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Short research communication

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Abstract

Background: Attention deficit hyperactivity disorder is a common neurodevelopmental disorder. Accessing services for this disorder is a worldwide challenge and requires innovative interventions.

Aims: We aimed to investigate the effectiveness of tele-collaborative care for attention deficit hyperactivity disorder in primary health care centres in Dubai.

Methods: Six trained physicians started collaborative care clinics across Dubai. Eligible children aged 6–12 years attending primary health care centres with attention deficit hyperactivity disorder were randomly selected to receive tele-health collaborative care, or standard treatment. Baseline assessments were conducted using the Vanderbilt Behavioral Assessment Scale, the Columbia Impairment Scale, the Childhood Behavior Checklist, and the Strength and Difficulties Questionnaire. Waiting times and clinical and functional outcomes were measured in both groups and compared. Continuous variables were presented as means and standard deviations, categorical variables such as sex were presented as numbers and percentages, and continuous outcome variables were compared using the Student t-test.

Results: Among the referred children (n = 112), 11 boys and 6 girls met the eligibility criteria (mean age 7.8 years). The dropout rate at 6 months in the control group was 80%, compared with 50% in the intervention group. The mean waiting time was significantly shorter in the intervention group (1.3 weeks) than the control group (7.1 weeks); P = 0.026. The mean difference in the Childhood Behavior Checklist total score over time was significantly higher in the intervention group (P = 0.042), but the mean difference in the Vanderbilt scale was not significant.

Conclusion: Tele-collaborative care for children with attention deficit hyperactivity disorder within primary health care is feasible.

Keywords: attention deficit hyperactivity disorder, child psychiatry, mental health, primary care, digital health, Dubai, UAE.

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Introduction

Attention deficit hyperactivity disorder (ADHD) is a pervasive neurodevelopmental disorder characterized by developmentally inappropriate levels of inattention and/or hyperactivity/impulsivity (1,2). ADHD is associated with long-term adverse outcomes and is a public health burden (3–5). Despite the availability of safe and effective treatments for ADHD (6), a large proportion of children with ADHD are unable to access services (7). This is because of limited availability of qualified professionals (8) and a lack of awareness of the condition among the public (9), among other reasons.

Dubai is the commercial hub of the United Arab Emirates with a population of about 3.2 million (10). The prevalence of ADHD among school-aged students in the United Arab Emirates is about 4% (11). Specialized ADHD services are limited in Dubai, despite 2000 paediatric psychiatry assessments a year (12). The United Arab Emirates and the Eastern Mediterranean Region in general have a considerable shortage of mental health resources for young people (13). Thus, new approaches are needed to improve health care access for children with ADHD.

Several methods have been implemented worldwide to improve access to paediatric mental health services in general (14) and for ADHD specifically, including tele-health services (15) and collaborative care models (16,17). This paper presents the results of a randomized controlled trial that examined the effectiveness of collaborative tele-mental health for children with ADHD in primary health care in Dubai: Effectiveness of Collaborative Tele-Mental Health Services for ADHD in Primary Care (ECTSAP) (ClinicalTrials.gov Identifier: NCT03559712) (18). The outcomes of the first phase of the ECTSAP trial are reported, which involved the development, implementation and evaluation of an intensive ADHD training programme tailored to the needs of primary health care physicians for the purpose of implementing a collaborative care model. The outcomes in a sample of children with ADHD randomized to receive care from the trained primary health care physicians (experimental arm) or standard care are examined.

Methods

Training of primary care physicians

A 35-hour ADHD course was designed and delivered. Pre- and post-course assessments were conducted, including multiple-choice questions and structured clinical stations to assess the the knowledge of participants and their clinical interviewing skills. A confidence survey consisting of 6 items, 5 close-ended questions (Likert scale) and 1 open-ended question, was administered at baseline and at the end of the training.

Patients and eligibility

Children aged 6–12 years attending primary health care centres who met the DSM-5 criteria for ADHD (1), as determined by clinical assessment and the threshold on the Vanderbilt ADHD rating scale (19) in two or more settings, were enrolled in the study. Children with cardiac disorders, seizures, autism spectrum disorder, intellectual disability, and active primary psychiatric illness other than ADHD were not eligible for this study. Verbal consent was obtained from patients and signed consent was obtained from their parents. Randomization was done using a computer-generated randomization code at the primary health care centres at the time of the initial consultation to determine eligibility for the study. Individual allocations were sealed in sequentially numbered opaque envelopes which were opened after consent was obtained. The randomization sequence was created using Stata 14.2 software with a 1:1 allocation using random block sizes of 2 and 4. The blocks of 2 were done for 60% of the participants and blocks of 4 for 40% of the participants. This mixing of block sizes was done so that the research team would not have to guess the allocation.

Baseline assessments included: the Vanderbilt Behavioral Assessment Scale (19); the Columbia Impairment Scale (20); the Childhood Behavior Checklist (21); and the Strength and Difficulties Questionnaire (22). Parents also completed a questionnaire on sociodemographic, clinical and medical characteristics of their children. The as-usual treatment primarily consisted of referral to specialized mental health services. The participants in this control group completed the same baseline, 3- and 6-month assessments and scales. Research appointments to complete outcome scales were scheduled at 3 and 6 months after recruitment into the study and included administering the Vanderbilt Behavioral Assessment Scale and the Columbia Impairment Scale to both groups.

Statistical analysis

Continuous variables are presented as means and standard deviations (SD). Categorical variables such as sex are presented as numbers and percentages. Continuous outcome variables were compared using the Student t-test. As the outcome variables such as the Vanderbilt Behavioral Assessment Scale and Columbia Impairment Scale were measured at various times (baseline, 3 months and 6 months) repeated measures analyses for longitudinal data were conducted with an exchangeable correlation structure. Exact P values are presented.

Ethical approval

The project was approved by the Dubai Scientific Research Ethics Committee, under the Dubai Health Authority, and exempted by Harvard University given that the study was conducted in the United Arab Emirates and Harvard University had no clinical involvement. Administrative approval was obtained from Al Jalila Children’s Specialty Hospital management and primary health care centres in the Dubai Health Authority. The study is registered under

ClinicalTrials.gov, identifier: NCT03559712 (18) and was funded by the Dubai-Harvard Center for Global Health Delivery in Dubai.

Results

Stage 1: Training of primary health care physicians

All physicians working in childcare clinics in primary health care centres under the Dubai Health Authority were invited to the study (n = 12). Six of them attended the 35-hour ADHD course, 3 declined due to time constraints and 3 did not respond. Physicians who participated in the training were similar to all the physicians in terms of sex distribution: 50% of physicians enrolled were males and 58% of the total physicians were males. After the training, participants reported improved confidence in the following areas: recognizing symptoms of ADHD [mean (SD): 1.66 (0.51), P = 0.001]; using clinical tools [mean (SD): 1.83 (1.16), P = 0.012]; developing a treatment plan [mean (SD): 2.83 (0.98), P = 0.001]; prescribing and monitoring medications [mean (SD): 2.33 (1.36), P = 0.009]; and answering parents questions about ADHD [mean (SD): 1.83 (1.16), P = 0.012]. In terms of knowledge, the mean percentage pre-course score in the multiple-choice questions was 42%, while the mean percentage post-course score was 78% (P = 0.001). All candidates successfully passed the structured clinical stations.

Stage 2: Randomization phase, and continuous training

In stage 2 of the training programme, primary care physicians attended monthly live ADHD online seminars and had weekly supervision meetings via videoconferencing with a senior child psychiatrist to discuss clinical cases. The 6 primary care physicians who we trained started ADHD collaborative care clinics that were distributed across different areas of Dubai. All primary care physicians under the Dubai Health Authority were informed about these research clinics. Once the referral by the primary health care doctor was made to an ADHD clinic, the child was screened by the research psychologist for eligibility criteria, consent was obtained, and the child was randomly assigned to 1 of the 2 study groups, either assessment and treatment by a trained primary care physician (intervention group), or referral to mental health services (control group).

Sample characteristics and findings

A total of 112 patients were referred to the collaborative care ADHD clinics, and 18% of the referred sample (n = 20) were eligible for inclusion in the study. The most common reason for non-eligibility was age younger than 6 years (44%), not meeting ADHD criteria (29%) and presence of autism comorbidity (12%). Of the 20 children enrolled, 10 were allocated to the intervention group and 10 to the control group. Figure 1 is a flowchart of the recruitment of patients into the study and Table 1 summarizes the baseline clinical characteristics of the sample and the Childhood Behavior Checklist scores.

The dropout rate at 6 months in the control group was 80% compared with 50% in the intervention group.

The mean difference for the outcome in the Childhood Behavior Checklist internalizing scores was 12.3 (95% CI: –1.6 to 26.3) suggesting that the intervention group had higher scores than the control group (P = 0.078). Similarly, the difference in the Childhood Behavior Checklist externalizing score was 11.9 (95% CI: 0.9 to 22.9) which was significantly higher in the intervention group (P = 0.036). The mean difference in the Childhood Behavior Checklist total score was 12.4 (95% CI: 0.5 to 24.4), again significantly higher in the intervention arm (P = 0.042).

The efficacy analyses, that is, the mean difference and 95% confidence intervals (CI) of the outcome variables (Vanderbilt scores and performance scores) between the two groups are presented in Table 2 . The table also presents the findings of the repeated measures regression analyses for Vanderbilt outcomes as measured at baseline, 3 months and 6 months. In the outcome Vanderbilt scale, although the score in the intervention group increased over time – mean difference 2.0 (95% CI: –6.5 to 10.5) – the difference was not statistically significant. Similarly, the outcome performance declined in the control group at 6 months completely, as compared with the intervention group. However, the mean difference over time was not statistically significant: –0.719 (95% CI: –2.2 to 0.81). The mean (SD) of waiting time was 1.3 (4.0) weeks in the experimental group which was significantly shorter than 7.1 (6.3) weeks in the control group (P = 0.026).

Discussion

This paper describes ECTSAP, a clinical trial in Dubai to enhance access to mental health care in primary health care centres for children with ADHD using a collaborative tele-mental health approach. Primary health care physicians were successfully recruited and trained for this study, despite many obstacles, including busy schedules. As a result, physicians trained by ECTSAP were able to assess and follow up children with ADHD through the collaborative care model. However, this result should be interpreted with caution given the limited sample size and slow recruitment. The higher dropout rate in the control group may suggest that parents are either going elsewhere or giving up on having their children assessed and treated because of the very long waiting time; this observation warrants further exploration. Despite the small size of the patient sample, the demographic and clinical characteristics (predominantly male, high oppositional defiant disorder and anxiety comorbidity) are similar to those of larger samples from other countries (23).

Our study has a number of limitations. First, the sample size of 6 trainees was small which raises questions about the generalizability of the findings. However, it is important to note that

this number was 50% of the eligible physicians for our study and therefore represents good engagement and commitment. Furthermore, the patient sample was recruited through primary health care centres and recruiting from the community may have improved the representativeness of the sample. One of the most surprising findings was the slow recruitment rate of patients. This may be a reflection of existing barriers, indicating a need for further investigation as well as public awareness and stigma reduction interventions.

An important finding is that the waiting time for assessment and treatment was significantly shorter in the intervention group. This finding, together with the higher dropout rate in the control group, indicates that such innovative approaches can solve some challenges in the healthcare system, including long waiting time for clinical services. The comparable outcomes in the 2 groups indicate that primary care physicians who are trained on ADHD and work collaboratively with experienced clinicians may be able to effectively diagnose and treat ADHD. However, the small sample size and limitations of our study must be considered in relation to this finding.

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Competing interests: None declared.

Efficacité des soins collaboratifs en télésanté mentale pour les enfants présentant un trouble déficitaire de l'attention avec hyperactivité à Dubaï

Résumé

Contexte : Le trouble déficitaire de l'attention avec hyperactivité est un trouble neurodéveloppemental courant. L'accès aux services de soins nécessaires au traitement de ce

trouble représente un défi mondial qui nécessite des interventions innovantes.

Objectif : Déterminer l'efficacité des soins collaboratifs en télésanté pour la prise en charge du trouble déficitaire de l'attention avec hyperactivité dans les centres de soins de santé primaires à Dubaï.

Méthodes : Six médecins qualifiés ont inauguré des cliniques de soins collaboratifs à Dubaï. Des enfants éligibles âgés de six à 12 ans, présentant un trouble déficitaire de l'attention avec hyperactivité et suivis dans des centres de soins de santé primaires ont été sélectionnés de manière aléatoire pour recevoir des soins collaboratifs en télésanté ou un traitement standard. Les évaluations initiales ont été réalisées à l'aide de la Vanderbilt Behavioral Assessment Scale, de la Columbia Impairment Scale, de la Childhood Behavior Checklist, et du questionnaire SDQ (Strength and Difficulties Questionnaire). Les temps d'attente et les résultats cliniques et fonctionnels ont été mesurés et comparés dans les deux groupes. Les variables continues ont été présentées sous forme de moyennes et d'écarts types, les variables catégorielles telles que le sexe ont été présentées en tant que nombres et pourcentages, et les variables de résultats continues ont été comparées à l'aide du Student t-test.

Résultats : Parmi les enfants référés (n = 112), 11 garçons et six filles répondaient aux critères d'éligibilité (âge moyen 7,8 ans). Le taux d'abandon à six mois dans le groupe témoin était de 80 % contre 50 % dans le groupe d'intervention. Le temps d'attente moyen était nettement plus court pour le groupe d'intervention (1,3 semaine) que pour le groupe témoin (7,1 semaines) ; p = 0,026. Au fil du temps, la différence moyenne au niveau du score total de la Childhood Behavior Checklist était considérablement plus élevée dans le groupe d'intervention (p = 0,042), mais la différence moyenne sur l'échelle de Vanderbilt n'était pas significative.

Conclusion : Les soins collaboratifs en télésanté pour les enfants présentant un trouble déficitaire de l'attention avec hyperactivité dans le cadre des soins de santé primaires sont réalisables.

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الخلاصة

: اضطراب نقص الانتباه مع فرط النشاط اضطرابٌ عصبي نمائي شائع . والحصول علىالخلفية
خدمات علاج هذا الاضطراب تحدٍّ عالمي يتطلب تدخلات مبتكرة .

: استهدفنا استقصاء فعالية الرعاية التعاونية عن بُعد لاضطراب نقص الانتباه معالأهداف
فرط النشاط في مراكز الرعاية الصحية الأولية في دبي .

: بدأ ستة أطباء مُدرَّبون عيادات رعاية تعاونية في أنحاء مختلفة في دبي ,طرق البحث
وبطريقة عشوائية، اُختِير أطفال مؤهلون تتراوح أعمارهم بين 6 و12 عامًا ممن يرتادون
مراكز رعاية صحية أولية ويعانون اضطراب نقص الانتباه مع فرط النشاط لتلقي إما رعاية
صحية تعاونية عن بُعد أو العلاج القياسي . وأُجريت التقييمات الأساسية باستخدام مقياس
فاندربيلت للتقييم السلوكي، ومقياس كولومبيا للإعاقة، والقائمة المرجعية لسلوك
الأطفال، واستبيان القوة والصعوبات . وقيست أوقات الانتظار والحصائل السريرية
والوظيفية في كلتا المجموعتين، وجرت المقارنة بينهما . وقُدِّمت المتغيرات المستمرة
بوصفها متوسطات وانحرافات معيارية، وقُدِّمت المتغيرات الفئوية مثل الجنس في شكل
أرقام ونسب مئوية، وقُورنت متغيرات النتائج المستمرة باستخدام اختبار Student t-test.

: من بين الأطفال المشار إليهم (إجمالي العينة = 112) ، استوفى 11 صبيًا و 6 فتياتالنتائج
معايير الأهلية (متوسط العمر : 7.8 سنوات). وعند مرور 6 أشهر، بلغ معدل التسرب في
المجموعة الضابطة 80% مقارنة بنسبة 50% في مجموعة التدخل . وكان متوسط وقت الانتظار في
مجموعة التدخلات (1.3 أسابيع) أقصر بكثير من المجموعة الضابطة (7.1 أسابيع) ؛ القيمة
الاحتمالية = 0.026. وكان متوسط الفرق في إجمالي درجة القائمة المرجعية لسلوك الأطفال
بمرور الوقت أعلى بكثير في مجموعة التدخل (القيمة الاحتمالية = 0.042) ، ولكن متوسط
الفرق في مقياس فاندربيلت لم يكن كبيرًا .

: تبين جدوى وفاعلية الرعاية التعاونية عن بُعد للأطفال المصابين باضطراباالاستنتاجات
نقص الانتباه مع فرط النشاط في إطار الرعاية الصحية الأولية .

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