

The Impact of Parental Collaborative Care on Alleviating Cardiovascular Risk Factors in Adolescents

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Abstract: *Objective:* This study aimed to comprehensively explore the effect of parental collaborative care on mitigating cardiovascular risk factors in adolescents, encompassing the multifaceted collaborations with partners, healthcare professionals, and support networks. *Methods:* A prospective cohort design was employed, involving 154 parents of adolescents with high cardiovascular risk. Participants were randomized into an intervention group (n=80) and a control group (n=80). The intervention group received collaborative care following the diagnosis of their children's high cardiovascular risk, while the control group parents did not receive any specific intervention. Cardiovascular risk assessment was conducted through a school-based sampling survey, with parental consent obtained. Data collection involved a three-month follow-up period, with telephone interviews conducted to assess parent satisfaction and problem-solving rates. A collaborative care questionnaire was developed to explore parents' experiences in collaborative caregiving. *Results:* The demographic characteristics of parents in both the intervention and control groups were comparable, with no significant differences observed in gender distribution, age, marital status, education levels, and family incomes. Parents in the collaborative care group reported significantly higher levels of satisfaction and problem-solving rates compared to those receiving common nursing intervention. The most commonly expressed concerns by parents were related to communication, stress management, and parenting tasks. However, control group parents exhibited higher rates of asking questions about problem-solving parenting issues and their children's exams, health, or care plan. *Conclusion:* Collaborative care was associated with increased parent satisfaction and problem-solving rates among parents of adolescents with high cardiovascular risk. These findings highlight the potential benefits of incorporating collaborative care strategies in the management of pediatric patients with cardiovascular risk and their families. Further research is needed to explore the specific components of collaborative care that contribute to improved outcomes and identify areas for refinement to optimize its effectiveness.

Keywords: Cardiovascular Risk Factors, Adolescents, Nursing

1. Introduction

Youth is an important period of life in which lifestyle habits are likely to be carried to further life stages, and a high prevalence of risk factors in adolescents is observed [1-3]. It was reported that parental behaviors, such as smoking, alcohol consumption and low physical activity level, were associated with higher cardiovascular risk factors in their children [4].

Yang et al. [5] found that children and adolescents in China

with overweight parents were more likely to develop metabolic syndrome. Vázquez-Rodríguez et al. [6] observed a relationship between parental smoking and smoking in their Mexican adolescent children, and a similar association was found between high alcohol consumption by parents and adolescents [7]. Conversely, adolescents are more likely to adopt healthy lifestyle habits if their parents model such behavior. For example, a study of Brazilian adolescents found

that those with active mothers and fathers were more likely to be physically active themselves [8]. Schoeppe et al. [9] observed that an active lifestyle in mothers, including participation in sports and active commuting, was associated with greater sports participation and active commuting in their children. Moreover, physical activity has been inversely associated with a range of cardiovascular risk factors, including obesity, hypertension, smoking, and alcohol consumption, in both adults and adolescents [10-13, 14-17]. Based on this premise, it is hypothesized that the association between cardiovascular risk factors in adolescents and their parents could be mitigated if both generations engage in regular physical activity, particularly when compared to less active parents.

Although these studies provide valuable insights into reducing cardiovascular risk factors in adolescents through lifestyle changes, there is still a lack of research exploring areas of collaborative care efforts, especially with partners, healthcare professionals, and support networks. Therefore, the primary aim of this study is to comprehensively explore the impact of parental collaborative care on alleviating cardiovascular risk factors in adolescents, encompassing the multifaceted collaborations with partners, healthcare providers, and support networks.

2. Methods

2.1. Study Design

This study employed a prospective cohort design to investigate the effect of parental collaborative care on alleviating cardiovascular risk factors in adolescents.

2.2. Participants

A total of 154 parents of adolescents had high cardiovascular risk were included in the study. After randomization, the participants were divided into an intervention group (n=80) and a control group (n=80). The intervention group received collaborative care following the diagnosis of their children's high cardiovascular risk. The control group parents did not receive any specific intervention. Throughout the study process, six cases were excluded due to loss of contact, resulting in a final analysis with 78 participants in the control group and 76 participants in the intervention group.

2.3. Cardiovascular Risk Assessment

Cardiovascular risk assessment comes from a school based sampling survey. Contacted the principals of each selected school and informed them of the research objectives. Subsequently, the researchers explained the research objectives to students in class and invited teenagers to participate. Teenagers who agreed to participate received a parental consent form authorizing participation in the study.

2.4. Informed Consent and Follow-Up

All participants were parents of adolescents had high cardiovascular risk. They provided informed consent and agreed to participate in the research, including a follow-up period of three months. Data collection was conducted through telephone follow-up interviews.

2.5. Collaborative Care Questionnaire

A research group consisting of four nurse researchers, a developmental psychologist, a developmental scientist, cardiovascular specialist, and an expert in the use of the Qualtrics online survey platform developed a questionnaire for online administration. The questionnaire, titled "Parent Survey of Needs for Learning About Working Together," aimed to assess parents' experiences with collaborative caregiving. It comprised 24 items related to 10 issues concerning working with the partner, nine issues related to the infant's healthcare clinicians, and five issues related to substitute caregivers. The questionnaire items were developed based on relevant literature on parental caregiving for cardiovascular risk of adolescents [18, 19], as well as insights from previous research [20] and the clinical expertise of the instrument developers. Participants were also given the opportunity to report additional caregiving issues not covered by the provided items.

2.6. Statistical Analysis

Statistical analysis was conducted using SPSS 22.0. Frequency distributions were utilized to describe binomial components (e.g., concern, desired help, sources of help within help categories) and ordinal categorical items (e.g., importance, difficulty). The relationship between ordinal categories of importance and difficulty was examined using doubly ordered contingency tables. The threshold for statistical significance was set at $p \leq 0.05$.

3. Results

Table 1 presents the demographic characteristics of parents whose children had high cardiovascular risk. The characteristics of participants in the intervention and control groups were comparable, with no significant differences observed. The distribution of parent gender was similar between the two groups, with approximately half of the parents being females (53.8% vs. 52.6%). The majority of respondents were single parents completing the survey (94.9% vs. 93.4%). The mean ages of parents in the control and intervention groups were 37.4 ± 11.7 and 36.1 ± 10.9 , respectively, demonstrating similar age distributions. Regarding marital status, both groups exhibited comparable patterns, with the majority of responding parents being married (84.6% vs. 89.5%). Education levels and family incomes were also similar between the two groups.

Table 1. Parent characteristic of infants.

	Control group (n=78)	Intervention group (n=76)	P value
Parent gender, female	42 (53.8%)	40 (52.6%)	> 0.05
Only one parent responded to the survey	74 (94.9%)	71 (93.4%)	> 0.05
Age of parent (year) (mean±SD)	37.4±11.7	36.1±10.9	> 0.05
Marital status of responding parent			> 0.05
Single	3 (3.8%)	2 (2.6%)	
Unmarried/partnered, not living with partner	1 (1.3%)	1 (1.3%)	
Unmarried/partnered, living with partner	8 (10.3%)	5 (6.6%)	
Married	66 (84.6%)	68 (89.5%)	
Separated/divorced	0 (0.0%)	0 (0.0%)	
Education, n (%)			> 0.05
≤12th grade or high school graduate	34 (43.6%)	31 (40.8%)	
College 1-3 years or more	44 (56.4%)	45 (59.2%)	
Family income, n (%)			> 0.05
< \$20,000	17 (21.8%)	14 (18.4%)	
\$20,000 - \$40,000	22 (28.2%)	18 (23.7%)	
\$40,000 - \$60,000	12 (15.4%)	19 (25.0%)	
> \$60,000	27 (34.6%)	25 (32.9%)	

Table 2 displays parent satisfaction and problem-solving rates among patients receiving common nursing intervention versus collaborative care. Patients receiving collaborative care reported higher levels of parent satisfaction and a greater

problem-solving rate compared to those receiving common nursing intervention. These differences between the two groups were statistically significant.

Table 2. Parent satisfaction and problem solving rate.

	Control group (n=78)	Intervention group (n=76)	P value
Parent satisfaction (score)(mean±SD)	4.7±3.5	8.4±2.3	0.004
problem solving rate, n (%)	42 (53.8%)	71 (93.4%)	<0.001

Table 3 presents the caregiving issues identified by parents as areas of concern. Among all the issues, the most commonly expressed concerns by parents were related to "Talking together about handling stress," "Talking together about changes in our lives," and "Communicating about what is happening with the children and the family." Compared to the control group, a higher percentage of parents in the

intervention group expressed concerns about parenting tasks (44.9% vs. 86.8%). However, a larger proportion of control group parents reported asking questions about "Problem-solving parenting issues" (74.4% vs. 31.6%) and "Asking questions about the children's exams, health, or care plan" (87.2% vs. 42.1%).

Table 3. Caregiving issues identified by parents as a concern. n (%).

	Control group (n=78)	Intervention group (n=76)	P value
Parents working together (Spouse/Partner relationship)	36 (46.2%)	41 (53.9%)	>0.05
Communicating about what is happening with children, family	52 (66.67%)	48 (63.2%)	>0.05
Getting parenting tasks done	35 (44.9%)	66 (86.8%)	<0.001
Handling differences between us in taking care of children	37 (47.4%)	40 (52.6%)	>0.05
Handling responses of family members	33 (42.3%)	31 (40.8%)	>0.05
Problem - solving parenting issues	58 (74.4%)	24 (31.6%)	0.009
Asking questions about children's exam, health, or plan of care	68 (87.2%)	32 (42.1%)	<0.001
Promoting family recreation and good times together	33 (42.4%)	38 (50.0%)	>0.05
Resolving disagreements about parenting	27 (34.7%)	24 (31.6%)	>0.05
Talking together about changes in our lives	56 (71.8%)	53 (69.7%)	>0.05
Talking together about handling stress or distress	66 (84.6%)	68 (89.5%)	>0.05

4. Discussion

In this study, we investigated the impact of collaborative care on parent satisfaction and problem-solving rates among parents of children with high cardiovascular risk. The demographic characteristics of parents in both the intervention and control groups were comparable, with no significant differences in terms of gender distribution, age, marital status, education levels, and family incomes (Table 1). This

similarity in demographic characteristics suggests that the observed effects can be attributed to the intervention itself, rather than any confounding factors.

As shown in Table 2, parents in the collaborative care group reported significantly higher levels of satisfaction and problem-solving rates compared to those receiving common nursing intervention. This finding highlights the potential benefits of implementing collaborative care approaches in supporting parents of children with high cardiovascular risk. It is possible that the increased communication and shared

decision-making facilitated by collaborative care contribute to greater satisfaction and problem-solving capabilities among parents.

Analysis of caregiving issues identified by parents in Table 3 revealed that the most commonly expressed concerns were related to communication and coping with stress and changes. Interestingly, a higher percentage of parents in the intervention group expressed concerns about parenting tasks compared to the control group. This finding may suggest that collaborative care enhances parent awareness and engagement in managing their children's health, leading to a greater focus on parenting challenges.

However, it is noteworthy that a larger proportion of parents in the control group reported asking questions about problem-solving parenting issues and their children's exams, health, or care plan. This discrepancy may indicate that although collaborative care improves overall satisfaction and problem-solving rates, there may be specific aspects of information-seeking and communication that require further attention and refinement in the collaborative care approach.

5. Conclusion

In conclusion, our findings demonstrate that collaborative care is associated with increased parent satisfaction and problem-solving rates among parents of children with high cardiovascular risk. The results underscore the potential benefits of incorporating collaborative care strategies in the management of pediatric patients with high cardiovascular risk and their families. Future research should continue to explore the specific components of collaborative care that contribute to improved outcomes and identify areas for further improvement to optimize its effectiveness.

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