



ANXIOUS-DEPRESSIVE COMORBIDITY IN BINGE EATING DISORDER IN A CLINICAL SAMPLE OF ADOLESCENTS

LAPORTA-HERRERO, ISABEL^a & LATORRE-FORCÉN, PATRICIA^b

^a *Universidad Nacional de Educación a Distancia (UNED), Facultad de Psicología;* ^b *Unidad de Corta Estancia de Psiquiatría, Hospital Opispo Polanco*

Abstract

Most of the scientific literature on Binge Eating Disorder (BED) in adolescents is based on studies with community or subclinical samples. Therefore, this study aims to determine the possible anxiety-depressive comorbidity in a sample of adolescents diagnosed with BED. The sample composed by 21 adolescents diagnosed with BED, aged between 13 and 15 years ($M = 14.10$, $SD = .99$). All of them received psychological and/or psychiatric treatment in a specific child-adolescent eating disorders unit of the National Health System of Spain. The adolescents completed the Spanish Child Depression Questionnaire (CEDI-II) and the State-Trait Anxiety Inventory for Children (STAIC). Data analysis shows that the majority of the sample did not show state anxiety (66.7%), but showed trait anxiety (57.1%). Furthermore, more than half of the patients presented moderate or severe depression (61.9%). The results indicate that the majority of patients with BED in the clinical sample had a tendency to react anxiously and suffer from depressive symptoms. The study highlights the comorbidity of anxiety-depressive symptoms in clinical samples, and points out the importance of taking into account anxiety-depressive symptoms in the evaluation and treatment of adolescents with BED.

Keywords: *binge eating disorder, adolescents, depression, anxiety.*

1. INTRODUCTION

Feeding and eating disorders (ED) are characterized by “a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning” (American Psychiatric Association, 2013, p. 329). ED usually start in adolescence (Rohde et al., 2015). Within the ED, Binge Eating Disorder (BED) is characterized by “recurrent episodes of binge eating” like “eating an amount of food that is definitely larger than what most people would eat in a similar period of time under similar circumstances and with a sense of lack of control (LOC) over eating during the episode” (American Psychiatric Association,

Corresponding author: Isabel Laporta-Herrero

E-mail address: isabelaporta@hotmail.com

2013, p. 350). These binge-eating episodes have particular characteristics and a marked distress after these. Also, they are not followed by compensatory behaviors like physical exercise, self-induced vomiting, purging or use of diuretics or laxatives.

It is known that between 1 and 3% of adolescents suffer from BED, being significantly more frequent in girls than in boys (Smink et al., 2014). Furthermore, girls indicate more LOC and distress during binge episodes (Lee-Winn et al., 2016). However, the diagnosis of BED in adolescents is usually complicated. It is difficult for the adolescent to report with sincerity and clarity what they eat and, above all, to recognize LOC (Tafonsky-Kraff et al., 2007). For this reason, it is necessary to do an adequate diagnostic interview by a specialist such as psychiatric or clinical psychologist (Marzilli et al., 2018).

Psychiatric comorbidity in BED can increase its severity, chronicity and resistance to psychological and/or psychiatric treatment. It has been associated with an impairment in quality of life, an increased risk of weight gain and obesity, and higher medical mortality (Kessler et al., 2013; Thornton et al., 2017). Most research to date on comorbidity in BED has focused on the adult population. Various studies in adults with BED show how this ED is associated with diverse consequences, such as greater concern about weight and shape (Yiu et al., 2017), and clinical and subclinical symptoms of anxiety and depression (Araujo et al., 2010; Bittencourt et al., 2012).

Carrying out a review of the scientific literature, we observe how surprisingly the majority of studies on BED are based on community samples. In fact, BED in adolescence is being recently investigated (Lipsky & McGuinness, 2015), so there is little research in this field today. To date, BED in adolescents has been associated with social impairment (Swanson et al., 2011), obesity (Micali et al., 2014), and other psychological difficulties like depressive and anxious symptoms (Allen et al., 2013; Dakanalis et al., 2018; Field et al., 2012; Micali et al., 2014; Skinner et al., 2012; Sonnevile et al. 2013). However, all studies have been carried out in community samples of adolescents or taking into account only subclinical characteristics of BED (Touchette et al., 2011). These studies have basically determined the diagnosis of BED by applying a self-applied assessment instrument such as the *Binge Eating Scale* (BES) (Gormally et al., 1982), and have attempted to explore the associated clinical characteristics, relating it to other variables evaluated with other questionnaires. As far as we know, we have not found investigations in clinical samples of adolescents diagnosed with BED that allow us to know the relationship of the study variables.

Therefore, due to the difficulty in establishing the diagnosis of BED in adolescents and the need for it to be carried out by specialists, the results obtained in the investigations carried out so far in the community or subclinical population remain in doubt. From our perspective, we consider it necessary to evaluate the

possible relationship between adolescents diagnosed with BED and anxious-depressive symptoms in clinical samples. Therefore, the main objective of the present study is to determine the possible anxiety-depressive comorbidity in a sample of adolescents diagnosed with BED.

2. OBJECTIVE AND HYPOTHESES

2.1. OBJECTIVE

The main objective of the present study is to determine the possible anxiety-depressive comorbidity in a sample of adolescents diagnosed with BED.

2.2. HYPOTHESES

H₁: Adolescents with BED show anxious symptoms.

H₂: Adolescents with BED show depressive symptoms.

3. METHOD

3.1. PARTICIPANTS

The sample consisted of 21 patients diagnosed with BED, 81% women and 19% men, aged between 13 and 15 years ($M = 14.10$, $SD = .944$) who were attended in an ED unit. The mean body mass index (BMI) of the patients was 31.44 ($SD = 6.428$). As for the place of residence, 52.4% lived in rural media and 47.6% in urban media. All were students, 66.7% of the sample went to a public school compared to 33.3% who attended a private school. See Table 1.

Table 1 - Descriptive data of sociodemographic variables of the sample (n=21)

Variables	N (%)
Sex:	
- Males	4 (19.0)
- Females	17 (81.0)
Area of residence:	
- Rural	11 (52.4)
- Urban	10 (47.6)
School:	
- Public	14 (66.7)
- Private	7 (33.3)
BMI:	
- Normal (BMI = 20-25)	3 (14.3)
- Overweight (BMI = 25-30)	9 (42.9)
- Obese (BMI > 30)	9 (42.9)

Note. BMI = Body Mass Index.

3.2. INSTRUMENTS

Spanish Child Depression Questionnaire (CEDI-II) by Rodríguez Sacristán and Cardoze (1984), Spanish adaptation from the Depression Inventory for Children (CDI) by Kovacs (1992). It is a self-applied questionnaire with 16 items with 4 response possibilities. We used the second form (CEDI-II) for boys and girls from 11 to 16 years old. It evaluates depressive symptoms in childhood and adolescence. It establishes a classification according to the degree of depression and the score obtained in the questionnaire: without depression (score below 7 points), light depression (7-12 points), moderate depression (13-17 points) and severe depression (score equal or greater than 18 points).

State-Trait Anxiety Inventory for Children (STAIC) by Spielberger (1973). It is a self-applied inventory with 20 items with a 3-point Likert response pattern. It assesses global anxiety according to different situations. It can get a score between 0 and 60 points. Percentiles higher than 85 are considered as cut-off point (González Anido et al., 2009). It shows good consistency and discrimination in adolescent samples.

Body Shape Questionnaire (BSQ-34) by Cooper et al. (1987). We used the Spanish version of Raich et al. (1996). It is a self-reported questionnaire that consists of 34 items with a 6-point Likert response pattern. It evaluates body dissatisfaction, desire to low weight, fear of gaining weight and appearance-related low esteem. It can get a score between 34 and 204, where 105 is the cut-off point. It establishes a classification according to the degree of concern for body image: no concern (score below 80 points), slight concern (81-110 points), moderate concern (111-140 points) and extreme concern (score equal or greater than 141 points) (Cooper & Taylor, 1988). It shows high internal consistency (Cronbach's alpha of 0.95-0.97).

3.3. PROCEDURE

This is a descriptive, retrospective, quantitative, and transversal design.

After receiving the appropriate permissions from the responsible for the ED Unit, we collected the results of the questionnaire scores from the patients' medical records. These questionnaires are applied to each person who begins their intervention in the ED Unit. To collect the sample, we established the following inclusion and exclusion criteria: 1) Patients between 13 and 15 years old; 2) Meeting diagnostic criteria of the DSM-5 (APA, 2013) for BED, 4) Not having a borderline intelligence or intellectual disability; and 5) Receiving psychological and/or psychiatric treatment in the ED Unit. The diagnosis was established by the Unit's clinical psychologist or psychiatrist, through clinical interviews with the patient and the patient's parents or caregivers. A code was assigned to each patient to guarantee their anonymity and confidentiality principle. Under this code, the diagnosis, age, sex, area of residence and type of school were collected. All the

information obtained was processed in accordance with the provisions of Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights.

3.4. DATA ANALYSIS

Data were analysed with the *Statistical Package for the Social Sciences* (SPSS), version 19. Regarding the statistical analyzes used, depending on the nature of the variables, the appropriate descriptive statistics were performed.

4. RESULTS

First, we carried out a descriptive analysis of the main results of the questionnaires in the total sample ($n = 21$). Taking the total study sample, the means questionnaires scores do not exceed the relevant cut-off point for the STAIC ($M < 85$), but the mean of the participants shows a score corresponding to a moderate depression ($M = 14.43$). See Table 2.

After that, we analyze each one of the variables separately. Regarding the anxious clinic, the majority of the sample (66.7%) showed no anxiety state, but had trait anxiety (57.1%). Regarding the depressive symptomatology, the majority of the sample (38.1%) showed a moderate depression and 61.9% of the sample reported moderate or severe depression. See Table 2.

Table 2 - Descriptive statistics of STAIC and CEDI-II scores

	N (%)	Minimum	Maximum	M (SD)
STAIC State		10	99	66.90 (26.21)
Presented (> 85)	7 (33.3)			
Absent (< 85)	14 (66.7)			
STAIC Trait		4	98	78.14 (21.07)
Presented (> 85)	12 (57.1)			
Absent (< 85)	9 (42.9)			
CEDI-II		4	27	14.43 (6.03)
Without depression (< 7)	1 (4.8)			
Light depression (7 - 12)	7 (33.3)			
Moderate depression (13 - 17)	8 (38.1)			
Severe depression (> 18)	5 (23.8)			

Note. STAIC = State-Trait Anxiety Inventory for Children; CEDI-II = Spanish Child Depression Questionnaire.

5. CONCLUSIONS

The main objective of this study was to determine the possible anxiety-depressive comorbidity in a clinical sample of adolescents with BED. On the one hand, the results indicate that the majority of patients in the sample studied exhibited trait anxiety. In other words, adolescents with BED showed a tendency to react anxiously, to perceive situations as dangerous and / or threatening, and to respond to these situations with anxiety. These findings are in line with previous studies with subclinical (Touchette et al., 2011) or community (Allen et al., 2013; Dakanalis et al., 2018; Micali et al., 2014) samples of adolescents.

The comorbidity of the anxiety trait in adolescents with BED could explain the propensity of these patients to binge as an inadequate strategy for managing situations. People with BED seem to experience stressors and related emotions differently. They have been seen to experience greater negative stressors (in areas such as school, family, friendship, the environment...) and are less able to tolerate negative emotional states, compared to healthy controls (Crowther et al., 2001).

On the other hand, a higher percentage of patients in the study sample presented moderate depressive symptoms. This is consistent with the review carried out by Araujo et al. (2010) on BED and depression in the adult population, and with studies carried out on community or subclinical samples of adolescents (Allen et al., 2013; Carriere et al., 2019; Dakanalis et al., 2018; Field et al., 2012; Micali et al., 2014; Skinner et al., 2012; Sonnevile et al. 2013; Touchette et al., 2011).

The presence of depressive symptoms in adolescents with BED could be interpreted in two opposite but complementary ways. People with depressive symptoms may resort to binge eating as a form of emotional self-regulation, and / or having a BED may lead to the development of depressive symptoms (Sonneville et al. 2013; Skinner et al., 2012). An investigation carried out in a community sample of adolescents (Adamus-Leach et al., 2013), found an association between the presence of depressive symptoms and greater severity of BED symptoms. They concluded that binge eating would be more related to the person's mood, and they are an inadequate form of emotional regulation. Feelings of intense discomfort often precede binge episodes (Schag et al., 2013), and several researchers have suggested that binge eating may be considered a maladaptive strategy for coping with negative mood states (Ágh et al., 2015).

However, the study presents a series of limitations that must be taken into account. The sample has been selected using a non-probability sampling method, and it is not an experimental study. One of the most important limitations of the study refers to the small sample size ($n = 21$). However, reviewing the few studies that currently exist that use clinical samples from adolescents with BED, they

usually do not have more than 40 patients (Schmidt et al., 2015). Likewise, there may be a lack of sincerity in the answers when using self-reports.

Without a doubt, one of the future lines of research in this field would be to expand studies with clinical samples of adolescents with BED. We consider that the evaluation of possible risk factors, predictors or preventives, as well as the comorbidity of BED cannot be based on studies with population samples, which assess the presence of BED through a self-applied questionnaire. Establishing a diagnosis of BED in adolescents is not something simple, and should be carried out by a specialist in the subject, a psychiatrist or clinical psychologist. Future research could replicate this research with larger clinical samples, and consider other types of variables that could be related to BED in adolescents, such as impulsivity or emotional regulation (Dingemans et al., 2017).

In conclusion and based on the implications for clinical practice applied to the study, it is worth outstanding the importance of taking into account the psychopathological comorbidity exhibited by this type of patient in both evaluation and treatment. We believe that equipping these patients with emotional regulation and anxiety management strategies could be beneficial for these patients who often resort to binge eating as an inappropriate strategy for managing emotional distress.

Received at:01.09.2020, Accepted for publication on: 28.09.2020

REFERENCES

Adamus-Leach, H. J., Wilson, P. L., O'Connor, D. P., Rhode, P.C. Mama, S. K., & Lee, R. E. (2013). Depression, stress and body fat are associated with binge eating in a community sample of African American and Hispanic women. *Eating and Weight Disorders*, 18(2), 221-227. <https://doi.org/10.1007/s40519-013-0021-3>

Ágh, T., Kovács, G., Pawaskar, M., Supina, D., Inotai, A., & Vokó, Z. (2015). Epidemiology, health-related quality of life and economic burden of binge eating disorder: a systematic literature review. *Eating and Weight Disorders*, 20(1), 1-12. <https://doi.org/10.1007/s40519-014-0173-9>

Allen, K. L., Byrne, S. M., Oddy, W. H., & Crosby, R. D. (2013). Early onset binge eating and purging eating disorders: course and outcome in a population-based study of adolescents. *Journal of Abnormal Child Psychology*, 41(7), 1083-1096. <https://doi.org/10.1007/s10802-013-9747-7>

American Psychiatric Association, APA. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. American Psychiatric Publishing.

Anderson, N. K., & Nicolay O. F. (2016). Eating disorders in children and adolescents. *Seminars in Orthodontics*, 22(3), 234–237. <https://doi.org/10.1053/j.sodo.2016.05.010>

Araujo, D. M. R., Santos, G. F. D., & Nardi, A. E. (2010). Binge eating disorder and depression: A systematic review. *World Journal of Biological Psychiatry*, *11*(2), 199-207. <https://doi.org/10.3109/15622970802563171>

Carriere, C., Michel, G., Féart, C., Pellaly, H., Onorato, O., Barat, P., & Thibault, H. (2019). Relationships between emotional disorders, personality dimensions, and binge eating disorder in French obese adolescents. *Archives de Pédiatrie*, *26*(3), 138-144. <https://doi.org/10.1016/j.arcped.2019.02.008>

Cooper, P. J., & Taylor, M. J. (1988). Body image disturbance in bulimia nervosa. *British Journal of Psychiatry*, *153*(2), 32-36. <https://doi.org/10.1192/S0007125000298966>

Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairburn, C. G. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders*, *6*, 485-494. [https://doi.org/10.1002/1098-108X\(198707\)6:4<485::AID-EAT2260060405>3.0.CO;2-O](https://doi.org/10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O)

Crowther, J. H., Sanftner, J., Bonifazi, D. Z., & Shepherd, K. L. (2001). The role of daily hassles in binge eating. *International Journal of Eating Disorders*, *29*, 449-454. <https://doi.org/10.1002/eat.1041>

Dakanalis, A., Zanetti, M. A., Colmegna, F., Riva, G., & Clerici, M. (2018). Classifying binge eating-disordered adolescents based on severity levels. *Journal of Adolescence*, *62*, 47-54. <https://doi.org/10.1016/j.adolescence.2017.10.003>

Dingemans, A., Danner, U., & Parks, M. (2017). Emotion regulation in binge eating disorders: A review. *Nutrients*, *9*(11), 1274. <https://doi.org/10.3390/nu9111274>

Field, A. E., Sonneville, K. R., Micali, N., Crosby, R. D., Swanson, S. A., Laird, N. M., Treasure, J., Solmi, F., & Horton, N. J. (2012). Prospective association of common eating disorders and adverse outcomes. *Pediatrics*, *130*(2): e289-e295. <https://doi.org/10.1542/peds.2011-3663>

González Anido, A., Pérez Cabeza, L., Erkoreka González, L., Alonso Ganuza, Z., Azcarraga Orbe, M., de Pedro Ullate, R., Touza Piñeiro, R., Rahmani, R., Olazábal Eizaguirre, N., & León Álvarez, C. (2009). Ansiedad en niños y cuidadores que acuden a un servicio de urgencias pediátricas hospitalarias. *Norte de Salud Mental*, *35*, 20-29.

Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors*, *7*(1), 47-55. [https://doi.org/10.1016/0306-4603\(82\)90024-7](https://doi.org/10.1016/0306-4603(82)90024-7)

Kessler, R. C., Berglund, P. A., Chiu, W. T., Deitz, A. C., Hudson, J. I., Shahly, V., Aguilar-Gaxiola, S., Alonso, J., Angermeyer, M. C., Benjet, C., Bruffaerts, R., de Girolamo, G., de Graaf, R., Haro, J. M., Kovess-Masfety, V., O'Neill, S., Posada-Villa, J., Sasu, C., Scott, K., Viana, M. C., & Xavier, M. (2013). The prevalence and correlates of binge eating disorder in the world health organization world mental health surveys. *Biological Psychiatry*, *73*(9), 904-914. <https://doi.org/10.1016/J.BIOPSYCH.2012.11.020>

Kovacs, M. (1992). *Children's Depression Inventory, CDI*. Multi-Health Systems, Inc.

Lee-Winn, A. E., Reinblatt, S. P., Mojtabai, R., & Mendelson, T. (2016). Gender and racial/ethnic differences in binge eating symptoms in a nationally representative sample of adolescents in the United States. *Eating Behaviors*, *22*, 27-33. <https://doi.org/10.1016/j.eatbeh.2016.03.021>

- Lipsky, R. K., & McGuinness, T. M. (2015). Binge eating disorder and youth. *Journal of Psychosocial Nursing and Mental Health Services*, 53(8), 18-22. <https://doi.org/10.3928/02793695-20150720-03>
- Marzilli, E., Cerniglia, L., & Cimino, S. (2018). A narrative review of binge eating disorder in adolescence: prevalence, impact, and psychological treatment strategies. *Adolescent Health, Medicine and Therapeutics*, 9, 17-30. <https://doi.org/10.2141/AHMT.S148050>
- Micali, N., Ploubidis, G., De Stavola, B., Simonoff, E., & Treasure, J. (2014). Frequency and patterns of eating disorder symptoms in early adolescence. *Journal of Adolescent Health*, 54(5), 574-581. <https://doi.org/10.1016/j.jadohealth.2013.10.200>
- Nicholls, D., & Barrett, E. (2015). Eating disorders in children and adolescents. *BJ Psych Advances*, 21(3), 206-216. <https://doi.org/10.1192/apt.bp.114.014068>
- Raich, R. M., Mora, M., Soler, A., Ávila, C., Clos, I., & Zapater, L. (1996). Adaptación de un instrumento de evaluación de la insatisfacción corporal. *Clínica y Salud*, 7(1), 51-66.
- Rodríguez-Sacristán, J., Cadorze, D., Rodríguez, J., Gómez-Añón, M. L., Benjumea, P., & Pérez, J. (1984). Sistemas objetivos de medida: experiencia con el Inventario Español de Depresiones Infantiles (CEDI). Modificado de Kovacs y Beck. *Revista de Psiquiatría Infanto-Juvenil*, 3, 65-74.
- Rohde, P., Stice, E., & Marti, C. N. (2015). Development and predictive effects of eating disorder risk factors during adolescence: Implications for prevention efforts. *International Journal of Eating Disorders*, 48(2), 187-198. <https://doi.org/10.1002/eat.22270>
- Schag, K., Schönleber, J., Teufel, M., Zipfel, S., & Giel, K.E. (2013). Food-related impulsivity in obesity and Binge Eating Disorder – a systematic review. *Obesity Reviews*, 14(6), 477-495. <https://doi.org/10.1111/obr.12017>
- Schmidt, R., Tetzlaff, A., & Hilbert, A. (2015). Perceived expressed emotion in adolescents with binge-eating disorder. *Journal of Abnormal Child Psychology*, 43(7), 1369-1377. <https://doi.org/10.1007/s10802-015-0015-x>
- Skinner, H. N., Haines, J., Austin, S. B., & Field, A. E. (2012). A prospective study of overeating, binge eating, and depressive symptoms among adolescent and young adult women. *Journal of Adolescent Health*, 50(5), 478-483. <https://doi.org/10.1016/j.jadohealth.2011.10.002>
- Smink, F. R. E., van Hoeken, D., Oldehinkel, A. J., & Hoek, H. W. (2014). Prevalence and severity of DSM-5 eating disorders in a community cohort of adolescents. *International Journal of Eating Disorders*, 47(6), 610-619. <https://doi.org/10.1002/eat.22316>
- Sonneville, K. R., Horton, N. J., Micali, N., Crosby, R. D., Swanson, S. A., Solmi, F., & Field, A. E. (2013). Longitudinal associations between binge eating and overeating and adverse outcomes among adolescents and young adults: does loss of control matter? *JAMA Pediatric*, 167(2), 149-155. <https://doi.org/10.1001/2013.jamapediatrics.12>
- Spielberg, C. D. (1973). *Inventario de Ansiedad Estado-Rasgo para niños, STAIC*. Consulting Psychologists Press.
- Swanson, S. A., Crow, S. J., Le Grande, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents: results from the

national comorbidity survey replication adolescent supplement. *Archives General Psychiatry*, 68(7), 714-723. <https://doi.org/10.1001/archgenpsychiatry.2011.22>

Tanofsky-Kraff, M., Goossens, L., Eddy, K. T., Ringham, R., Goldschmidt, A., Yanovski, S. Z., Braet, C., Marcus, M. D., & Wilfrey, D. E. (2007). A multisite investigation of binge eating behaviors in children and adolescents. *Journal of Consulting and Clinical Psychology*, 75(6), 901-913. <https://doi.org/10.1037//0022-006X.75.6.901>

Thornton, L. M., Watson, H. J., Jangmo, A., Welch, E., Wiklund, C., von Hausswolff-Juhlin, Y. Et al (2017). Binge-eating disorder in the Swedish national registers: somatic comorbidity. *International Journal of Eating Disorders*, 50, 58-65. <https://doi.org/10.1002/eat.22624>

Touchette, E., Henegar, A., Godart, N. T., Pryor, L., Falissard, B., Tremblay, R. E., & Côté, S. M. (2011). Subclinical eating disorders and their comorbidity with mood and anxiety disorders in adolescent girls. *Psychiatry Research*, 185(1-2), 185-192. <https://doi.org/10.1016/j.psychres.2010.04.005>

Yiu, A., Murray, S. M., Arlt, J. M., Eneva, K. T., & Chen, E. Y. (2017). The importance of body image concerns in overweight and normal weight individual with binge eating disorder. *Body Image*, 22, 6-12. <https://doi.org/10.1016/j.bodyim.2017.04.005>

Copyright: Submission of a manuscript implies that the work described has not except in the form of an abstract or as part of a published lecture, been published before (or thesis) and it is not under consideration for publication elsewhere; that when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher.
