

Adaptation and Feasibility of KONTAKT™ Social Skills Toolbox Group Program for Australian Autistic Children

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Abstract

Background: Although autistic individuals are interested in interacting with peers, they express a need for social skills programs that could support them in navigating their daily social world, which is governed by neurotypical social norms.

Aim: This study investigated the feasibility and adaptability of the manualised and evidence-based program KONTAKT™ Social Skills Toolbox Group Program in supporting autistic children aged 8 to 12 years in navigating their everyday social worlds.

Material and Methods: KONTAKT™ was delivered to 15 autistic children (Mage=10.87, SDage=1.04; 67% male) over 16, 60-minute sessions. A pre-test and post-test design was employed evaluating changes in personally meaningful social goals, social skills, quality of friendship and autistic traits. Focus groups were also conducted and analysed using thematic analysis post completion of the program, exploring participants, their parents and the KONTAKT™ trainer's perceptions of the program.

Results: Findings suggest stakeholders' satisfaction with the program's content and structure, indicating the potential cross-age feasibility of KONTAKT™ in supporting autistic children to achieve their personally meaningful social goals and in improving their social performance navigating their daily social lives.

Conclusion and significance: This feasibility study supported the finalisation of KONTAKT™ children's manual and workbooks, preparing it for further evaluation of its efficacy in a randomised controlled trial. (Australian New Zealand Clinical Registry: 12619000994189; ClinicalTrials.gov: NCT04024111).

Keywords: Autistic children, Feasibility, Intervention, KONTAKT™ Social Skills Toolbox Group Program, Social skills

Introduction

Children spend a large portion of their time participating in social activities in various contexts, either in-person or online (1). A child's ability to engage meaningfully in their everyday social world influences their quality of life, relationships, mental health and adulthood outcomes such as employment, independent living and further education (2,3). Existing diagnostic guidelines define autism as difficulties with social communication and interaction (4), causing challenges in everyday living domains. Notably, more recent literature suggests that a key influencing factor of the difficulties autistic children experience lies in the lack of reciprocal social understanding between autistic individuals and their

non-autistic peers (5). In 2021, autistic youth aged 5 to 14 years represented approximately 4.05% of the Australian population in this age bracket (6), a number comparable to the reported prevalence in Europe for primary school-aged children (7).

Autistic young people are required to function in a world dominated by neurotypical views of socialising and social interaction (5). While many autistic youths successfully develop relationships and communicate with their autistic peers, they find interactions within a neurotypical context challenging (8,9). Autistic children often encounter significant social challenges when navigating relationships in a predominantly neurotypical world, due to differences in social cognition, communication styles, and the

expectations surrounding friendships (10). While autistic advocates are increasingly promoting the need for neurotypical individuals to accommodate the communication and interaction styles of autistic individuals (5), many autistic individuals still seek programs that support them in developing their social skills, enabling their functioning in a predominately neurotypical world (11). A focus on functional outcomes promotes both the development of an individual's skills and highlights the need for environmental accommodations (12). It has been proposed that a functional approach can work towards reconciling historical medically driven approaches to autism focuses on remediating challenges within the individuals, and the neurodiversity paradigm, which highlights the importance of neuro-affirmative action, whereby the neurotypical world works towards accommodating autistic individuals (12). Social skills group programs (SSGPs) are psychosocial programs more commonly developed to support autistic school-aged youth with IQ>70 to understand and interpret non-autistic behaviour and mental states and function in a non-autistic social world (11). SSGPs are commonly delivered by one to three trainers to a small group of autistic youth (two to six participants) across 12 to 16 weekly 60-to-90-minute sessions (11).

KONTAKT™ is an evidence-based SSGP available for both autistic children and adolescents, with the duration of the sessions being shorter for the children group (60 minutes) compared to adolescents (90 minutes) (13). This manualised program is available in German, Swedish, Norwegian, Turkish, Chinese, and English and can be delivered in three variants, 12, 16 and 24 weeks (13). Two randomised pragmatic controlled trials (RCTs) in naturalistic settings investigated the efficacy of the 12-session (n=296) and 24-session variants (n=50) of KONTAKT™ for Swedish youth aged 8 to 18 years compared to treatment as usual control groups (14,15) using the Social Responsiveness Scale 2nd Edition as the primary outcomes (SRS-2) (16). Findings indicated that immediately after completing the 12-session variant, KONTAKT™ had a small significant effect in decreasing challenges in social awareness, cognition, motivation, and communication in adolescent participants only, especially females (14). Findings from the 24-session variant, however, demonstrated large effects across ages after participants completed the additional sessions, highlighting the importance of dosage in understanding the efficacy of SSGP (15). Given this study's small sample size, moderator analysis based on age group was not possible. This lack of information, coupled with the absence of significant effects for autistic children aged 8-12 in

the 12-session variant, makes the program's efficacy for this age group unclear.

Cultural aspects underpin how social skills are performed (17). Given the cultural similarities between Sweden and Australia, a feasibility study was conducted to assess the cross-cultural feasibility of KONTAKT™ in Australia for adolescents (18). Upon making the necessary cultural adjustments, the efficacy of its 16-session variant was evaluated for autistic adolescents aged 12 to 17 years via an RCT compared to an active control social cooking group, controlling for the possible effects of exposure to a social context (e.g., group cohesiveness) (19). Findings demonstrated that although adolescents from both groups reported progressing towards their personally meaningful social goals at post-test, only those in the KONTAKT™ group reported small sustained or further effects towards their goals at 12-week follow-up (19). Adolescents and their parents also reported high satisfaction with the structure and content of KONTAKT™, perceiving it had improved adolescents' social understanding, communication, relationships, and feelings of empowerment (20).

Although these findings demonstrated the efficacy of the KONTAKT™ for Australian adolescents, given the uncertainty of the Swedish studies regarding the efficacy of the program for children, it is unclear whether similar findings can be replicated for a younger age group. Other than the different session durations, the Swedish KONTAKT™ utilises the same content and structure for both children and adolescents. While young people experience significant social and emotional development from childhood to adolescence there are also many changes in societal expectations and social contexts across these developmental stages (21,22). Given the differences in the maturity of the emotional and temperamental development of autistic children and adolescents (21,22), it seems necessary to tailor KONTAKT™ content and workbooks for a younger audience. Similar to existing SSGPs, KONTAKT™ content has been developed by health professionals, and it is unclear how much the autistic children's views and opinions has driven the content of the participant workbook (23). Additionally, evaluation of existing SSGPs for children has mainly relied on parent proxy reports of their child's autistic traits, neglecting how attending the program has supported the children's social knowledge or performance. To address these limitations, the present study aimed to understand the acceptability and feasibility of a tailored children's variant of the 16-session KONTAKT™, based on feedback from autistic children, their parents, and facilitators delivering the program.

Material and methods

The current study explored the acceptability and feasibility of delivering the 16-session variant of KONTAKT™ SSGP to autistic children within an Australian service delivery context. This process involved a three-step approach. During Step 1, the content of the KONTAKT™ SSGP, previously evaluated with Australian autistic adolescents (19), was adapted to meet the more specifically the needs of autistic children aged 8 to 12 years. These changes included reducing the amount of text and adding coloured visuals to enhance the attention of children. Step 2 involved using a one-group pre-test post-test design with focus groups after completing the program to explore whether this program was acceptable and feasible for Australian autistic children. Step 2 assessed the acceptability of the program for children aged 8 to 12 years and was guided by Bowen and colleagues (2009) framework for designing feasibility studies (24). The unforeseen onset of the global COVID-19 pandemic and the restrictions and shutdowns in Australia associated with community transmission required adding a further step within Step 2 to modify the content and activities of KONTAKT™ SSGP for online delivery. Step 3 involved amending and finalising KONTAKT™ SSGP for Australian autistic children to be evaluated for efficacy via an RCT.

Step 1: Age Adaptation

At the commencement of Step 1, a neurodiverse working group (neurotypical and neurodivergent), consisting of researchers, clinicians and parents to autistic adolescents was formed. The group members had backgrounds in psychology, occupational therapy and special education and had extensive experience in developing and delivering group programs to autistic individuals. The working group provided feedback on the age appropriateness of the manual and workbooks evaluated with Australian autistic adolescents for Australian autistic children, suggesting modifications to the content. Consequently, several games, activities, and scripts used in the role-play scenarios were modified to reflect activities frequently engaged in by Australian children.

Step 2a: Feasibility Study

Design

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KONTAKT™ Social Skills Toolbox

KONTAKT™ SSGP is a social skills program originating from Germany (27) developed for autistic youth aged 8 to 18 years (13). The program has

TABLE 1. Areas of interest for assessing the feasibility of KONTAKT™ for Australian Autistic children (Bowen et al., 2010)

Area of focus	Methodology
Acceptability	<ul style="list-style-type: none"> - Autistic children, caregivers, and KONTAKT™ trainers' qualitative feedback from the focus groups - Motivation to participate captured via weekly texts - Attendance rate
Demand	<ul style="list-style-type: none"> - Autistic children, caregivers, and KONTAKT™ trainers' qualitative feedback from the focus groups - Expression of interest received from families
Implementation	<ul style="list-style-type: none"> - Training and supervision for the KONTAKT™ trainers by the Swedish developers while receiving monthly supervision - Program fidelity checklist
Practicality	<ul style="list-style-type: none"> - Participants' attendance rate - Autistic children, caregivers, and KONTAKT™ trainers' qualitative feedback from the focus groups
Adaptation	<ul style="list-style-type: none"> - Previous evaluations of KONTAKT™ in Australia and Sweden - Applying necessary modifications suggested by autistic children, caregivers, and KONTAKT™ trainers' qualitative feedback from the focus groups
Integration	<ul style="list-style-type: none"> - Certifying the KONTAKT™ trainers after delivering a 16-session KONTAKT™ program with supervision
Expansion	<ul style="list-style-type: none"> - KONTAKT™ trainers' qualitative feedback from the focus groups
Efficacy testing	<ul style="list-style-type: none"> - Primary/secondary outcomes assessing the preliminary efficacy of the program

utilised varied principles from cognitive behaviour therapy, behaviour activation, observational learning, psychoeducation, and social cognition therapy to support autistic youth in navigating their everyday social life (13). KONTAKT™ SSGP sessions consist of structured and semi-structured components employing implicit and explicit strategies to support autistic youth in navigating their social worlds. Each session follows a set agenda repeated across the 16 weeks (Table 2).

The content of all three variants of KONTAKT™ are scaffolded, with each targeting more basic social skills during the initial sessions progressing to more complex skills as the program continues. While the 12-session (short) variant focuses on delivering the skills-based components of the program, the intermediate (16-session) and long (24-sessions) variants encourage participants themselves to lead and facilitate some of the sessions (4 and 10 sessions in the intermediate and long variants, respectively). Within the intermediate and long variants, one session is dedicated to an excursion to a community setting (e.g., going to a cafe), to provide an opportunity for participants to practise their social skills in an unstructured everyday setting (13).

KONTAKT™ groups are designed to be led by two to three health professionals experienced in facilitating groups with autistic children or adolescents. The training involved a two-and-a-half-day workshop, educating the trainers on the principles and theories underpinning the program and how to deliver the content. In addition, at least one of the trainers must be certified in the program delivery and supervised while running one of the program variants (short, intermediate, or long). The group trainers provide positive feedback and reinforcement, encouraging the participants to work towards their personally meaningful goals and actively engage with the various KONTAKT™ activities. At least one caregiver is encouraged to attend the KONTAKT™ parent sessions held at the beginning (all three variants), middle (one for the intermediate and two for the long variant), and the end of the program (all three variants). Parent sessions serve to inform caregivers of the group's progress, outlining the social skills targeted in the sessions, encouraging parents to support their children in completing weekly homework assignments, and positively reinforcing their social participation.

TABLE 2. An example of a KONTAKT™ session

<i>Agenda</i>	<i>Description</i>
Opening round	Encourage participants to connect by asking them to share a recap of their week and express how they felt at the start of the session. Each participant then passes the turn to the group member sitting beside them.
Homework revision	Trainers review each group member's homework assignments (missions) from the previous session, encouraging them to share their experiences with the group.
Group discussions	Rather than adopting a didactic approach to teaching, trainers encourage participants (1) discuss different social skill topics; (2) share their previous experiences with that skill; (3) brainstorm various options for performing the skill, considering the short and long-term consequences; (4) considering what actions might apply to group members everyday lives. Depending on the available time and abilities of group members, an advanced option is also provided. For example, for the topic of "What is ASD?" the advanced topic is "Disclosing my ASD diagnosis to others."
Snack Time	Allow group members to use and practise their learnt skills (e.g., turn-taking, initiating conversation, small talk) in an unstructured situation. During this time, when necessary, the trainers can provide prompts to facilitate socialising.
Group activities	Encourage and reinforce group cohesion, cooperation, participation, social interaction and communication skills (verbal and non-verbal) through various games and activities such as role-play, charades, and group activities (e.g. baking together).
Assigning new homework	Assign new homework assignments (missions) based on the next session's social skills topic, preparing the participants and encouraging them to generalise the skills already covered to their everyday worlds. For example, "Setting goals" or "Analysing difficult situations".
Closing round	Recap the session, with each member sharing their experiences and suggestions for improving the group. Members then share their feelings and plans for the coming week.

The present study aimed to understand the acceptability and feasibility of the intermediate length variant of KONTAKT™ (16 sessions) to two groups of autistic children across two Australian school terms (each approximately 10 weeks in duration) in 2020, delivering eight sessions from February to April (Term 1) and another eight from May to July (Term 2). KONTAKT™ was delivered by two trainers according to procedures outlined in the manual for children aged 8-12 years, with sessions lasting approximately 60 minutes (13), resulting in each child receiving 16 hours of direct contact. It was estimated that each of the two KONTAKT™ trainers committed 21.5 hours in delivering all sixteen 60-minute sessions (including 5.5 hours for preparing materials and following up on the participants). The trainers delivering KONTAKT™ sessions for this study were trained and supervised by certified KONTAKT™ trainers. Their adherence to the KONTAKT™ manual and trainer workbooks was systematically assessed every session via a checklist developed specifically for assessing the fidelity of the delivery of the KONTAKT™ program in Australia (27).

Setting

The KONTAKT™ sessions were delivered in partnership with the Autism Association of Western Australia (AAWA) at two AAWA metropolitan centres in Perth, Western Australia. AAWA is a specialist organisation delivering services to autistic people and their families and has more than 80 staff trained and certified in delivering KONTAKT™. Trainers delivering the KONTAKT™ program evaluated in the present feasibility study were AAWA staff, experienced in delivering groups to autistic children, all of whom had been trained and supervised in delivering the KONTAKT™ program.

Participants

The sample was recruited through AAWA and existing contact lists of Curtin University's Autism Research Group in late 2019. To be eligible for inclusion in the present study children were required to meet the following: (a) aged 8-12 years; (b) Clinically diagnosed with autism in Australia (4,28) confirmed via administering the Autism Diagnostic Observation Schedule-2nd edition (ADOS-2) (29); (c) having an IQ>70 as assessed by the Wechsler Abbreviated Intelligence Scale 2nd edition (WASI-II) (30); (d) intrinsically motivated to participate in a social skills program. Children were excluded from the study if: (a) they had insufficient English language skills or expressed low motivation to participate; or if (b) caregivers reported their children as demonstrating externalising behaviours in the clinical range, as assessed via the Child Behaviour Checklist (CBCL) (31), or any history of severe clinically assessed self-injury, conduct disorder, oppositional defiant disorder, pathological demand avoidance or any form of psychosis.

Prior to enrolling in the study and attending a screening visit, all prospective participants and their parents were provided with an information sheet clearly outlining the study and their potential involvement. Particular attention was paid to ensuring the children's information sheet was easy to read and age-appropriate. The study procedures and participant requirements were further explained at the screening visit, with discussions with children supported by visual aids. After collecting parents' informed consent and children's ascent to participate in the study, a screening visit was administered, assessing the participant's eligibility. Ethical approval for this study was obtained from Curtin University Human Research Ethics Committee (Perth, Australia) prior to commencing the study (HRE2017-0245). The first author, who was trained

TABLE 3. Children's sociodemographic and clinical characteristics

		<i>M</i>	<i>SD</i>	<i>Range</i>
Age (years)		10.87	1.04	[9, 12]
WASI-II	VCI	108.73	17.37	[85, 149]
	PRI	102.8	14.66	[77, 130]
	FSIQ	106.67	13.23	[79, 132]
CBCL	Internalising	18.07	8.65	[4, 37]
		<i>n</i>		<i>%</i>
Gender	Female	5		33
	Male	10		67
Diagnosis	Autism ¹	2		13
	ASC ²	13		87
Co-occurring	ADHD	5		33

Note: ADHD = Attention deficit hyperactivity disorder; ASD = Autism spectrum condition; CBCL = Child Behaviour Checklist; FSIQ = Full-Scale Intelligence Quotient; PRI = Perceptual Reasoning Index; VCI = Verbal Comprehension Index; WASI-II = Wechsler Abbreviated Scale of Intelligence – 2nd edition. 1 Diagnostic and Statistical Manual for Mental Health Disorders – Fourth Edition. 2 Diagnostic and Statistical Manual for Mental Health Disorders – Fifth Edition

TABLE 4. Parent sociodemographic characteristics

		<i>M</i>	<i>SD</i>	<i>Range</i>
Age (years)		41.0	7.2	[29, 55]
		<i>n</i>		%
Gender	Female	14		93
	Male	1		7
Marital Status	Divorced	2		13
	Married (married de facto)	11		73
	Separated	2		13
Income*	<\$1000	6		40
	\$1,000-\$1,999	2		13
	\$2,000-\$2,999	5		33
	>\$3,000	2		13
Ethnicity	North and Western European	5		33
	Oceanian	4		27
	South and Eastern European	2		13
	South-East Asian	1		7
	Sub-Saharan African	3		20
Education	Bachelor's degree	8		53
	High school	4		27
	Master's degree or higher	1		7
	TAFE/Alternative Diploma/Certification	2		13

Note: TAFE = Technical and Advanced Further Education. * Weekly family income before tax

and research-reliable with the ADOS-2 and WASI-II, conducted the screening visit at a Curtin University psychology lab. Of the 19 families expressing their interest in participating in the study, four families were excluded as one child was not motivated to participate ($n=1$), two were screened as having an $IQ < 70$, and parents expressing a wish not to disclose the autism diagnosis to their child ($n=1$). The 15 included children (67% male) were aged on average 10.87 years ($SD=1.04$). They all had confirmed clinical diagnoses of autism, with two being diagnosed according to DSM-IV (24) and the remaining using DSM-5 criteria (5). Tables 3 and 4 outline child and parent sociodemographic and clinical characteristics.

Data collection

All sociodemographic (age, gender, socioeconomic status, ethnicity, educational background, and family's weekly income before tax) and clinical characteristics (diagnosis, IQ, depressive and anxious behaviours) were obtained at the initial screening visit. If eligible, the child was enrolled in the study and was invited to attend three further assessment sessions with their caregiver: (1) one to two weeks before commencing the KONTAKT™ groups (Baseline); (2) immediately following the completion of the 16th session (post-test). Focus groups were conducted with KONTAKT™, children, and parents immediately following the completion of the program (16 weeks from baseline). All data collection interviews and focus groups were conducted by the

first author, who was not directly involved in delivering the KONTAKT™ sessions.

Primary outcome measure - Child

Goal Attainment Scaling (GAS) captured children's progress toward their personally meaningful social goals (32,33). During the baseline data collection visit, in collaboration with their parents and the first author (experienced in working with autistic youth), each child set three personally meaningful social goals (33) using a diamond ranking approach (34). GAS is scored on a 5-point Likert scale, ranging from -2 (*much less than expected*) to +2 (*much better than expected*). Two independent raters (BA, MB) scored the scales for each goal for measurability (Intraclass correlation coefficient [ICC] = .81 [.64, .90], $p < .001$), equidistance (ICC = .81 [.64, .90], $p < .001$), and level of difficulty (ICC = .81 [.64, .90], $p < .001$), ensuring their reliability and comparability (35). Participants' goals were mainly related to resolving conflicts/disagreements, finding friends, engaging in activities, and starting or ending conversations. At the post-test, the first author collected children's and their parents' perceptions of how the child was performing in relation to their goal, allowing an informer reliability check of the results. Upon summing up the scores from all three goals for each child the total scores were converted to T-scores ranging from 22.62 to 77.38, with higher T-scores indicating greater progress ($p=.275$) (33).

TABLE 5. Selected items from Social Interaction Anxiety Scale for autistic children

Item	Factor	Loading
I worry that I won't know what to say in social situations.	1	0.82
I am tense mixing in a group.	1	0.82
I find it difficult to disagree with another's point of view.	2	0.57
I feel uncomfortable working with a group (e.g., group assignment or game).	3	0.56
I become tense if I have to talk about myself or my feelings.	4	0.49
I feel tense if I am alone with just one other person.	5	0.43

Note: The items were chosen based on a factor analysis conducted based on data at baseline from the randomised controlled trial of KONTAKT™ for adolescents (Afsharnejad et al., 2021a).

Primary outcome measure - Parent

The Social Skills Group Assessment Questionnaire (SSGAQ) is a parent proxy report assessing autistic children's social competence in navigating their everyday social worlds (36). This 23-item parent proxy-reported measure is rated on a 3-point Likert scale, ranging from 1 (*worse than peers*) to 3 (*better than peers*). SSGAQ's total scores range between 23 to 69, with higher scores indicating that parents perceive their child had better social performance than their peers. The measure has shown high internal consistency in previous KONTAKT™ studies capturing parents' perception of their child's social communication skills (Cronbach's $\alpha=.97$) (37).

Secondary outcome measures

Children's ongoing motivation for participating and engaging in KONTAKT™ was solicited via weekly texts sent to families after each session. The texts contained two child-report and two caregiver proxy-report questions, asking, "How much did you (your child) like attending this week's session?", and "How interested are you (your child) in attending the next session?" Participants scored these questions via a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). Emojis were used with the text as a visual guide for children (Online Resource 1). Data from this measure was matched with children's attendance to check for reliability.

The Social Interaction Anxiety Scale (SIAS) was used to measure children's self-reported anxiety about their experiences within a group setting via weekly texts sent to families after each KONTAKT™ session (38). SIAS is a 20-item measure. With approval from the original developers of the SIAS, a factor analysis was conducted with the data from our previous KONTAKT™ study with autistic adolescents (19), identifying five factors for the measure. In order not to burden the autistic children with a lengthy weekly survey, a shorter version of SIAS was used. Item with the highest loading from each factor was selected; however, there were two items with similar loadings from one of the five factors, therefore both were included in this study resulting in a 6-item SIAS (Table 5) (39). These items were scored on a 5-point Likert scale, ranging from 0 (not at all) to 4

(extremely). Total scores ranged from 0 to 24, with lower scores indicating the participants had experienced less anxiety when socialising with their KONTAKT™ groupmates. The full-item SIAS has been validated for an Australian context (40) and indicated good reliability (Cronbach $\alpha=[.88, .94]$) (38).

The LERID Friendship Scale, a longer version of the Friendship Quality Scale, assessed how autistic children perceive the quality of their existing friendships (41). This self-reported measure is comprised of 46 items rated on a 5-point Likert scale ranging from 1 (Not true) to 5 (Really true). In completing the measure, the child first nominates their 'best friend' and then rates the quality of their friendship based on the following 11 aspects: trust of the friend, comfort, protection from victimisation, security, help, commitment, satisfaction, help, affection and trust received from the friend. Total scores ranged between 46 and 230, with higher scores indicating better friendship quality. The FSQ has shown good psychometrics with Cronbach α between 0.71 and 0.86 (42).

The Social Responsiveness Scale - Second edition (SRS-2) captured the autistic-like traits of participants via parent proxy reports at the pre-test and post-test (16). The 63-item measure is scored on a 4-point Likert scale, ranging from 0 (not true) to 3 (almost always true) (16). The measure consists of five subscales, capturing social awareness, social cognition, social communication, social motivation, and restricted interests and repetitive behaviours. Total scores range from 0 to 195, with higher scores indicating more autistic characteristics requiring greater support. The SRS-2 has demonstrated good test-retest reliability of 0.9 for autistic individuals (43). This measure enabled comparability between the current study and previous studies exploring the efficacy of KONTAKT™ and other SSGPs (11).

Focus groups were held with autistic children, their parents and the KONTAKT™ trainers immediately after completing the program (Online Resource 2). During this session, qualitative feedback regarding satisfaction with the program and suggestions for

improving the content was obtained. Data from the focus groups facilitated the modifications applied in Step 3.

Data analysis

The Statistical Package for Social Sciences- Version 24.0 (SPSS-24) for Windows (44) supported data management and analysis. Data were analysed using the Wilcoxon Signed Rank Test with primary and secondary outcome measures as dependent variables for repeated measures. The onset of COVID-19 in March 2020, after only delivering the first seven sessions of KONTAKT™, mandated the remaining sessions to be delivered online. To assess the effect of delivery format on the weekly texts (motivation to participate, enjoyment and social interaction anxiety), a new variable was defined, categorising the sessions into either 'in-person' or 'online'. Due to low attendance, related to self-isolations before the mandated COVID-19 lockdowns, no weekly text was collected in week 7. A Wilcoxon signed-rank test was used to test the differences between these two delivery formats.

The recordings from the focus group sessions were machine-transcribed via the Otter.ai online application and then proofed by the first author. Data from the focus groups was analysed using a reflective thematic analysis to gain a deep understanding of children, their parents and the facilitators' perceived acceptability of KONTAKT™'s structure and content for autistic children. Thematic analysis followed the six steps suggested by Braun and Clark (2021) (45). After reading the interviews and familiarising themselves with the data, the first author analysed the data using Nvivo 12 (46) to establish emerging codes based on their initial reactions and assumptions to establish reflexivity. Once the data was coded, the researcher organised items to generate initial themes, utilising their own knowledge and positionality, leading to the finalisation of the themes.

Step 2b: Interruption in Delivery

The onset of COVID-19 in Western Australia and a state-wide mandated lockdown coincided with the seventh session of KONTAKT™. The lockdowns and restrictions on community movement and gatherings from March 2020 necessitated the final nine sessions of KONTAKT™, data collection interviews/focus groups to be conducted online. At this time, previous variants of KONTAKT™ had been designed and evaluated for in-person delivery. In consultation with the original developers of KONTAKT™, the first author prepared a revised KONTAKT™ trainer's workbook, outlining how to lead KONTAKT™ sessions online (e.g., assigning participants with a number as if they were sitting in a

circle, asking participants to email their homework assignments to trainers). In accommodating for online delivery, several activities were removed (e.g., blinking game), and strategies for delivering the program online were detailed. Caregivers were asked to provide a treat for Snack Time. These changes were approved for this study by the original developers. The fidelity checklist was also updated to accommodate these changes. Families were informed that to attend the online sessions, they required access to a computer monitor (not a mobile phone), an internet connection, a distraction-free space and headphones to protect confidentiality. The online KONTAKT™ sessions were delivered via Zoom (47) in a therapy room at AAWA. The first author collected the post-test data remotely.

Step 3: Applying Required Changes to KONTAKT™

In step 3, the parent, child and trainer workbooks and the KONTAKT™ delivery were modified according to feedback from autistic children, their caregivers, and group trainers. This adaptation supported the application of necessary improvements required to enhance the acceptability of the program for this age group in preparation for future evaluation in a Randomised Controlled Trial (Australian New Zealand Clinical Registry [ANZCTR]: ACTRN12619000994189, ClinicalTrials.gov: NCT04024111)

Results

Step 1: Age Adaptation

Given the efficacy of the 16-session KONTAKT™ program for Australian autistic adolescents and their views of the content (20), it was expected that the program would be broadly acceptable to autistic children with minor adjustments. These adjustments included developing more visual aids, breaking down the homework activities or homework assignments into smaller tasks, and changing the role-play scenarios to make them applicable to a younger group. .

Step 2: Feasibility study

Due to the COVID-19 interruption, six (all males) out of 15 children initially enrolled in the study withdrew from the program and the study. Of the six participants who withdrew, two participants (11 years old) were unable to continue as they did not have access to the technological devices required, and four participants refused to continue the program in an online format. These four children all had a co-occurring ADHD diagnosis and were, on average, slightly younger ($M=9.75$ years; $SD=0.83$) than the nine children who agreed to continue with the program ($M=10.33$ years; $SD=1.05$). On average, the

nine remaining participants attended 89% [75%-100%]) of the KONTAKT™ sessions. On average, children completed 74% [13%-100%]) of their homework assignments. About half of the time (46%), they could complete these assignments independently and rarely (3%) refused to engage with them.

Findings from the fidelity checklists indicated an

acceptable level of adherence by trainers to the program agenda (Median=84% [67%-100%]). Time was cited as the most common reason trainers were unable to adhere to the KONTAKT™ agenda, with this becoming most problematic when the sessions were delivered in an online format. Transitioning to online delivery also required several small modifications to the sessions.

TABLE 6. Changes in Primary and Secondary Outcome Measures from Baseline to Post Completion of KONTAKT™

Outcome		Time	N	Median	p-value	Effect Size
GAS	Child	T1	8	-6.00	.012*	0.89
		T2	8	-2.00		
	Parent	T1	8	-6.00	.018*	0.84
		T2	8	-1.00		
SSGAQ ^a		T1	10	59.00	.005*	0.89
		T2	10	74.00		
LERID ^a		T1	8	172.00	.043*	0.69
		T2	8	202.50		
SRS ^b	Awr	T1	10	13.00	.112	
		T2	10	11.00		
	Cog	T1	10	16.00	.677	
		T2	10	15.00		
	Com	T1	10	32.50	.633	
		T2	10	31.00		
	Mot	T1	10	13.00	.594	
		T2	10	11.00		
	RRB	T1	10	18.00	.109	
		T2	10	15.50		
	SCI	T1	10	77.50	.475	
		T2	10	68.50		
Total	T1	10	94.00	.333		
	T2	10	83.50			
**Motivation ^a	Child	T1	10	5.27	.407	
		T2	9	5.25		
	Parent	T1	10	5.25	.953	
		T2	9	5.11		
**Enjoyment ^a	Child	T1	10	5.27	.401	
		T2	9	5.00		
	Parent	T1	10	5.00	.263	
		T2	9	4.78		
**SIAS ^b		T1	10	15.10	.575	
		T2	8	16.33		

Note: Awr = awareness; Co = Cooperativeness; Cog = cognition; Com = communication; Diff = difference; GAS = Goal Attainment Scaling; Mot = motivation; RRB = Restricted Repetitive Behaviour; SCI = Social Communication and Interaction; SSGAQ = Social Skills Group Assessment Questionnaire; SRS = Social Responsiveness Scale; SIAS = Social Interaction Anxiety Scale. ^a Higher scores indicate better outcomes; ^b Lower scores indicate better outcomes.; *p <.05 **T1 is from week 1 to week 6, while T2 is from week 8 to week 16. Average scores were used for comparisons.

Quantitative findings

As demonstrated in Table 6, both parents and children indicated significant changes in primary outcomes from baseline to post-completion of KONTAKT™. Out of the nine participants, one refused to set goals. They also refused to complete LERID, expressing that they did not have any friends. The Intraclass Correlation demonstrated a good to excellent average measure agreement between raters for GAS, motivation, and engagement ranging from 0.83 to 0.98. Additionally, both Children (ES=.89; $p=.012$) and their parents/caregivers (ES=.84; $p=.018$) indicated the children had made significant progress towards their personally meaningful social goals following KONTAKT™. Overall, parents reported that their children's social skills (SSGAQ), improved after completing KONTAKT™ (ES=.89; $p=.005$). Further, the autistic children reported an improvement in the quality of existing friendships after completing the program (ES = .69, $p = .043$). No further significant changes were observed for the SRS measure. Due to the large dropout after session 8, the effect of attendance was not pursued. Both parents and the children opted to respond to the weekly texts, with an average response rate of 75% [25%,100%]. A Wilcoxon Signed Rank test revealed no significant difference in motivation to participate in KONTAKT™, enjoyment of the sessions and social interaction anxiety (SIAS) between in-person format (Weeks 1 – 6) and Online format (Weeks 8 – 16) as shown in Table 6.

Focus groups

Eight of the nine children attended two online focus group sessions with their mothers. Trainer focus groups were held with the trainers delivering the two KONTAKT™ groups (group 1: $n=2$; group 2: $n=3$). Overall, both parents and children expressed satisfaction with their involvement in KONTAKT™ regardless of the delivery format, describing it as a '100% positive experience'. One parent noted:

My daughter's girls' choir [favourite program] was moved to an earlier time, to the same time as KONTAKT™ ... and she definitely preferred KONTAKT™ over girls' choir

Children described 'really enjoying the group', expressing that they 'had a lot of fun, especially when everyone got to be there', describing their group as 'a family that doesn't fight.' As described below, the thematic analysis of data from the focus groups resulted in four key themes: experience with the structure and content, online delivery format, personal factors, and group context.

Theme 1 - Experiences with the structure and content of KONTAKT™.

Experiences with the structure and content of KONTAKT™ encompassed all participants' opinions relating to the KONTAKT™ sessions. The majority of children and parents described 'liking' the opening round, as they 'found out how everyone was feeling' and 'talked about stuff that had happened' in their lives. They found their fellow group members were empathetic towards them and were 'understanding, kind and considerate.' Children enjoyed 'helping' other group members when they were not feeling well. Despite some children describing the discussion round as 'really boring', they also enjoyed 'seeing how everyone feels about a certain thing or what they think about it.' Some children felt the level of skills targeted in the sessions was at times 'too easy', suggesting KONTAKT™ should target a broader range of skills aligned with the needs of individual participants: 'When the trainers get to know the people [participants] a bit better and like [sic] know what they struggle with'. Several parents echoed this thought, suggesting an initial screening visit before commencing the group to identify the social skills the children 'find the most challenging'.

Snack time emerged as the favourite activity in the KONTAKT™ agenda, with children enjoying being able to 'just talk about anything and eat'. Children expressed their wish for snack time to be longer, complaining that the 'trainers always cut' it short.

Almost all the families struggled with completing the homework assignments. The trainers also described finding it 'really hard to get them to do the missions [homework assignments]'. Many of the children reported finding the homework assignments 'boring' or 'very hard', saying they 'did not understand them'. Some even saw no point in doing them, finding the tasks 'easy and not helpful'. Parents mainly believed their child was either 'not motivated' or did not want to do anything related to the KONTAKT™ 'outside the group [sessions]'. A few parents expressed the activities looked 'open-ended' and that their child 'needed to be guided' through them. One parent suggested a more directive approach for these assignments, sharing that the child 'had trouble thinking of what he could do, or how he could fulfil his missions [homework assignments] even though I gave him support'. To improve motivation for completing the homework assignments, parents suggested 'coming up with it [homework assignments] as a group together' or 'something that they can all work on together'.

Theme 2 - Experience with online delivery.

The need to transfer the sessions online in response to the COVID-19 pandemic enabled exploration as to how the children, their parents, and the trainers

experienced engaging in the sessions online compared to face-to-face. Subthemes emerging under this theme included time, learning opportunities, group cohesiveness, technical issues, distraction, support and prompts, participation opportunities, and motivation. Parents believed their children *'got more out of it [KONTAKT™] in the face-to-face sessions'* and that the children *'missed the face-to-face sessions'*. Trainers mentioned that some parents found it difficult *'to get them [the child] to come to the Zoom [online sessions]'* or that the child *'did not want to be on screen'*. One parent mentioned that having the session online was more convenient as *'it fitted better'* into their schedule.

Almost all children expressed that, overall, it was *'better'* when the sessions were delivered in person, especially the opening, closing, and discussion rounds. Only one child liked both delivery formats *'the same'*. Although most participants preferred having their *'own snacks'* for Snack Time, a few missed the time when they *'all had the same snack'*, saying they sometimes craved other participants' snacks.

While parents generally agreed that their children benefitted more from the face-to-face sessions, three parents expressed that their children *'benefitted from the online one too'*, with two feeling it improved their *'computer skills'* in addition to their social skills. The children echoed these sentiments, noting that the benefits of face-to-face sessions *were 'making better connections with the other participants'* and *'talking about what happened in the group'*, noting that it was hard to *'really look at someone in the eye when you are talking to them online'*. Parents also *'struggled'* with getting their children to *'do the sessions online'*, as they refused *'the actual sitting down in front of a computer.'*

All participants, the children, their parents, and the trainers, noted that *'being distracted'* was the most significant barrier to engaging in the online sessions of KONTAKT™. Distractors included siblings, sitting in open-plan living areas, toys, devices, and even the features of the online platform. Trainers and parents reported finding it *'really hard'* to get the children *'engaged'* and *'interested'* during the session as they had to *'wait for their turn'* during the online sessions. Children found turn-taking the most challenging aspect of engaging in KONTAKT™ online, saying they got bored waiting.

Trainers found it *'a bit trickier to get it all done in the [online sessions]'*, expressing a need for longer sessions, finding managing the online groups difficult when participants were excited and more talkative. While trainers felt they *'started off [a session] very much with positive behaviour support'*, they felt they often needed to take a *'more direct'* approach, even asking some participants to directly *'stop talking'*. Trainers also described having to *'ask everyone else to be quiet to address*

one child in the group', feeling they *'could not support them [the children online] the way that they needed to be supported'*.

Theme 3 - Personal factors. Personal factors described individual differences across participants, including gender, age, personality, trust and social awareness. Although parents were happy to have a mixed group, those with daughters described wishing for *'an all-girls group'*. They felt their daughters preferred to have male friends, as *'with boys, there's less of that social pressure. They are interested in running around ... not so interested in sitting and having a chat'*. They perceived that the discussion topics in all-girl groups *'might be quite different to the ones' used for boys. Parents of girls felt that 'girls are more verbal' and, therefore, 'target[ing] verbal communication is more appropriate for them [girls]'*.

Some children found the rounds requiring verbal communication more challenging. Several children found trusting others challenging, feeling their groupmates were not *'being honest at all'* or did not like disclosing information about themselves. Parents believed children who were older or more mature *'might have benefited more'* from KONTAKT™, believing they could be more *'self-aware'*. Parents and trainers also noted differences across participants and their social awareness, noting that some children did not like *'talking and thinking'* about their thoughts and feelings, while others were more verbal and engaged more actively with the content.

Theme 4 - Group Context. Experience with the group summarises how the participants, their parents, and trainers believed factors such as the global COVID-19 pandemic, the trainer's flexibility during the sessions, and having autistic peers had affected the children. Parents believed that besides the stress associated with family members getting sick with COVID, the *'children were living their best life during lockdown'* and it was easy for them to get *'oriented'* with the program. Parents and children felt *'it was nice to be able to come somewhere'* that everyone was diagnosed with autism. They believed the children felt *'included, and they all kind of got each other and understood that you didn't have to be the same'*. The trainer's flexibility regarding how they communicated with each participant was important to the children, noting:

'They knew how to talk to me, personally. And then when they went to another, they talked to her in the way that she liked better.'

Step 3: Applying Required Changes to KONTAKT™

Findings from this study supported the feasibility and acceptability of delivering KONTAKT™ to Australian autistic children within community service, suggesting minor modifications. These

adjustments included (1) extending the duration of the session to 75 minutes, (2) rephrasing some of the wording to make the text more readable for younger children, (3) adding information about the sessions to the parent workbooks and providing more information about how they could support their children, (4) amending some of the topics and role-play scenarios to be more age-appropriate (23).

Discussion

Despite the strong evidence supporting the efficacy of the KONTAKT™ social skills program for autistic adolescents (12 to 18 years), the feasibility of the program for a younger age group (8 to 12 years) was largely unknown. This study planned to address this need by systematically exploring the cross-age adaptability of the 16-session variant of KONTAKT™ previously assessed for Australian autistic adolescents (19) for children aged 8 to 12. Findings from the focus groups and the measurement framework of the current study supported the feasibility of KONTAKT™ for a younger population, aligning with the focus areas suggested by Bowen et al. (2009) (24). This study demonstrated that (1) KONTAKT™ was acceptable to all stakeholders; (2) it had significant demand in Western Australia; (3) it could be implemented within a community setting; (4) it was practical for families to attend KONTAKT™ sessions, especially when delivered in an in-person format; (5) beyond minor language modifications and increasing the length of the sessions, KONTAKT™ could be adapted to the needs of autistic children based on the context it is delivered in; (6) the community service provider was able to integrate KONTAKT™ into their services sustaining the delivery of the program beyond this study; (7) as an evidence-based program, delivery of KONTAKT™ can be expanded to other service providers; and, (8) KONTAKT™ demonstrated preliminary efficacy in supporting autistic children to achieve their personally meaningful goals.

Children completing the program, their parents, and the KONTAKT™ trainers all expressed high satisfaction with the content and structure of the program (acceptability), regardless of the delivery mode. This was evidenced by the high fidelity reported by the trainers. They requested minor changes to the content and structure originally used for adolescents, suggesting the relevance of the program for the broad age range of 8 to 18 years (adaptability). For example, children were able to complete the KONTAKT™ assignments, originally developed for adolescents, either on their own or with support, indicating the appropriateness of the topics for both age groups (adaptability). Stakeholders suggested the program could further be

improved by (a) increasing the duration of the session from 60 to 75 minutes (trainers and children); (b) developing role play scripts that reflected the children's everyday social needs (trainers); (c) provide more support materials for the trainers to support the children (trainers); (d) provide more information in the parent workbooks about the sessions, specifically in relation to how they could further support their children while attending KONTAKT™ (parents).

This study addressed a limitation of existing literature, utilising a child-centric approach in assessing the feasibility of the KONTAKT™. This approach ensured children's voices and values were incorporated into the adaptation of the program, respecting their dignity and social intelligence (5,23). The measurement framework allowed insight into children's self-determined personally meaningful social outcomes, their motivation, enjoyment and social interaction anxiety and their perceived experiences of the program while attending it. Findings from this measurement framework suggested that in line with previous research, KONTAKT™ is feasible for delivery to Australian autistic children (19). After adapting the activities of the program for a younger group, the children in the present study perceived they made substantial progress towards their personally meaningful social goals (preliminary efficacy), echoing previous findings for adolescents (19). Parents also believed that during the time they had observed their children, they seemed to be significantly more aware of their everyday social worlds, echoing previous evidence for SSGPs (9,11,48). These findings suggested the robustness and sensitivity of some outcome measures for assessing change in children's behaviour. Echoing findings for an adolescent cohort (19), the children in the present study were able to set their own personally meaningful social goals, although they may have needed more support and prompting from the researchers. The high response rate to the weekly texts demonstrated the appropriateness of the methodology for collecting data from children and their families regarding motivation, engagement, and interaction anxiety while attending the program session. Intrinsic motivation is a key factor in encouraging individuals to attend a support program such as SSGP, as it fosters participants' engagement with the program and enhances learning outcomes (49). Although some studies on SSGP efficacy (e.g., KONTAKT™) have identified intrinsic motivation as an eligibility factor (11), this study is the first to explore how children's motivation changes across SSGP sessions, contributing to the broader body of knowledge. These quantitative findings matched the joy and engagement the children expressed in the focus groups. Intraclass correlation demonstrated a good

to excellent average measure agreement between informants (parent-child dyads) for GAS, motivation, and engagement, indicating children, like adolescents, may be capable of reporting on their intentions (49,50).

A high load of expressions of interest received for an upcoming RCT evaluating the efficacy of KONTAKT™ for Australian children compared to an active control group indicated the high demand for the program. These findings align with the number of families pursuing such programs for their children in Australia (51). Although this study and the anticipated RCT required less than 10 trainers, AAWA requested more than 30 of their staff to be trained (demand). AAWA was anticipating that, like the previous version of KONTAKT™ evaluated for adolescents, they would adapt the program as part of their everyday services (Integration).

The onset of COVID-19 interrupted the in-person delivery of the program. Consequently, more than half of the KONTAKT™ sessions in this study were delivered online, causing a noticeable participant dropout rate (40%). Those discontinuing the study expressed satisfaction with the KONTAKT™ program (acceptability), citing access to resources and online delivery as the sole barrier for ceasing attendance. The remaining participants had a high attendance rate (89%), completing the program. Children and their parents expressed a significant increase in children's motivation to attend the program regardless of the delivery format. These findings, along with children's perceived progress toward their goals, added to the greater body of literature suggesting benefits associated with telehealth programs for autistic children (52). Findings indicated that regardless of stakeholders' satisfaction with the SSGP, the in-person delivery is still perceived as more acceptable and beneficial.

Methodological limitations and future research

The findings of this study must be considered in light of the following limitations. Although valuable feedback from the focus groups guided the necessary changes to the program, due to time constraints related to acquiring the necessary ethical approvals, autistic children were not recruited for the working group. Future research would benefit from having these stakeholders involved in all the stages of research and SSGP development (11,23). This study employed an uncontrolled single-group pre-test and post-test design. The small number of participants and lack of randomisation, lack of comparison to a control group, and blinding, limits the generalisability of findings. To address this limitation, a large, randomised control group with an active control group is currently being delivered to explore the efficacy of KONTAKT™ for autistic children.

COVID-19 restrictions and lockdowns resulted in the need to deliver half of the sessions online. A significant number of children withdrew from the study, limiting the complete understanding of the true feasibility of the program. Despite using the same content across both face-to-face and online formats, the effect of the delivery mode remains unknown. Future research would benefit from a child-centric randomised controlled trial comparing the two delivery formats (in-person/online), providing evidence for the efficacy of the telehealth-delivered social skills programs for autistic children.

Conclusion

The current study established the cross-age adaptability of the KONTAKT™ program for Australian autistic children, preparing it for further evaluation. This study is amongst the few that have taken a child-centric approach to assessing the feasibility of an SSGP. Findings supported the robustness of the primary outcome measures, providing preliminary evidence that autistic children, like adolescents, may be reliable informants when reporting on their behaviour. Notably, a rigorous approach is required to further investigate the efficacy of KONTAKT™ for autistic children in an Australian context and the generalisability of its findings..

Conflict of interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

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