpha and Rev-erbalpha. These two transcription factors play an inportant role in the lipid metabolism. The expression of these genes is also inhibited by Per and Cry in the same way as mentioned above. Roralpha activates the transcription of the BMAL1 gene and Rev-erbalpha inhibits the transcription of the BMAL1 gene. And lastly CLOCK:BMAL1 activates the transcription of the nuclear receptor Pparalpha which helps the transcription of the gene BMAL1 and Rev-erbalpha. Once again the heterodimer CLOCK:BMAL1 is inhibited by Cry and Per. This whole cycle of activation and inhibition makes up an approximately 24 hour cycle creating the circadian rhythm.

If the SCN would run freely it would create a cycle over 24 hours. That is why we need timegivers (Zeitgeber) in order to prevent the oscillators from drifting. Timegivers are for example light and food/eating. If light hits the retina in the eye, this signal is sent further to the SCN in the brain. The SCN synchronizes its oscillators and in addition sends autonoums and humoural signals to peripheral tissues like the liver, heart and gut. In the periphal tissue the oscillators are trained on the same cycle and show the secretion of hormones and metabolic pathways in a certain circadian rhythm. Food and eating behaviors influence the SCN and also the peripheral tissues and act as a timegiver in a certain way.

For example the secretion of cortisol and the sleep/wakefullness cycle show a circadian rhythmicity. Cortisol is a steroid hormone that is secreted during stress and low blood sugar. It acts in many different ways and has an important role in the bodys functioning. Cortisol reaches its highest level early in the morning around 08.00 h. During the day the cortisol levels sink until they reach their minimum in the evening. A little rise in cortisol level can be seen around the late at night. The sleep/wakefullness cycle is a balance between inhibition and activation of neurons in the brain. Three main factors influence the sleep/wakefullness state: homeostatic factor, circadium factor and behavioral factor. Promoting wakefullness are two main activation systems: the monoaminergic and the cholinergic system. The monoaminergic system consists of the neurtransmitters: serotonin, noradrenalin and dopamin. The cholinergic system consists of the neurotransmitter Acetylcholine, which is released by LDT and PPT neurons in the brain. Monoaminergic neurons have a rapid firing rate during wakefullness and a lower firing rate during Non-REM sleep. Cholinergic neurons have a high firing rate during wakefullness, but also during REM sleep. This concludes that the two activation systems promote the arousal state. Sleep is divided into REM sleep stage and non-REM sleep stage. Both sleep stages have different characteristics. Now on the other hand VLPO and MNPO neurons promote sleep. VLPO and MNPO release the inhibitory neurotransmitters GABA and Galanin. These neurons innervate the regions of the arousal-promoting neurons. They show high firing rates during REM sleep. During the day high firing rates of cholinergic and monoaminergic neurons silence the firing of the VLPO and MNPO neurons. But during night VLPO and MNPO neurons inhibit the firing of the arousal-promoting neurons, thus disinhibiting themselves.

As mentioned above eating and food is a timegiver for the circadian rhythm. Eating three meals during the day is not only important for the the rhythmicity but also important for the overall wellbeing of the body and mind. Animal need food to fuel their body with energy. Different researchers have been looking into the effect of the different meals throughout the day: breakfast, lunch, dinner and also snacks, in order to find out how these meals affect us cognitively and behaviorally. Breakfast has been shown to have a very positive effect on the cognitive performance of the individual. Because breakfast is the first meal after a long period of fasting during sleep the body know gets fueld up again. Studies have found out that brekfast enhances the creativity and the ability to soleve mathematical proplems. In adults it showed better results on mathematical tests and in elderly it showed positve effects on memory tests. In children a heightend schoolastic performance could be outlined. Lunch is not as well studied as breakfast though there are different trials suggestign that eating a meal in the middle of the day has a more negative effect on the body. This suggestion also has to be looked at from the angle of the circadian rhythmicity. Because during the afternoon humans show a lack in concentration and attention. The perform worse on cognitive performance tests. Furthermore it could be seen that individuals, who are used to eating big meals are not that affected by lunch. One study could see that their participants have a shorter reaction time during a carbonhydrate rich meal and have less cognitive performance during a protein rich meal. The effect of evening meals is even less studied. Researchers suggest that it might have a positve effect on the person. One study gave their participants an evening meal at around 18.00-18.45 h and their control group no meal. Participants, that ate a meal were more concentrated and motivated. Whilst studying the effect of meals on the body a lot of individual factors have to be accounted. For example the age of the individual eating a meal plays a role. Children are more positively influenced by breakfast than older people. The negative effects of lunch have a greater outcome on elderly then on other age groups. Also the nutriotional state plays a role. Poorly nourished children are more negatively effected by skipping breakfast. Furthermore individuals with an anxiety disorder report better mood and state after eating. It has been observed that hungry people are more irritable and angry. Whereas people that just have eaten feel more

relaxed and at ease.

A lot of researchers have commited their work to the field of chronobiology and still try to make more sense out of our bodys rythms. Even though a lot of information is know, there is still a lot of uncertainity. The circadian rhythm is a finely tuned system that can be easily desynchronized. For example the shifting of sleep/wakefullness cycle and the cortisol release would cause immense damage on the bodys metabolism. Also the exposure to timegivers like food at a different time then usual is contraproductive. Different effects of meals on the body depending on the time of the food intake is suggested by researchers, but a more in depth view of the effects is hard to say.

Answered.

Attaching sketches to this question?
Use the following code:

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