

The periodical research on the experiences of the college students with ADHD: A mixed study

(Dikkat eksiliği ve hiperaktif olan üniversite öğrencilerinin deneyimleri üzerine dergi çalışmaları:
Bir çoklu çalışma)

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Abstract

To explore the content of the papers on the experiences of college students with ADHD and its implications as a mixed study, complementing recent related studies as there have not been any review of the research in response to concerns about small number of studies in this field in the light of North's New Institutional Theory. The sample consisted of 88 papers in this field based on the Web of Knowledge and other databases. Results: There were 36 papers on the adjustment, 11 papers on the career development, 8 papers on the personality, 6 papers each on the identity management, learning behavior, and relationships of these students. There were also 15 papers in other 8 topical areas. These papers provided a context for the stimulation of the future research in these dynamic areas with a focus on the under-researched areas for the key stakeholders.

Keywords: ADHD, attention-deficit hyperactivity disorders, reviews, scientometric analysis, college students, experiences.

Özet

North'un Kuralsal kuramı çerçevesinde dikkat eksiliği ve hiperaktif olan üniversite öğrencilerinin deneyimleri üzerine yapılmış dergi yayınlarını araştırmak, bu şekilde bu alanda yapılmış çok az çalışma olduğu yolundaki endişeleri dikkate almak ve bu alanda yapılmış son yıllardaki çalışmalarını dikkate almak. Web of Knowledge ve diğer araştırma veri tabanları üzerinde çalışılarak 88 dergi yayınına erişilmiştir. Belli başlı çalışma alanları olarak düzenlemeler (36 çalışma), mesleki gelişim (11 çalışma), kişilik (8 çalışma), kimlik yönetimi, öğrenme davranışları ve diğer öğrenciler ile ilişkiler (her biri 6 çalışma) ön plana çıkmaktadır. Diğer 8 küçük alanda da 15 dergi yayını yapılmıştır. Bu çalışmada ele alınan 88 dergi yayını gelecekte bu dinamik çalışma alanlarında akademik çalışmalar için bir temel oluşturmaktadır. Gelecekteki çalışmaların az araştırılmış alanlarda yoğunlaşması beklenmektedir.

Anahtar kelimeler: ADHD, dikkat eksikliği ve hiperaktivite, derlemeler, bibliyometrik analiz, üniversite öğrencileri, deneyimler

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1. INTRODUCTION

1.1. The importance of the research on the experiences of college students with ADHD

The public importance of the research on the experiences of college students with ADHD has been well established with the increasing progression of these students into higher education (e.g., DuPaul et al., 2009, Green & Rabiner, 2012, Rabiner et al., 2008, Weyandt & DuPaul, 2006, 2008). This research interest has been in accordance with the research on the college students with other types of disabilities (Konur, 2000, 2002a-b, 2006a-b, 2007, 2011b, 2012e-f,h-i,k) as well as with the experiences of these students cited in the legal proceedings (e.g. *Brief v. Albert Einstein College of Medicine*, 2011, *Halpern v. Wake Forest University Health Sciences*, 2012, *Kaltenberger v. Ohio College of Podiatric Medicine*, 2009, Konur, 2000, 2002a-b, *Love v. Law School Admission Council*, 2007, *Price v. National Board of Medical Examiners*, 1997).

1.2 The importance of the scientometric research

There has been a significant interest in the research community in general to evaluate the research activities through the use of the scientometric methods (e.g. Baldwin et al, 2003, Clement et al., 2003, Figueira et al., 2007, Konur, 2011a, 2012a-d,f-k, Lopez-Munoz, 2003, 2006, 2008a-b, Nieminen & Isohanni, 1997, Theander & Wetterberg, 2010, West & McIlwaine, 2002). These methods have been complementary to the other methods of research evaluation such as literature reviews, meta-analyses, and content analyses among others (Hsieh & Shannon, 2005, Mulrow, 1994, Rosenthal & DiMatteo, 2001).

1.3 Issues

There have been a number of studies applying scientometric methods in the field of Psychiatry in a variety of contexts and for a variety of mental disorders as well as for a number of geographies (e.g. Baldwin et al, 2003, Clement et al., 2003, Figueira et al., 2007, Konur, 2012h, Lopez-Munoz, 2003, 2006, 2008a-b, Nieminen & Isohanni, 1997, Theander & Wetterberg, 2010, West & McIlwaine, 2002).

Despite the increasing importance of the research on the experiences of college students with ADHD as well as the scientometric research, separately, there has not been any review of the research on the experiences college students with ADHD based on all the relevant papers for the period from 1980 to 2013, complementing recent scientometric and evaluative studies of the college students with ADHD and general ADHD research as of July 2013 (Konur, 2012h, 2013a-c, Lopez-Munoz et al. 2008a).

Therefore, the aim of this paper to review all the relevant papers on the experiences of college students with ADHD published between 1980 and 2013 based on the Web of Knowledge as well as other databases such as Google Scholar, ERIC, Scopus, and PsycInfo to identify the main trends and issues in this field, as the first ever study of its kind in this field to provide helpful insights into the incentive structures for all the key stakeholders in the field following North's New Institutional Theory (North, 1991, Konur, 2000, 2002a-b, 2006a-b, 2007, 2012e).

2. METHODS AND MATERIALS

A search was carried out in the Web of Knowledge (v.5.11) (SCIE, SSCI, and A&HCI) of the Thomson Scientific Inc. for the period from 1945 to 2013, in July 2013. These indices have become the gold standard as the key instruments for the scientometric analysis (e.g. Konur 2011a-b, 2012a-k). The traditional methods of scientometric research as applied in many scientific fields were applied in this study.

The search term set used was [TOPIC=(adhd OR "ad/hd" or "attention* deficit*" or hyperactivity) AND

(student* or faculty) AND (college* or university* or postsecondary or “post-secondary” or “higher education” or preservice or “pre-service” or undergraduate*]). The found references were refined using the search term set of [Document Types=(ARTICLE OR REVIEW)]. Around 400 references were found for this search strategy. It is clear that this piece of study is sensitive to the use of these keywords in the abstract pages of the papers.

Additionally, a number of other databases such as the Google Scholar, ERIC, PsycInfo, and Scopus were searched using the similar keyword set to locate the key papers not indexed by the Web of Knowledge. A significant number of papers were located in this way bearing in mind the concerns expressed about the small number of studies on college students with ADHD (DuPaul, 2009, Green & Rabiner, 2012, Weyandt & DuPaul, 2006, 2008).

It should be further noted that the results of this piece of study is also sensitive to the differences in institutional subscriptions to the Web of Science and Web of Knowledge as well as the timing of the search (e.g. Konur 2011a-b, 2012a-k).

Next, a citation analysis was carried out using the “create citation report” tool of the Web of Knowledge database (e.g. Konur 2011a-b, 2012a-k). Then, the papers were grouped under the topical headings and a short abstract for each paper was provided based on their published abstracts, collected from a number of databases such as the publisher databases.

The topics related to the diagnostic assessment, the prescription stimulant use, services, academic achievement, transition, medical treatment, training, attitudes, additional mental disorders, faculty, and graduates were not included in this study (Konur, 2012h, 2013a-c). Especially, as the papers on the academic achievement of college students with ADHD merited another study due to its significant public policy aspects, the relevant papers were not included in this study bearing in mind concerns expressed about the small number of studies (DuPaul, 2009, Green & Rabiner, 2012, Weyandt & DuPaul, 2006, 2008). Similarly, doctoral theses on the experiences of college students with ADHD merited another study, complementing this study (Konur, 2012h, 2013a-c). These theses provided rich data and formed the basis for many scholarly papers later on.

3. RESULTS AND DISCUSSION

3.1 The outline of the research on the experiences of college students with ADHD

There were 88 papers grouped under 14 topical headings (Table 1). The topical areas were listed in the order of the increasing name of the topical areas. The information related to paper year range and paper citation range is also provided in this summary table.

The adjustment college students with ADHD (36 papers), career development (11 papers), personality (8 papers), identity management, learning behavior, and relationships (6 papers each), and self-esteem of these students (4 papers) were the major topical areas. The papers under these topical headings formed 88% of the research output.

One interesting point emerging from the close reading of the data in this Table is that the research on college students with ADHD has been relatively current covering the period from 1991 to 2013. The number of citations for papers ranged from 0 to 98.

The data in this table gives valuable hints on the under-researched areas in relation to research on the experiences of college students with ADHD such as help-seeking behavior, disclosure, and self-advocacy which have been very important for these students to have access to the academic accommodations granted under the anti-discriminatory legislation.

Table 1. The outline of the research on the experiences of college students with ADHD

No.	Topical area	Paper	Paper year	Paper citation
		no.	range	range
1	Adjustment	36	1993-2013	0-31
2	Career development	11	1991-2010	0-8
3	Disclosure	1	2013	0-0
4	Health	1	2008	0
5	Help seeking	1	2010	2
6	Identity management	6	2005-2012	0-4
7	Learning behavior	6	2002-2010	0-19
8	Life satisfaction	2	2002-2009	7-18
9	Other learning disabilities	2	2008-2009	6-9
10	Personality	8	1993-2013	0-98
11	Relationships	6	2003-2012	0-14
12	Retrospective adjustment	3	2005-2010	0-5
13	Self-advocacy	1	2011	0-0
14	Self-esteem	4	1997-2013	0-8
		88	1991-2013	0-98

3.2. The adjustment of college students with ADHD

There were 36 papers on the adjustment of college students with ADHD showing the importance of this topical area in this field.

Papers were dominated by the researchers from the US with 30 papers usually through the intra-country institutional collaboration and they were multi-authored. There were also 4 papers from Canada. Similarly, 17 papers were published in journals indexed by SSCI whilst 13 and 2 papers were indexed by SCIE and SCI, respectively. However, it is notable that 17 papers were not indexed at all by these indices. The number of citations ranged from 0 to 37 and the average number of citations per annum ranged from 0.0 to 5.3. Only 3 papers were reviews.

14 of these papers were published in Journal of Attention Disorders where only 10 of them were indexed by SCIE and SSCI. There were also 6 papers published by the non-indexed Journal of Postsecondary Education and Disability. Colorado State University and Duke University were the most prolific institutions with 3 papers each. One interesting issue is the fact that the first authors of 28 papers were female showing the gender surplus in this field. Similarly, in terms of the first authors, Weyandt, Richards, and Waite were the most prolific authors.

Weyandt & DuPaul (2006) review articles to summarize the major research findings concerning college students with ADHD with a focus on the prevalence of symptoms, neuropsychological and psychological functioning. Overall, they find that these students are at greater risk for academic and psychological difficulties, and perform similar to their peers on many neuropsychological tasks.

Heiligenstein & Keeling (1995) review charts of 42 college students with ADHD at a university. They find that problems encountered by these students included ADHD symptoms, mood symptoms, nonspecific learning disability, and academic underachievement. Associated problems were depressive disorders, anxiety disorders,

drug and alcohol abuse or both, dependency, legal problems, learning disabilities, and eating disorders.

DuPaul et al. (2009) note that approximately 2 to 8% of the college population reports clinically significant levels of ADHD symptomatology and at least 25% of college students with disabilities are diagnosed with ADHD. They find that academic deficits are associated with ADHD in college students with less evidence on the impact of the ADHD in the areas of social, psychological, and neuropsychological functioning in the literature.

Rabiner et al. (2008) examine college adjustment in students reporting an ADHD diagnosis and the effect of medication treatment on students' adjustment based on a sample of 1,648 first-semester freshmen. They find that compared with 200 randomly selected peers, 68 students with ADHD reported more academic concerns and depressive symptoms.

Richards et al. (2002) examine differences between college students with high and low symptoms of ADHD based on a sample of 59 introductory psychology students (35 males and 24 females). They find that high ADHD symptom college students experience more driving anger, display such anger in more hostile/ aggressive ways, are more aggressive and risky on the road, experience more crash-related outcomes, are more generally angry, and tend to display anger in socially unacceptable ways.

Shaw-Zirt et al. (2005) assess several aspects of college adjustment, social skills, and self-esteem in a non-referred sample of college students meeting criteria for a DSM-IV diagnosis of ADHD based on a sample of 21 undergraduate students with symptoms of ADHD and 20 peers. They find that students with ADHD symptoms show decreased functioning in several areas of college adjustment as well as lower levels of self-reported social skills and self-esteem.

Ramirez et al. (1997) examine differences in anger and anger expression between 29 college students high in symptoms of ADHD and 146 non-ADHD college students in one of the earliest papers. They find that the ADHD group exhibited significantly higher levels of trait and state anger, more dysfunctional and socially inappropriate ways of expressing anger, as well as more symptoms of psychological distress, more difficulty in interpersonal relations, more high school truancy, and more labile anxious/depressed moods than the non-ADHD group.

Richards et al. (2006) assess whether anger in the context of driving is associated with the negative driving outcomes experienced by individuals with ADHD based on a sample of 56 adults with ADHD. They find that ADHD participants reported more driving anger and aggressive expression through the use of their vehicle and less adaptive and constructive anger expression than their non-ADHD peers.

Blase et al. (2009) examine the association between self-reported ADHD and college adjustment on sample of 4,246 undergraduates. They find that relative to their peers, those with self-reported ADHD had lower GPAs and reported more academic concerns, depressive symptoms, social concerns, emotional instability, and substance use.

Lewandowski et al. (2008) examine self-reported ADHD symptoms and academic complaints in college students based on a sample 38 college students with ADHD and 496 peers. They find that students with ADHD reported significantly more ADHD symptoms and academic concerns, but none of the 18 symptoms or 6 concerns was both sensitive and specific to ADHD.

Weyandt & DuPaul (2008) summarize major research findings concerning developmental issues facing college students with ADHD. Overall, they find that college students with ADHD are at greater risk for academic and psychological difficulties in relation to their peers, and misuse of prescription stimulants becomes a significant problem.

Turnock et al. (1998) investigate differences in academic coping strategies of college students who self-report high and low symptoms of ADHD based on a survey of 151 university undergraduates in one of the earliest studies. They find that students who self-reported high symptoms of ADHD used significantly fewer academic coping behaviors than their low-symptom peers.

Kolanko (2003) describes the meaning of being a nursing student with a learning disability (LD) and ADHD and examines how undergraduate nursing students with LD and ADHD experienced various aspects of the nursing program based on a sample 7 nursing students with ADHD and LD. She finds five emerging themes: struggle, learning how to learn with LD, issues concerning time, social support, and personal stories. She then finds that students had average to above average intellectual functioning.

Meaux et al. (2009) determine factors that help, as well as hinder, college students with ADHD as they learn to cope with everyday challenges of life and college once they leave the structure and support of their parents' home with a sample of 15 college students with ADHD. They identify three global themes: gaining insight about ADHD, managing life and utilizing sources of support.

Norvilitis et al. (2010) examine ADHD symptomatology and college adjustment in 420 students (147 from the United States and 273 from China). They hypothesize that higher levels of ADHD symptoms in general and the inattentive symptom group in particular would be related to reduced academic and social adjustment, career decision-making self-efficacy, and poorer study skills in both countries. Their results generally supported the hypotheses, indicating that the difficulties associated with inattention are cross-cultural and not specific to the United States.

Green & Rabiner (2012) review research on the college students with ADHD. They find that college students with ADHD experience less academic success and greater psychological and emotional difficulties than other students and use alcohol and drugs at higher rates. However, conclusions to be drawn from this research are limited by the use of small samples and a lack of diagnostic rigor in identifying students with ADHD.

Perry & Franklin (2006) explore how undergraduate students diagnosed with ADHD remain in college based on sample 10 students. They find themes related to attitudes about their diagnosis, adapting to college, and recommendations for students, college personnel, and parents.

Abramovitch & Schweiger (2009) examine two symptoms associated with cognitive disinhibition, namely: intrusive unwanted thoughts, worrisome thoughts and their suppression based on a sample 37 college students with ADHD and 23 peers. They find that students with ADHD experienced significantly higher ratings on all intrusive thoughts scales, and three worrisome thoughts scales in relation to their peers.

Nielsen (1997) investigates university students' perceptions of their learning disabilities (LDs and ADHD) and how the disabilities have affected them based on the sample of students who used support services at the college. She finds that the perceived worst negative academic and social effects of the LD and ADHD were as individual as the students, but related directly to the specific LDs.

Willis et al. (1995) explore experiences of 5 college students with ADHD, their family members, and personnel from the support team of the Disabled Student Services program at a university in one of the earliest studies. They develop five clinical vignettes representing a spectrum of college students with ADHD.

Buchanan (2011) explores psychological well-being of 317 college students with ADHD. He finds that students with self-reported ADHD had lower scores on total well-being, environmental mastery, personal growth, and purpose in life.

Dwyer (2000) explores the experience of 8 women Canadian university students with ADHD. She finds

that two themes describe obstacles to their education - "robbed of time" and "thoughts like a rubber ball".

Erten (2011) examines the perspectives of students with disabilities studying at a Canadian college based on a sample of 7 female students with 5 students with LD and ADHD. She finds that both individual characteristics, such as disability-specific needs, and contextual factors, including attitudes of faculty members and peers were barriers affecting students' full participation to university life.

Field et al. (2013) examine the effects of coaching on learning and study skills, self-regulation, and subjective well-being of students with ADHD attending 2- and 4-year colleges or universities. They find that the coaching group had a statistically significant higher total LASSI score and statistically significant higher scores on all three LASSI clusters (i.e., Skill, Will, and Self-Regulation) than the comparison group.

Inegboh (2008) discusses the experiences of two gifted students with ADHD enrolled in an English course at a Nigerian university. These students have had their barriers to learning overcome and they are now able to adapt and enjoy their studies with institutional support.

Jones et al. (2013) examine relationships among parenting style, symptoms of ADHD, and academic adjustment in college students based on a sample of 200 undergraduate students. They find small but significant moderation effects for authoritarian parenting and authoritative parenting on the relationship between ADHD symptoms and academic adjustment.

Kearnes & Ruebel (2011) explore relationships between negative emotion and ADHD based on a sample of 64 college students with ADHD and 109 peers. They find that regardless of gender, students with an ADHD, Combined Type diagnosis reported significantly more negative emotion compared to students with no diagnosis.

Mullins & Preyde (2013) explore experiences of Canadian university students with invisible disabilities (dyslexia, ADHD, and mental illness). The common themes were related to the nature of the disability, the accessibility of the university context, the social and organizational barriers, and recommendations for change.

Mytkovicz & Goss (2012) explore experiences of 14 undergraduates with LD and/or ADHD. Students reported growth in self-authorship and self-determination, greater meta-cognitive awareness, improved academic skills, and changes in their perceptions of themselves as learners and their learning differences.

O'Callaghan & Sharma (2012) examine the severity of ADHD symptoms and related quality of life in 33 1st and 2nd year medical students with ADHD. They find that students' ADHD-related quality of life and life productivity were negatively correlated with the severity of their ADHD symptoms.

Parker et al. (2013) identify undergraduates' perceptions of the impact of ADHD coaching on their academic success and broader life functioning based on a sample of 19 students. They find that ADHD coaching helped students become more self-regulated, which led to positive academic experiences and outcomes.

Prevatt et al. (2012) explore how anxiety impacts 473 college students with ADHD, especially with regard to cognitive functioning in relation to 200 peers. They find that students with ADHD reported significantly more anxiety than their peers. Within the ADHD group, the relationship between anxiety and inattention was similar to the relationship between anxiety and hyperactivity/impulsivity. Students with ADHD reported more anxiety with regard to academic issues compared to life-in-general.

Strickland (1993) shares her experiences as a college sophomore with ADHD. She was taken off Ritalin at age 14 and attempted suicide and she was currently studying to become a community service aide in a Community College.

Waite & Ramsay (2010) examine how a Hispanic woman with ADHD managed social, academic, interpersonal, and familial roles. They find that there is a gap in early diagnosis and treatment for some women and

individuals from ethnic minority and diverse groups.

Waite & Tran (2010b) explore the experience of 16 college women with ADHD. They find three emerging themes: internalized chaos, cultivation of self-understanding, and commitment to building capacity. Co-morbid psychological disorders (e.g., major depression and anxiety) among women with ADHD were associated with increased impairment.

Weyandt et al. (2013) examine differences in neuropsychological, academic, psychological and social functioning between college students with ADHD and their peers. They find statistically significant group differences in the areas of executive functions, attention, internalizing and externalizing disorders, emotional expression, academic performance, study/organizational skills, and social adjustment.

3.3. The career development experiences of college students with ADHD

There were 11 papers on the career development experiences of college students with ADHD showing the importance of this topical area in this field. The papers were dominated by the researchers from the US in all papers, usually through the intra-country institutional collaboration and they were multi-authored. However, there was also collaboration with Australian institutions in 4 papers.

Most of the papers (8 papers) were not indexed by SCI, SCIE, or SSCI showing the need for the population coverage of the research in this field whilst 3 papers were published in indexed journals (SSCI:3, SCIE:2, SCI:1). There were no papers indexed by the A&HCI.

The number of citations ranged from 0 to 8 and the average number of citations per annum ranged from 0.0 to 1.8. All of the papers were articles as there were no reviews in this field.

There was no journal concentration in this field as each paper was published by different journals whilst Griffith University, Florida State University, and Central Washington University were the most prolific institutions.

One interesting issue is the fact that the first authors of 8 papers were female showing the gender surplus in this field as in the field of the adjustment noted above. In terms of the first authors, Coetzer and Trimble were the most prolific authors.

Painter et al. (2008) evaluate dysfunctional career beliefs and subsequent low job satisfaction in adults reporting significant symptoms of ADHD based on a sample of 81 college students with ADHD. They find that ADHD symptoms were significantly predictive of dysfunctional career beliefs, decision-making confusion, commitment anxiety, and external conflict.

Shifrin et al. (2010) examine the difference between college students with ADHD and their peers in relation to their work performance. They find that ADHD has a detrimental impact on the work performance of college students in multiple areas. Severity of symptoms was unrelated to number of times fired from a job and the overall indicator of work performance.

Greenspan et al. (1991) examine the relationship between social competence and work success in 45 college students with learning disabilities (LD) and ADHD. They find that students with high ratings on social competence were more likely to have earned over \$6 per hour and to have worked on a non-hourly basis, and were less likely to have had difficulty finding a job whereas students with ADHD had low social competence and marginal work histories.

Coetzer & Trimble (2009a) explore relationships between ADHD, role stress, and self-efficacy. They find that the correlations between ADHD and both role stress and self-efficacy were statistically significant, as was the

correlation between role stress and self-efficacy. Role stress mediates the relationship between AAD and self-efficacy.

Coetzer & Trimble (2009b) examine the impact of adult ADHD on team members and the relationships between team members based on a sample of 304 management students. They find that ADHD interferes with the ability to perform necessary tasks and constrains the achievement of a general sense of independence.

Canu (2007) explores the preferences of a group of male college students with ADHD for the vocational choice. He finds that students with ADHD-predominantly inattentive type (ADHD-IA) reported placing less emphasis on job safety than did their peers when considering their professional direction.

Coetzer & Richmond (2009) explore link between ADHD and role stress in the employment context. They find that adults who are experiencing the core symptoms of ADHD are less likely to develop an effective task management system. Both the association between ADHD and total role stress, and the more specific associations between ADHD and role overload, role ambiguity and role conflict, were statistically significant.

Coetzer & Trimble (2010) examine the difficulties encountered by college students with ADHD in teamwork during their employment based on a sample of 155 student teams with 628 college students in both Canada and the United States. They find that team members with ADHD have relatively greater difficulty with necessary but uninteresting tasks and team members with ADHD will be extraordinarily reliant on their teammates.

Fried et al. (2012) examine specific deficiencies associated with ADHD on workplace performance in a simulated workplace laboratory based on a sample of 56 college students with ADHD and 63 peers. They find statistically significant differences on self-report of ADHD symptoms between participants with ADHD and peers during all workplace tasks and periods of the workday.

Hennessey et al. (2006) examine the career development concerns of college students with learning disabilities (LD) and ADHD based on a sample of 110 students with LD and ADHD. They find that students' main employment-related strengths were in regard to expectations, access and accommodations, and job-seeking and technical skills.

Tomevi & Landrum (2012) expand on previous research regarding college students with ADHD to understand how the symptoms of ADHD influence college students' future plans for careers.

3.4 The personality of the college student with ADHD

There were 8 papers on the personality of college students with ADHD showing the importance of this topical area in this field. The papers were dominated by the researchers from the US, England, and Iceland, usually through the intra-country institutional collaboration and they were multi-authored. However, there was also collaboration with English and Icelandic institutions in 3 papers.

Most of the papers (6 papers) were not indexed by SCI, SCIE, or SSCI whilst 3 papers were published in indexed journals (SSCI:6, SCIE:2, SCI:0, A&HCI:0). The number of citations ranged from 0 to 98 and the average number of citations per annum ranged from 0.0 to 8.9. All of the papers were articles as there were no reviews in this field.

There was limited journal concentration in this field as each paper was published by different journals with the exception of *Personality & Individual Differences* (2 papers). Papers were usually published in Psychology journals. King's College and University of Iceland were the most prolific institutions.

One interesting issue is the fact that the first authors of 6 papers were male showing the gender deficit in this field. In terms of the first authors, Gudjonsson was the most prolific author.

Nigg et al. (2002) explore how ADHD symptoms relate to normal personality traits in 1,620 adults. They find that first, the ADHD symptom cluster of inattention-disorganization was substantially related to low conscientiousness and, to a lesser extent, neuroticism. Second, ADHD symptom clusters of hyperactivity-impulsivity and oppositional childhood and adult behaviors were associated with low agreeableness.

Shaw & Giambra (1993) examine the relationships between task-unrelated thoughts (TUTs) and self-reported sensation seeking in college students with childhood ADHD in one of the earliest papers. They find that left-eye dominance was related to increased childhood hyperactive behaviors and to spontaneous TUTs.

Parker et al. (2004) examine the relationship between ADHD symptoms and basic personality in a large sample of adults (122 men and 465 women). They find that collectively, the five scales on the NEO-FFI accounted for substantial amounts of variability in ADHD symptoms.

Kern et al. (1999) investigate the relationship between lifestyle personality attributes in 117 college students with ADHD. They find that the students with ADHD exhibit behaviors that are independent, less rule-focused, and more confrontative toward others.

Gudjonsson et al. (2006) investigate the relationship between self-reported offending and personality based on a sample of a total of 1,603 college students. They find that overall, the Gough Socialisation Scale and EPQ psychoticism contributed most to the variance in self-reported offending.

Gudjonsson et al. (2010) investigate the relationship between symptoms of ADHD and core maladaptive personality problems based on a sample of 397 college students. They find that inattention was a much better predictor of the responsibility domain than hyperactivity/impulsivity.

Gudjonsson et al. (2013) investigate the relative importance of ADHD symptoms, mood instability, and antisocial personality disorder traits in predicting self-reported offending based on a sample of 295 college students. They find that self-reported offending from the two independent scales correlated significantly with ADHD symptoms, mood instability, and antisocial personality traits with medium to large effect size.

Schneider et al. (2005) explore the personality of 52 undergraduate students. They find that males scored significantly higher on the WURS than did females whilst higher WURS scores in males were associated with externalizing features, including impulsivity and oppositional personality styles.

3.5 The identity management in college students with ADHD

There were 6 papers on the identity management of college students with ADHD. The papers were dominated by the researchers from the US and Canada usually through the intra-country institutional collaboration and they were multi-authored.

Three papers were not indexed whilst three papers were published in indexed journals (SSCI:3, SCIE:2, SCI:1, A&HCI:0). The number of citations ranged from 0 to 4 and the average number of citations per annum ranged from 0.0 to 1.0. All of the papers were articles as there were no reviews in this field. There was no journal concentration in this field as each paper was published by different journals by different institutions.

One interesting issue is the fact that all of the first authors were female showing the gender surplus in this field like some other fields noted above. In terms of the first authors, Loe and Cuttino were the most prolific authors.

Loe & Cuttino (2008, 2012) present a case study of the "medicated self" with a focus on how college students with ADHD construct how they are shaped by the behavioral effects of medicine. They find that students practice concerted medicalization in an attempt to literally embody the academic ideal.

Gajaria et al. (2011) examine what college students think about having ADHD by collecting data in Facebook groups with "ADHD" in the title. They find that the dominant theme concerned the collective construction of a positive group identity. Many jokes referencing ADHD stereotypes were posted.

Davis-Berman & Pestello (2010) explore medication experiences of 20 college students with ADHD and find that themes of recruitment of the young, little personal stigma, societal issues, side effects and abuse are relevant.

Olney & Brockelman (2005) explore the identity management in 25 university students with a variety of disabilities. They find themes related to self-concept as specifically how the students thought of themselves, presented themselves to others, imagined others' views of them, and perceived the supports they received.

Shames & Walden (2005) explore the identity changes that 13 college students with LD and/or ADHD report after participating in a short-term study abroad program. They focus on the ways in which these identity changes impacted the students as learners and the factors unique to short-term study abroad that facilitated those identity changes. They propose a model of identity development for students with LD and/or ADHD.

3.6 The learning behavior of college students with ADHD

There were 6 papers on the learning behavior of college students with ADHD. The papers were dominated by the researchers from the US usually through the intra-country institutional collaboration and they were multi-authored.

Only 2 papers were indexed (SSCI:2). The number of citations ranged from 0 to 19 and the average number of citations per annum ranged from 0.0 to 2.1. All of the papers were articles as there were no reviews in this field. There was no journal concentration in this field as each paper was published by different journals by different institutions.

One interesting issue is the fact that all of the first authors were female showing the gender surplus in this field like some other fields noted above. Unusually, in terms of the first authors, Christensen was the most prolific author.

Hecker et al. (2002) investigate how assistive reading software affected the reading performance of a group of 20 college students with ADHD. They find that the assistive software allowed the students to attend better to their reading, to reduce their distractibility, to read with less stress and fatigue, and to read for longer periods of time. It helped them to read faster and, thereby, to complete reading assignments in less time.

Reaser et al. (2007) explore learning and study strategies of students with ADHD in relation to those with LD and peers. They find that several important differences may exist in the learning and study strategies of students with ADHD versus students with LD and peers.

Alban-Metcalf (2002) investigates the relationship between characteristics associated with ADHD and learning style among first-year undergraduate students. Three hypotheses were proposed about the relation between ADHD-type characteristics and a 'deep', an 'achieving', and a 'surface' approach to learning.

Prevatt et al. (2007) explore the study techniques of college students with ADHD and LD in relation to their peers. Finally, they determine if study strategies are predictive in students with ADHD, students with learning disabilities, and normal controls.

Christensen (2008) examines the perceptions of law students with ADHD about their law school experience. She finds four themes relating to the social, learning and achievement domains of the students. First, these students experienced feelings of isolation in law school; second, the more successful students understood

their personal learning styles whereas the less successful student students did not; third, the Socratic Method as the predominant teaching methodology inhibited students' learning in the classroom; and fourth, the students expressed feelings of uncertainty about their future careers as practicing lawyers with ADHD.

Christensen (2010) examines how three law students with ADHD read a judicial opinion. She finds a relationship between successful law school performance and the use of problematizing and rhetorical reading strategies; and less successful law school performance and the use of default reading strategies..

3.7 The interpersonal relationships of college students with ADHD

There were 6 papers on the relationships of college students with ADHD. The papers were dominated by the researchers from the US usually through the intra-country institutional collaboration and they were multi-authored.

Journal of Attention Disorders was the most prolific journal whilst only 4 of these papers were indexed by SSCI and SCIE. The number of citations ranged from 0 to 14 and the average number of citations per annum ranged from 0.0 to 1.6. All of the papers were articles as there were no reviews in this field.

One interesting issue is the fact that only a half of the first authors were female showing the gender balance in this field. In terms of the first authors, Canu and Carlsson were the most prolific authors.

Canu & Carlson (2003) explore hetero-social relational outcomes in terms of dating, sexual, and social outcomes in college students with ADHD based on a sample of students with 27 ADHD-Combined (ADHD/C) Type, and 13 ADHD-Primarily Inattentive (ADHD/IA) Type and 24 peers. They find that the ADHD/IA group showed a consistent pattern of passivity and inexperience and was perceived relatively negatively by female students, whereas the ADHD/C group reported increased sexual drive and early dating experience.

Canu & Carlson (2007) investigate whether elevated rejection sensitivity (RS) could contribute to the relational problems that adults with ADHD encounter based on a sample of undergraduate men in (31 ADHD-Combined Type (ADHD-C), 22 ADHD-Primarily Inattentive Type (ADHD-IA) and 25 peers (NC)). They find that those with ADHD did not have elevated RS in relation to their peers.

Overbey et al. (2011) examine how the subclinical symptoms of adult ADHD and those of oppositional-defiant disorder (ODD) affect relationship satisfaction and stress. They find that ADHD and ODD symptoms are significantly related to a number of stressors and different patterns of coping strategies. University students with symptoms of both ADHD and ODD display a different pattern of stressors and different patterns of coping than those with symptoms of ADHD only.

Frederick (2012) explores the effect of birth weight on the intimate relationships of college students with ADHD based on a sample of 50 college men. He finds that lower birth weights were associated with higher scores on the ADHD scale and more favorable attitudes towards casual sex. There was a significant interaction between birth weight and casual sex favorability in predicting number of sexual partners.

Huggins et al. (2012) examine the extent to which ADHD was associated with risky sexual behaviors (RSBs) in a sample of 44 undergraduates with ADHD and 48 peers. They find that female students with ADHD were least likely to use condoms than males overall and females without ADHD.

Marsh et al. (2012) examine the relationship between ADHD symptomatology and fear of intimacy, sexual anxiety, and sexual behavior in college students based on a sample of 300 Chinese and 233 American college students. They find that Chinese students with more ADHD symptoms did not report lower levels of sexual anxiety but did report greater fear of intimacy. The US students partially replicated the results of the Chinese study,

reporting greater fear of intimacy in those with more symptoms of ADHD.

3.8 The self-esteem of college students with ADHD

There were 4 papers on the self-esteem of college students with ADHD. The papers were dominated by the researchers from the US usually through the intra-country institutional collaboration and they were multi-authored.

Two papers were published in an indexed journal whilst two others were not indexed. The number of citations ranged from 0 to 8 and the average number of citations per annum ranged from 0.0 to 1.5. All of the papers were articles as there were no reviews in this field. There was journal concentration in this field as Journal of Attention Disorders published 2 papers. One interesting issue is the fact that all of the first authors were female showing the gender surplus in this field.

Dooling-Litfin & Rosen (1997) examine differences in self-esteem between college students with childhood ADHD and their peers. They find significant differences in self-esteem between the college students self-identified as ADHD and their peers even when gender, SES, and aptitude test scores were taken into account.

Getzel & Thoma (2006) explore the importance of self-determination on their success among college students with disabilities (40% of LD or ADHD). They find that self-determination skills were important for these students to their success in taking courses, finding the supports they needed, and advocating for their rights.

Wilmshurt et al. (2011) examine psychological well-being and self-concept in 17 college students ADHD and 19 peers. They find that the strongest predictors for TSC were "environmental mastery" (PWB) for the ADHD group and "positive relations with others" (PWB) for the peers. Students with ADHD reported significantly higher paternal support than controls who reported significantly greater support from friends.

Nelson (2013) investigates the self-concept of college students with ADHD. He finds that these students did not report problems with self-concept but their parents did for them.

3.9 The retrospective adjustment of college students with ADHD

There were 3 papers on the retrospective adjustment of college students with ADHD. The papers were dominated by the researchers from the US usually through the intra-institutional collaboration and they were multi-authored.

Two papers were indexed whilst the number of citations ranged from 0 to 5 and the average number of citations per annum ranged from 0.0 to 1.0. All of the papers were articles as there were no reviews in this field.

There was no journal concentration in this field as each paper was published by different journals by different institutions. One interesting issue is the fact that all of the first authors were female showing the gender surplus in this field. There was no concentration of authors, journals, and institutions.

Shattell & Bartlett (2008) examine the experience of childhood ADHD based on the sample of 16 college students with childhood ADHD. They find that participants revealed feelings of difference, misunderstanding, and struggle in all areas of their lives (home, school, and friendships).

Stolowitz (1995) describes as an adult, nontraditional student with LD and ADHD, enrolled in a community college, the pain of her school experiences, her quest for self-identity and personal satisfaction, and the value of drug therapy and other treatments.

Bartlett et al. (2010) determine what successful young adults perceive was helpful to them when they were struggling with their ADHD symptoms as children based on a sample of 16 college students with childhood

ADHD. They find that the most helpful people were parents and teachers; the most helpful strategies were caring behaviors and active teaching/learning strategies.

3.10 The marginal topics relating to the experiences of college students with ADHD

There were 8 papers on the marginal topics relating to the experiences of college students with ADHD. These were disclosure of ADHD, health, help-seeking behavior, life satisfaction, other learning disabilities, and self-advocacy.

The papers were dominated by the researchers from the US and England usually through the intra-country institutional collaboration and they were multi-authored.

Only 3 papers were indexed whilst the number of citations ranged from 0 to 18 and the average number of citations per annum ranged from 0.0 to 2.0. All of the papers were articles as there were no reviews in this field. There was limited journal, author, and journal concentration in this field. One interesting issue is the fact that 5 of the first authors were female showing the gender surplus in these fields.

Grenwald-Mayes (2002) examines the relationship between current quality of life, family of origin relationship dynamics, and the presence of ADHD in 37 college students with ADHD and 59 peers. She finds that the students with ADHD reported lower quality of life whilst the all students did not differ significantly in reported family of origin relationship dynamics.

Kirby et al. (2008) investigate the service needs of 21 college students with developmental co-ordination disorder (DCD) and 38 college students with additional ADHD, or autism spectrum disorders, dyslexia. They find that the DCD group higher levels of motor-related difficulties such as handwriting and also executive functioning difficulties.

Gudjonsson et al. (2009) ascertain whether ADHD symptoms, and associated problems, are negatively related to subjective well-being based on a sample of 369 college students. They find that the study variables accounted for 22% and 25% of the variance of the SWLS among males and females, respectively.

Griffin et al. (2009) explore the experiences of 27 students with a range of specific LDs and find that participants shared many life experiences and preferences for learning irrespective of their type of LD. Students generally held one of two views about their identity as 'neuro-diverse': a 'difference' view-where neuro-diversity was seen as a difference incorporating a set of strengths and weaknesses, or a 'medical/deficit' view-where neuro-diversity was seen as a disadvantageous medical condition.

Waite & Tran (2010a) explore how a diverse ethnic group of 27 college students with ADHD conceptualized their condition and how this conceptualization shaped their efforts to seek help. They find that a common explanatory model of ADHD was not shared; however, gender and age differences were apparent.

Bolton et al. (2008) assess the differences in the psychological and physical health of female college students with ADHD and their peers by testing self-reports of stress, role overload, fatigue, mental health, and optimism. They find that women with ADHD report significantly greater fatigue and role overload than their non-ADHD counterparts.

Kranke et al. (2013) investigate factors associated with students' perceptions of faculty and peers that impact these students' disclosure of their non-apparent disabilities in order to access services for academic assistance based on a sample 17 college students. They find that students make the decision to disclose to request accommodations under three conditions: fear that their disability will greatly limit functioning critical to academic achievement, the stability of their non-apparent disability, and stigma.

Lombardi et al. (2011) develop, administer, and evaluate a measure of individual actions of college students with disabilities and their perceptions of college and social supports. They find that self-advocacy explained significant unique variance in predicting grade point average, indicating that self-advocacy is most crucial for college success.

4. CONCLUSIONS

The present study reviewed 86 papers on the experiences of college students with ADHD published between 1991 and 2009 located through the Web of Knowledge and other databases such as the Google Scholar, Scopus, ERIC, and PsycInfo and its implications using the scientometric techniques, complementing 4 recent studies on the full scientometric study of college students with ADHD and 100 citations classics on college students with ADHD (Konur, 2012h, 2013a-c) in response concerns expressed about the small number of studies about college students with ADHD (DuPaul, 2009, Green & Rabiner, 2012, Weyandt & DuPaul, 2006, 2008).

It was found that there were 36 papers on the adjustment, 11 papers on the career development, 8 papers on the personality, 6 papers each on the identity management, learning behavior, and relationships of these students. There were also 15 papers in other 8 topical areas.

These papers provided a context for the stimulation of the future research in these dynamic areas with a focus on the successful participation college students with ADHD in higher education institutions, providing rich data on the experiences of these students whilst highlighting the under-researched key research areas for the stakeholders.

It is argued that the key reason for the superior performance of the US in this field has been the significant participation of students with ADHD in higher education programs following the legal mandates facilitating their participation since 1970s with the Rehabilitation Act and the Americans with Disabilities Act, enhanced by the state anti-discriminatory legislation. Canada and England have had similar anti-discriminatory laws since 1990s facilitating the participation of students with ADHD in higher education programs (e.g. Brief v. Albert Einstein College of Medicine, 2011, Halpern v. Wake Forest University Health Sciences, 2012, Kaltenberger v. Ohio College of Podiatric Medicine, 2009, Konur, 2000, 2002a-b, Love v. Law School Admission Council, 2007, Price v. National Board of Medical Examiners, 1997).

The close reading of all these studies suggest that ADHD impacts these students' academic adjustment, social adjustment, self-esteem, relationships, help-seeking behavior, identity management, self-disclosure, career development, personality, learning behavior, health, life satisfaction, retrospective adjustment, self-advocacy, and coping behavior with additional disorders such as dyslexia. Therefore, this study would likely be helpful for all the key stakeholders with interest on the participation of these students in higher education programs in providing the full picture on the experiences of these students.

The results suggest that the mixed scientometric analysis and reviews of the papers have a great potential to facilitate valuable insights into the experiences of the college students with ADHD under 13 topical areas, complementing recent scientometric and evaluative studies on the college students with ADHD providing a unique insight on the incentive structures for all the key stakeholders in the field following North's New Institutional Theory (North, 1991, Konur, 2000, 2002a-b, 2006a-b, 2007, 2012e).

This study also shows the need for the reviews and scientometric analysis of the research in other topical areas relating to the college students with ADHD especially in the under-researched social and educational areas such as services, academic achievement, transition, training, attitudes, and graduates (Konur, 2012h, 2013a-c).

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