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'Dealing with It in a Way That Works for You': Adolescent Perspectives on Defining Coping in the Context of Pediatric Chronic Pain

--Manuscript Draft--

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Abstract:	Objectives: Coping is essential in managing pediatric chronic pain, yet current conceptualizations overlook its complexity and the lived experiences that shape it. The objectives of this study were two-fold. We investigated: (1) adolescents' definitions on coping and (2) their perspectives on the integrative model, a proposed framework that draws from the broader coping literature to characterize variability in pain coping. Methods: Twenty-one adolescents ages 14-19 years old with chronic pain from Canada, the United States, and United Kingdom participated in semi-structured interviews concerning their understanding of coping (objective 1) and feedback on the integrative model (objective 2). Targeted recruitment through online platforms, pain clinics, and organizations serving gender and ethnic diverse youth were used to capture diverse perspectives. Data were analyzed using reflexive thematic analysis (objective 1) and qualitative content analysis (objective 2). Results: For objective 1, two themes were generated. Theme 1, "dealing with it in a way that works for you", described how adolescents view coping as an active, personal process involving effort and trial-and-error, occurring with or without conscious awareness. Theme 2, "coping should help but doesn't always" captured how coping is often portrayed as inherently positive, but outcomes can be unhelpful or ineffective. For objective 2, the content of the integrative model generally resonated with adolescents and was viewed as useful for improving coping interventions. Some revisions were suggested. Conclusions: Adolescents with chronic pain hold personal, nuanced understandings of coping. Aligning healthcare providers' perspectives with patients may enhance clarity and ultimately support better outcomes.

Highlights

- Adolescents' view coping as an active, personal process but does not require conscious awareness.
- Coping outcomes can be short- and/or long-term; they are intended to be helpful but are not always.
- Adolescents agree with integrative model's view of coping as flexible process shaped by many factors.
- The integrative model and definition of coping were adapted based on adolescent perspectives.
- Research and clinical practices should account for personal and situational variability in the coping process.

Dear Dr. Palermo,

Thank you for your thoughtful consideration of our manuscript, “Dealing with It in a Way That Works for You: Adolescent Perspectives on Defining Coping in the Context of Pediatric Chronic Pain.” We are grateful to you and the reviewers for the time and care taken to provide detailed and constructive feedback.

We appreciate the reviewers’ recognition of the manuscript’s strengths, including its clarity and rigorous qualitative methodology. We have carefully considered all comments and have undertaken substantial revisions to strengthen the manuscript accordingly.

The most substantial changes reflected in this revision include:

- Clarified the study rationale and more explicitly articulated the current gap in knowledge addressed by this work;
- Reorganized the manuscript into a single study (vs. two parts) to enhance clarity;
- Expanded the description of qualitative content analysis coding and procedures to evaluate trustworthiness in the supplemental materials to increase transparency in our approach and rigor;
- Strengthened and refined the Discussion to better situate our findings within the existing literature and highlight their implications.

A detailed, point-by-point response to all reviewer and editor comments is provided below in this document, including specific page references and excerpts from the revised manuscript to indicate where changes have been made (purple font below). A tracked-changes version and a clean version of the revised manuscript have been re-submitted, as requested.

We believe these revisions have significantly improved the clarity and contribution of the manuscript, and we hope it is now suitable for publication in *The Journal of Pain*. We appreciate the opportunity to revise and resubmit our work and look forward to your feedback.

Thank you again for your time and consideration.

Sincerely,
A. Natisha Nabbijohn, MA
University of Guelph

On behalf of all co-authors

Responses to Review Comments

Reviewer #1:

Thank you for the opportunity to review this manuscript which describes a study exploring adolescent perspectives on coping with paediatric chronic pain. The authors recruited 21 adolescents aged 14-19 from the US, UK and Canada to participate in semi-structured interviews. The objectives were to investigate adolescent perspectives on coping and also to provide feedback on an integrative theoretical model of coping for this age group. This is a very novel and interesting study and findings highlight how current theories/definitions of pain do not account for the cyclical process that coping can be or the complexities which can influence different aspects of coping for adolescents. I particularly found it interesting how current literature defines coping success as only positive, whereas adolescents highlight that sometimes coping outcomes can be negative. My peer-review comments are mainly about strengthening the rationale for the different components of the study (Part 1 and Part 2) and also about restructuring Part 1 and 2 by integrating them together throughout, rather than partial integration and partial separation, which makes the paper hard to follow mid-way through:

We thank you for taking the time to review our manuscript and for recognizing its various strengths. We also appreciate your recommendations for improving the rationale and overall flow of the manuscript. We hope that the revisions made in response to the specific comments below have adequately addressed these concerns.

Abstract

Comment #1: Authors highlight the second objective of the paper is to investigate: "their perspectives on the integrative model, a proposed framework that draws from the broader coping literature to characterize variability in pain coping". It would be good to give a bit more context here given this is the first part of the paper a reader will see. E.g., is this an existing model or a new model created by the team as a result of adolescent perspectives captured?

Response #1: We added the word “previously” to clarify that the framework already existed. This framework was developed by some of the authors involved in this manuscript through integrating existing theories, and the present study aimed to examine its validity by incorporating adolescent perspectives. Due to the limited word count for the abstract, we are unable to provide this level of detail there, but we elaborate further in the Introduction.

Comment #2: The statements about adolescent perspectives on the integrative model in the abstract are rather vague: "model generally resonated with adolescents and was viewed as useful for improving coping interventions. Some revisions were suggested." I know there is limited word count but this really needs some context I think. Particularly what resonated and an example of a suggested revision to the model would be useful?

Response #2: We have revised these two sentences to be more specific as follows:

> Page 2: “For objective 2, adolescents identified strengths and improvements for the integrative model related to clarity/accessibility, alignment with lived experiences, and supporting coping plans. For example, while adolescents described the model helpful and easy to understand, they suggested ways to depict the model visually and with greater flexibility to fit different situations. Results led to a new definition of coping and revision of the integrative model to align with adolescent perspectives; advancements for clinical practice are discussed.”

Comment #3: "Aligning healthcare providers' perspectives with patients may enhance clarity and ultimately support better outcome". I think this is a big discussion point in and of itself but in the abstract, it is not clear why this would be important or useful. I think it would be better to save words on this sentence and use those words to expand on the feedback I have suggested in the previous comment. I think it would be nice to see a bigger discussion about this in the general discussion of the paper, but I did not see this mentioned there?

Response #3: Within the constraints of the abstract word limit and balanced with the other requested changes, we made edits to address this feedback as follows: .

> “Results led to a new definition of coping and revision of the integrative model to align with adolescent perspectives; advancements for clinical practice are discussed.”

Within the manuscript, we also expanded our discussion to include more explicit comments regarding clinical practice on pages 39-40 as follows (also **see our Response #30 below**).

> Page 39-40: “The results of this study suggest that adolescents’ perspectives on coping with chronic pain align with the flexible, process-oriented conceptualization offered by the integrative model. Adolescents perceive coping as always active and personal, but can vary in terms of how intentional and helpful it can feel. Through incorporating adolescent perspectives into the model, this study offers conceptual clarity and language to align the perspectives of adolescents living with chronic pain with other stakeholders’ perspectives (e.g., researchers, clinicians, caregivers). Based on these insights, it is critical that research and clinical discussions shift from prescribing “correct” strategies toward collaboratively exploring coping in patient-centered, goal-oriented ways. Specifically, researchers and clinicians may want to avoid relying solely on questionnaires or framing coping responses as either “adaptive” or “maladaptive” without having discussions with youth to capture their personal goals and appraisals as well as information about situational factors impacting their coping… Within clinical contexts, the integrative model may help to provide psychoeducation that increases patients’ self-awareness and offers validation of how coping with chronic pain is complex and challenging. Healthcare providers guided by this model may consider a nonjudgmental, open stance focused on understanding the patient’s goals and factors shaping their coping preferences and outcomes thereby facilitating individualized coping plans that when practiced may translate into more effortless and sustainable coping habits over time.”

Introduction

Comment #4: "A primary aim of psychological interventions is promoting coping skills (4,5)"- the context of chronic pain needs adding to this statement.

We adjusted this sentence as follows:

> Page 3: “A primary aim of psychological interventions for pediatric chronic pain is to promote effective coping (4,5)”

Comment #5: "yet, evidence-based practices for pain coping are limited by inconsistent conceptual models which do not apply well across individuals."- Do the authors mean do not apply well across adolescents rather than individuals or is the scoping review they are referring to across all age ranges? Being more specific here about the limits of this scoping review would be helpful.

Comment #6: "Specifically, a scoping review of pediatric pain coping identified numerous measures, including 22 questionnaires with documented psychometric properties, and only 7.2% of studies guided by theory (6)."- It would be good to expand upon what these measures were found to be based upon e.g. where they based on adolescent perspectives or something else, if not theory? Also, what is the significance of psychometric properties here? Do the authors mean the measures have been explored psychometrically BUT only 7.2% of measures were based upon theory?

Comment #7: "Moreover, no theory and only five questionnaires were developed in pediatric chronic pain populations (6)."- I do not understand this sentence? This relates to my comment number 2 ***(re-labelled as #5 in this response letter)*** but is the scoping review authors are referring about measures across different age ranges rather than adolescent specific?

Response to Comments #5-7: Reviewer 1’s comments #5-7 all suggest that our previous description of the scoping review by Nabbijohn et al. (2021) was not clear in terms of the population/age range and meaning of the results we discussed. We have fully revised this section to explicitly specify the population captured in the review (i.e., pediatric chronic pain literature, ages 0–21) and to highlight the key findings of the scoping review.

Rather than detailing the number and types of questionnaires identified, we refocused the description on findings most relevant to the current study. Specifically, we emphasize that few studies were guided by theory (as in they did not cite a theory for explaining their choice in measures and interpretation of results) and that existing theories have not been developed or validated within pediatric chronic pain samples. We also highlight the review’s identification of an overreliance on questionnaire-based methods, which limits insight into the situational and personal factors shaping coping.

This section now reads as:

> Page 3: “A recent scoping review of the pediatric (ages 0–21) chronic pain coping literature identified key conceptual gaps (12). First, fewer than 10% of studies cited a theory, and no theories were developed or validated among youth with chronic pain

> specifically, which is important given that pain in this context is often less predictable and controllable than for chronic illnesses (9). Second, existing models categorize coping responses by type (e.g., distraction, problem-solving) and as “adaptive” vs. “maladaptive”, despite evidence suggesting coping varies across individuals and contexts. The predominance of female Western samples (12) further limits generalizability. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of “passive and maladaptive” (13). Lastly, an overreliance on quantitative methods (e.g., questionnaires) for conceptualizing coping limits insights into factors shaping coping.”

Comment #8: "However, previous studies asked adolescents about their experiences living with chronic pain rather than their definitions of coping."- This seems like a very important nuance highlighting this studies novelty vs previous studies novelty. However, the authors do not justify why it is important to understand definitions of coping outside of the context of lived experience here. This especially contradicts with the statement made in the abstract about: "current conceptualizations overlook its complexity and the lived experiences that shape it", as authors are highlighting that lived experiences have been explored in previous studies. The novelty and importance of this paper needs teasing out more clearly here.

Response #8: We thank the reviewer for raising these areas which required improvement in clarity. We have revised this section to clarify both the contributions of prior research and the gap our study addresses. Specifically, we highlight how understanding how adolescents themselves define “coping,” rather than only examining their lived experiences, is important because it allows researchers and clinicians to discuss coping in ways that are meaningful to adolescents and ensures that theoretical representations, interventions, and supports are relevant and effective.

This section now reads as:

> Page 4: “A recent systematic review of qualitative studies involving young people (ages 12-24) with chronic pain advanced our understanding of adolescent experiences living with chronic pain and provided insight into common coping responses reported in qualitative research (18). Overall, chronic pain was described as both disruptive and identity-shaping, with young people perceiving their lives as markedly different from their peers; for example, these youth often miss out on opportunities for social and economic growth and depend on caregivers (19). Coping responses reflected self-directed efforts (e.g., distraction) and external supports (e.g., family/friends), tailored to developmental needs, suggesting that effective support balance fostering autonomy with shared decision-making alongside healthcare providers (18). However, youth-informed theories linking lived experiences to coping response selection are limited (18), as only one study provided insight into a model grounded in adolescents’ lived experiences (20). This study, focused on adolescents with arthritis, identified how “maintenance” (normalizing pain) and “management” (reducing pain) coping goals

> shape coping responses, underscoring the importance of adolescents' motivations in coping. Yet, adolescents' personal definitions of "coping" in the context of chronic pain remains unexamined, limiting our ability to judge the conceptual alignment among patients, researchers, and healthcare providers. Efforts to incorporate adolescents' perspectives into theory may help to advance more meaningful and relevant research and clinical practices."

Comment #9: "Capturing adolescents' language is essential for creating a conceptualization that resonate with patients"- grammar issues. 'Resonates' with adolescents. I also do not see much consideration to how the authors used adolescents language in the findings when they create the new model (Figure 3). How did authors do this?

Response #9: Thank you for this comment. The proposed definition and model (Figure 3) in the discussion is informed by adolescents' underlying ideas and perspectives as identified during analysis, rather than direct use of their language. We have revised the wording to "perspectives" throughout the manuscript. As we did not use adolescents' exact wording when creating the model, this change more accurately reflects the approach we adopted in this study. The exact sentence you are referring to has been removed in the process of revising this manuscript; however, here is example of how the adjusted the language to "perspectives":

> Page 5: "Efforts to incorporate adolescents' perspectives into theory may help to advance more meaningful and relevant research and clinical practices."

Comment #10: I think the current definition of coping comes a little too late in the introduction and should be somewhere in the first paragraph at least.

Response #10: We agree that it is important to have the current definition as early as possible in the manuscript. In our rewrite of the Introduction, the definition now appears in the first paragraph, which reads as:

> Page 3: "Chronic pain is prevalent in adolescents (ages 10–18) exacerbating a period of already heightened psychosocial vulnerability (1–3). A primary aim of psychological interventions for pediatric chronic pain is to promote effective coping (4,5), **defined as the 'use of intentional and effortful thoughts or behaviors to manage the internal and external demands of stressful situations or experiences'** (6,7)."

Comment #11: "These conceptualizations fail to capture the multifaceted nature of coping (i.e., stressor, intention, action, and outcomes)"- I think each of the "i.e.'s" here need expanding upon for a reader who is not well versed in coping literature.

Response #11: Given limitations in word count and changes we made to address other comments, we have removed this sentence from the introduction. Instead, we more simply point out the complex and multifaceted nature of the concept of the coping after stating the definition by saying:

> Page 3: “A primary aim of psychological interventions for pediatric chronic pain is to promote effective coping (4,5), defined as the 'use of intentional and effortful thoughts or behaviors to manage the internal and external demands of stressful situations or experiences' (6,7). **This definition demonstrates coping is a complex, multifaceted construct.**”

In addition, we also provide definitions of coping goals, responses, and outcomes later in the Introduction, as we describe in response to your Comment #12 below (see Response #12).

Comment #12: "Coping goals motivate coping responses; coping responses are cognitive or behavioral strategies employed whereas outcomes are the consequences of these responses, indicating an effective or ineffective coping attempt."- Coping goals are not defined in this example which would be helpful.

Response #12: We provide a definition for coping goals as requested. This sentence now reads as:

> Page 3-4: “Coping is operationalized as a process involving goals, responses, and outcomes (14,15): goals are one’s intentions for coping and motivate responses; responses are cognitive or behavioral strategies; and outcomes are the consequences of responses, indicating an effective or ineffective coping attempt.”

Comment #13: "an effective or ineffective coping attempt"- can a coping outcome also partially be effective and partially ineffective, rather than totally dichotomised? Or is this something that has only been identified in your findings, not in previous literature?

Response #13: Great question. Yes - in prior literature, coping outcomes are often presented dichotomously (“adaptive vs. maladaptive”), as stated in the second paragraph of the Introduction. The integrative model adapts this terminology to “effective vs. ineffective coping attempt” from Rudolph and colleagues (1995), aiming to soften the dichotomy by acknowledging that a coping response can be unhelpful in a single attempt without being inherently maladaptive. Our findings, however, are the first to highlight even greater nuance: youth frequently described both positive and negative outcomes from the same coping response (Theme 2: Coping Should Help But Doesn’t Always). Hence, we decided to keep the dichotomy approach in explaining coping responses within the introduction, and we explore this complexity further in the Results and Discussion.

Comment #14: "which help to understanding variability across people and situations."- Grammar- helps in understanding or help to understand.

Response #14: This quote was removed in the process of making other edits to the introduction.

Comment #15: "Motivational models emphasize the role of goals in shaping coping responses (13), whereas the transactional model suggests that person-environment interactions influence

coping responses and outcomes (14)"- Motivational models and transactional models are not really introduced clearly enough here. What are these models? Why are they relevant/important? More context needs to be provided as to their significance here.
Comment #16: "This model also incorporates biopsychosocial factors known to influence coping goals, responses, and outcomes."- Biopsychosocial factors, such as?

Response to Comments #15 and #16: Thank you for highlighting the need for greater clarity regarding the theoretical foundations of the integrative model. In response, within the limited word count available for the introduction, we have significantly revised this section to more explicitly describe the key elements of motivational and transactional models that inform the integrative model, and to clarify their relevance to coping in pediatric chronic pain. Specifically, we now note the role of goal-directed processes (e.g., needs for relatedness, competence, and autonomy) and person–environment interactions (e.g., situational demands and available resources) in shaping coping responses and outcomes. We have also incorporated examples of relevant biopsychosocial factors to further contextualize these influences (e.g., social context and cognitive capacity). Given space constraints, we focused on the components most central to understanding the integrative model, and we expand on these theoretical foundations further in the Discussion.

This section now reads:

> Page 3: “A recent scoping review of the pediatric (ages 0–21) chronic pain coping literature identified key conceptual gaps (12). First, fewer than 10% of studies cited a theory, and no theories were developed or validated among youth with chronic pain specifically, which is important given that pain in this context is often less predictable and controllable than for chronic illnesses (8). Second, existing models categorize coping responses by type (e.g., distraction, problem-solving) and as “adaptive” vs. “maladaptive”, despite evidence suggesting coping varies across individuals and contexts. The predominance of female Western samples (12) further limits generalizability. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of “passive and maladaptive” (13). Lastly, an overreliance on quantitative methods (e.g., questionnaires) for conceptualizing coping limits insights into factors shaping coping.”

Comment #17: "This two-part study reflects data from a larger qualitative interview project investigating adolescents' conceptualizations of coping and awareness of factors influencing coping with chronic pain"-It would be good to tell the reader more about the other aspects of this larger project, so readers can see how this specific piece fits into the broader programme of research being conducted.

We appreciate the suggestion to clarify how this study fits within the broader research program. In response, we have revised the text to situate the current study as the first of two drawn from a larger qualitative interview project examining how adolescents understand and use coping to manage chronic pain and specify the aims of both studies within this project. This section now reads as:

> Page 5: “This study is the first of two studies drawn from a larger qualitative interview project examining how adolescents understand and use coping to manage chronic pain. Here, we focused on adolescents’ (1) definitions of coping and (2) perspectives on a proposed conceptualization informed by the integrative model. The second study will explore adolescent perceptions of social identity and situational factors that shape coping and healthcare needs. Together, insight gained into adolescent perspectives on coping can inform more meaningful and effective theoretical representations, clinical discussions, and interventions.”

Comment #18: "These studies are the first to capture explicit definitions of "coping" from adolescents with chronic pain, which can help to integrate patient voices into theory."- Again, I do think there is a bit of contradiction between the novelty of this study vs previous work which is not coming across very clearly. It sounds like previous studies have explored adolescents lived experiences of what coping is, so in what was is asking adolescents to define what coping is different to those studies? Especially because a lot of the findings that are then presented throughout Part 1 and Part 2 are about adolescents lived experiences.

Response #18: As mentioned in Response #8, we made revisions that clarify both the contributions of prior qualitative research and the gap our study addresses. Specifically, understanding how adolescents themselves define “coping,” rather than only examining their lived experiences and from this deriving a definition or model of coping. It is important because by hearing directly from adolescents, it reduces the potential for researcher assumptions to drive the field’s definitions/theory. Understanding how adolescents define coping allows researchers and clinicians to discuss coping in ways that are meaningful to adolescents and ensures that interventions and supports are relevant and effective. We also updated the final paragraph on the objectives to clarify the current study aims and intended contribution.

These sections now read as:

> Page 4-5: “A recent systematic review of qualitative studies involving young people (ages 12-24) with chronic pain advanced our understanding of adolescent experiences living with chronic pain and provided insight into common coping responses reported in qualitative research (18). Overall, chronic pain was described as both disruptive and identity-shaping, with youth perceiving their lives as markedly different from their peers; for example, these youth often miss out on opportunities for social and economic growth and depend on caregivers (19). Coping responses reflected self-directed efforts (e.g., distraction) and external supports (e.g., family/friends), tailored to developmental needs, suggesting that effective support balance fostering autonomy with shared decision-making alongside healthcare providers (18). However, youth-informed theories linking lived experiences to coping response selection are limited (18), as only one study provided insight into a model grounded in adolescents’ lived experiences (20). This

study, focused on adolescents with arthritis, identified how “maintenance” (normalizing pain) and “management” (reducing pain) coping goals shape coping responses, underscoring the importance of adolescents’ motivations in coping. Yet, adolescents’ personal definitions of “coping” in the context chronic pain remains unexamined, limiting our ability to judge the conceptual alignment among patients, researchers and healthcare providers. Efforts to incorporate adolescents’ perspectives into theory may help to advance more meaningful and relevant research and clinical practices.

This study is the first of two studies drawn from a larger qualitative interview project examining how adolescents understand and use coping to manage chronic pain. Here, we focused on adolescents’ (1) definitions of coping and (2) perspectives on a proposed conceptualization informed by the integrative model. The second study will explore adolescent perceptions of social identity and situational factors that shape coping and healthcare needs. Together, insight gained into adolescent perspectives on coping can inform more meaningful and effective theoretical representations, clinical discussions and interventions.”

Methods

Comment #19: "The same data collection procedures, participants, and questionnaire data are used in both study parts"-Questionnaire data are mentioned here but only semi-structured interviews are mentioned in abstract. Also, questionnaire would be a data collection procedure so if questionnaires were used, why where they not included under the data collection umbrella term? This is confusing.

Response 19: Thank you for this helpful comment. This specific quotation has been removed following the merging of Parts 1 and 2 of the manuscript, as recommended in Comment 27 below.

That said, we want to clarify that the questionnaire was used solely to collect demographic information and characterize the sample. This is indicated by the subsection title “Demographic Questionnaire” and the stated purpose: “A questionnaire was developed to capture self-reported demographic data consisting of…”.

Similarly, the PROMIS® Pediatric Pain Intensity Measure was included only to characterize pain levels in the sample. To reduce emphasis on this measure and improve clarity, it has been removed as a standalone subsection and is now incorporated within the Demographic Questionnaire section. We have also added the clarifying sentence on Page 7: “The PROMIS® Pediatric Pain Intensity Measure (22) was administered to characterize pain intensity within the sample.”

In the abstract, we emphasize the semi-structured interview as the primary method due to space limitations and its central relevance, as questionnaires were used solely for sample characterization.

Comment #20: "(e.g., Comfort Ability Program)"- more context should be provided about these programs. Are these specific pain management programs at specific paediatric hospitals or something else?

Response #20: We revised this sentence to include additional examples and clarify that the programs comprise both clinical pain management interventions and non-profit patient support and advocacy organizations. This sentence now reads as:

> Page 6: "Participants were recruited through advertisements, snowball sampling, and word of mouth, both online (via social media) and within specialized pediatric pain-management programs (e.g., McMaster Children's Hospital, Stollery Children's Hospital, Comfort Ability Program) and non-profit patient support/advocacy organizations (e.g., Fibromyalgia Association Canada, National Migraine Centre, Versus Arthritis)."

Comment #21: "Demographic information collected were monitored by the lead researcher and used to seek representation of gender diverse and racial/ethnic minority adolescents."- How were the demographic information used to seek this representation? E.g. once you had recruited xxx of one group, did you purposefully try to recruit xxx of another group?

Thank you for this comment. While no formal quotas were applied, the study had soft targets of approximately 25% for gender-diverse/cis-gender male participants and 25% for racial/ethnic minority participants. Demographic information was monitored during recruitment to assess sample composition and inform outreach strategies. This included encouraging clinicians to be more mindful of certain demographics when sharing recruitment materials and extending recruitment through groups serving gender- and ethnically diverse adolescents. We have revised the manuscript to clarify this approach:

> Page 6: "While no formal quotas were applied, the study aimed for at least 25% gender-diverse, cis-gender male, and racial/ethnic minority participants given the known prevalence of these demographics presenting at pain clinics (21,22). Demographic information collected were monitored by the lead researcher to assess the sample composition and guide targeted outreach, such as asking clinicians sharing recruitment materials to be mindful of particular demographics and following up with recruitment within organizations serving gender and racial/ethnic diverse youth."

Comment #22: I am unclear why SES status was collected or why the PROMIS pediatric pain intensity measure was used. I can understand if SES status was captured to be able to provide some demographic information on the diversity of the participants. I can understand why the pediatric pain intensity measure might be used, if authors wanted to demonstrate a link between pain levels and coping perspectives potentially. But these materials currently do not feel justified or in line with the aims of the qualitative research methodology. I think these need justifying/a rationale being provided for their use and links to the research aim, or should be removed if they are not relevant to the aim of this specific paper (perhaps they are more relevant to another part of the larger project that has been mentioned?).

Response #22: Thank you for your feedback on the clarity of this information. While SES was not analyzed in the present study, it was collected to characterize the sample, as socioeconomic factors can influence access to resources that may shape coping experiences. Similarly, the PROMIS® Pediatric Pain Intensity Measure was included solely to describe pain levels in the sample, rather than to test hypotheses about coping. The following statement was added to clarify the purpose of the questionnaire:

> Page 7: "This information was collected and summarized in this study for the purpose of characterizing the sample to provide relevant background context for interpreting participants' experiences."

Comment #23: "A semi-structured interview schedule for the larger project was initially developed by ANN in consultation with CCM, LC, and AJ to extend previous research on coping"- It would be useful to expand on initial development steps and expand upon what ANN used as a basis (e.g. any previous research studies in particular, any theory in particular etc). Something must have been the basis of the questions asked/extended.

Thank you for this suggestion. We have revised the manuscript to provide greater detail on the development of the interview schedule and its underpinning rationale. Specifically, the section now clarifies that this process was informed by the lead author's prior scoping review (Nabbijohn et al., 2021), which mapped existing ways of measuring and conceptualizing coping and highlighted key gaps, as well as by their work in proposing integrative model of the coping process (Nabbijohn & McMurtry, 2024), which shaped the conceptual framing of the topic.

Page 8: "A semi-structured interview schedule for the larger project was initially developed by ANN, drawing on their work conducting a prior scoping review of the pediatric chronic pain coping literature (12), which provided a comprehensive understanding of how coping has been conceptualized and key gaps in the literature. Questions were also informed by the integrative model of the coping process (14) and were refined in consultation with coauthors (CCM, LC, and AJ) to ensure clarity and alignment with the study aims. Two of the coauthors (LC and AJ) were not involved in the scoping review or development of the integrative model but have extensive experience with pediatric chronic pain research and qualitative methods, including enhancing methodological rigor and reflexivity. The interview guide was piloted with two adolescents without chronic pain (ages 16 and 18) and edited to ensure that the language and demands of the interview were developmentally appropriate. In addition, the content (e.g., removing or adding questions and probes, improving the clarity and relevance of visuals) and structure of the interview (e.g., scheduling breaks) was further reviewed in consultation with two persons with lived experience to ensure sensitivity and relevance (i.e., an 18-year-old patient partner and a graduate student with both personal experience with chronic pain and expertise conducting interviews with adolescents with chronic pain)."

Comment #24: "Part 1 explored participants' definitions and descriptions of coping AND was

analyzed using reflexive thematic analysis to capture nuanced patterns and meanings in their responses (22)."- Grammar.
Comment #25: "In contrast, qualitative content analysis (23) was used in Part 2 AND sought to summarize participants' feedback on a simplified version of the integrative model, to provide a structured overview of key points."- Grammar.

Response #24 and 25: Thank you for catching these grammatical errors! Both corrections have been made.

Comment #26: It would be good to know why different data analysis methods were used to analyse the different types of data in Line 10-22 on Page 9.

Response #26: We have clarified this rationale in the revised manuscript to make the choice of methods more transparent.

> Page 11: "The primary analyses to address both research questions were qualitative. However, distinct analytic approaches were employed for each. The first research question explored participants' definitions and descriptions of coping and was analyzed using reflexive thematic analysis (reflexive TA) to capture nuanced patterns and meanings in their responses as well as the role of the researcher in these interpretations (27). In contrast, qualitative content analysis (28) was used to address the second research question on adolescents' perceptions of elements of the integrative model, as it enables systematic categorization of explicit feedback and minimizes interpretive influences of the researchers, providing a structured overview of key points."

Comment #27: I find the structure of the paper from Line 22 Page 9 a bit of a surprise as the writing has integrated both parts up until this point and then splits out into two mini papers almost. I am confused why there is a part about interview methods in the methods section and then another Part 1 interview methods in the Part 1 section. It feels very disjointed and as a reader, feels unclear about what is coming next. I think the paper would read better if both part 1 and 2 are integrated throughout, rather than split into two different sections part way through the paper.

Response #27: Thank you for your detailed feedback on the structure and clarity of the manuscript. We have considered how best to address each point and made several revisions to the manuscript described under each point below:

Part 1: Adolescents' Personal Definitions of Coping in the Context of Chronic Pain
* See point above about integrating both Part 1 and 2 together to read more like a traditional style paper with one methods, one results and one discussion section for both parts.

- We acknowledge the concern regarding the split between Part 1 and Part 2. We initially structured the paper in two parts in an attempt to clearly distinguish between the two research aims and methods. However, we agree that integrating Parts 1 and 2 could improve readability. In the revised manuscript, we merged the methods into a single comprehensive section, highlighting distinctions for each part where necessary.

* I think the positionality statements would be better in supplementary material.
* I think the positionality statements are interesting but do not go as far as to say how those positions influenced the data collection or analysis? They highlight that all researchers are interested in paediatric pain but not how that interest and longstanding experience in the field could have influenced interpretations? E.g. how were interpretations of data, if at all, different between those who had lived experience or experience of caring for family/friends with chronic pain compared to those who did not?

- We followed the suggestion to move the positionality statements to the supplementary materials to streamline the manuscript. In addition, we have further elaborated in the section *Assessing Rigor in Reflexive Thematic Analysis* on how the researchers' experiences (e.g., lived experience, clinical or research expertise) may have shaped the processes of data collection, coding, and interpretation. This section now reads as:

  > Page 14: "For instance, team members with personal, relational, and/or clinical experiences often drew on those experiences, leading them to emphasize contextual aspects of coping, while members with extensive research expertise drew more readily on established frameworks. In addition, ANN was aware throughout the process how her familiarity with the coping literature may have sensitized her to information aligned with existing frameworks. This awareness informed reflexive discussions that helped challenge assumptions and deepen, rather than constrain, the analytic interpretation. Supplemental Table 1 provides individual positionality statements to promote transparency and reflexivity in our approach and interpretations."

* It is not clear in RTA for part 1, whether the analysis was inductive or deductive. Sorry if I have missed this detail.

- An inductive approach was previously stated on Page 11, under the "Data Analysis" subsection.

* The themes created are really interesting- no comments suggested on the narrative or quotes.

- We are pleased to hear you see value in the themes and appreciate your positive feedback!

* A big chunk of the mini Part 1 discussion is repeating the findings from the results part. There is only one consideration to broader literature which is the Lazarus and Folkman point. More references to broader literature, rather than repeating findings would be better.

- These small discussion sections were removed by merging Parts 1 and 2 into a single, more traditional manuscript. Relevant information was integrated into the larger discussion section where there is already a greater focus on broader literature and theoretical implications rather than repeating results.

Part 2: Adolescent Feedback on the Integrative Model of the Coping Process

* "Part two aimed to utilize adolescent feedback to assess the appropriateness and refine the integrative model as needed to better reflect the voices of adolescents with chronic pain."- At this point of the paper, I don't think the reader has been shown the integrative model and it would be good to see this here to help the reader also make sense of the results in this part of the paper.

- We appreciate the suggestion around improving the clarity of the integrative model and agree that clarity is important for interpreting the results from the qualitative content analysis. However, the version of the model presented to adolescents reflected an earlier iteration (as noted in the footnote on page 8), consisting of a simplified visual of the three components of the coping process and a verbal description transactional and biopsychosocial framework. A more comprehensive and refined version of the model is available in the Pediatric Pain Letter article by Nabbijohn and McMurtry (https://pediatric-pain-letter.org/262silvia-2/), which we cite throughout the manuscript for interested readers. That said, to avoid potential confusion of what version was shown to participants to provide feedback on, we added the figure from the original article of the integrative model to the supplemental materials (Supplemental Figure 1) with a note directing readers to the original manuscript. In the main text, we offer description of how the model was presented to participants section on the interview schedule (pages 8-9), and we have strengthened the overview of the model in the Introduction (pages 3-4). We also hope that restructuring the manuscript into a single, traditional study helps to make it feel less disjointed.

* "Our approach to ensuring trustworthiness across all three stages of the qualitative content analysis adhered to an established checklist developed by Elo and colleagues (28)."- It would be useful if the authors could add a copy of the completed checklist as a supplementary material and describe more about the content/requirements of the checklist in the text so that the reader understands the significance/context of the different stages mentioned (e.g. preparation phase, organization phase).

- We included a copy of the completed Elo et al. checklist in supplementary material and describe our approach to the three stages (preparation, organization, reporting) in more detail.

* Some of the results/quotes in Table 4 seem to relate very closely to some of the findings of Part 1 of the study. E.g. this quote" "When I first saw the word consequences, like negative is what I thought in my head immediately- […] I don't think of like the consequence of feeling better, I think about like the consequence of like negative things-. Instead of like the positives." (Ivory, cisgender female, age 18)"- sounds very much like the sub-theme "Coping should help but doesn't always". This quote also sounds like some of the findings from part 1 r.e. active vs passing coping strategies- "Sometimes like, personally I would probably do a coping strategy first, and then think about what I've just done." The authors mention there were different interview questions for Part 1 and Part 2 of the study but it would be interesting to see some discussion on the extent to which some similar overlapping findings came out between study parts and some discussion on why that might have been and how it was handled, despite

different questions being asked to participants. Because of this overlap, it makes me unsure why authors did not just utilise findings from Part 1 to modify the integrative model as a team, rather than have another study which repeats many of the findings of Part 1.

- We acknowledge the overlap between some Part 2 quotes and Part 1 themes. We reflect on the overlapping findings when proposing a definition and making refinements to the proposed model in the Discussion section under the subtitle "An Adapted Definition and Model for Coping the Context of Pediatric Chronic Pain".

* Similar feedback point I made for Part 1- Most of the mini Part 2 discussion is repeating the findings from the results part. More references to broader literature, rather than repeating findings would be better.

- As mentioned above, these small discussion sections were removed by merging Parts 1 and 2 into a single, more traditional manuscript. Relevant information was integrated into the larger discussion section where there is already a greater focus on broader literature and theoretical implications rather than repeating results.

General discussion

Comment #28: "An Adapted Definition and Model for Coping IN the Context of Pediatric Chronic Pain"- Grammar.

Response #28: Thank you for catching this grammatical error – we have made this change.

Comment #29: I really like the new definition of coping that the authors have produced from participants lived experiences. I also really like the new model provided which shows the coping process as circular, rather than linear. It would be interesting for authors to see what adolescent perceptions of this new definition are, in a similar way to the way they captured adolescent perspectives on the integrative model. Perhaps this will be a part of their future work as I see brief mention to it in future directions.

Response #29: Thank you for this thoughtful and encouraging feedback! We agree that exploring adolescents' perceptions of the newly proposed definition would be a valuable next step. As noted in the Strengths, Limitations, and Future Directions section, this is an area we intend to examine in future work to further refine and validate the model with adolescent input.

> Page 40: "Future research is needed to continue to test and refine the proposed definitions across more diverse clinical and nonclinical populations of youth with chronic pain."

Comment #30: It would also be nice to see more discussion on how this new model would change psychological interventions/clinical practice. How might a therapeutic session around coping look different because of this new model compared to how it is done now? How would this shape patient experiences or patient outcomes differently?

Response #30: Thank you for this feedback. We agree elaborating on clinical implications would strengthen the manuscript. To this end, we have added the following "Conclusion and Clinical Implications" section:

> Page 39-40: "The results of this study suggest that adolescents' perspectives on coping with chronic pain align with the flexible, process-oriented conceptualization offered by the integrative model. Adolescents perceive coping as always active and personal, but can vary in terms of how intentional and helpful it can feel. Through incorporating adolescent perspectives into the model, this study offers conceptual clarity and language to align the perspectives of adolescents living with chronic pain with other stakeholders' perspectives (e.g., researchers, clinicians, caregivers). Based on these insights, it is critical that research and clinical discussions shift from prescribing "correct" strategies toward collaboratively exploring coping in patient-centered, goal-oriented ways. Specifically, researchers and clinicians may want to avoid relying solely on questionnaires or framing coping responses as either "adaptive" or "maladaptive" without having discussions with youth to capture their personal goals and appraisals as well as information about situational factors impacting their coping. Research implications include improving the validity of measures and our ability to interpret and consolidate research findings. Within clinical contexts, the integrative model may help to provide psychoeducation that increases patients' self-awareness and offers validation of how coping with chronic pain is complex and challenging. Healthcare providers guided by this model may consider a nonjudgmental, open stance focused on understanding the patient's goals and factors shaping their coping preferences and outcomes thereby facilitating individualized coping plans that when practiced may translate into more effortless and sustainable coping habits over time."

Comment #31: I find the figure 3 very small to read (I could not see a lot of the text in C without really zooming in). I think this might be a copyediting thing?

We have revised Figure 3 to try to increase text size; however, we notice that when we copy and paste it into the word document, the text still appears quite small. We have attached the image file separately to this re-submission and would appreciate any support from the Editor regarding how to retain the images original quality.

Comments #32: "Some adaptations they recommended included specifying that coping outcomes vary in terms of intentionally"- Spelling? Do authors mean intentionality?

Response #32: Yes, we did mean intentionality. Thank you for noticing this error and we have made this correction.

Comment #33: "Instead of"- repeated twice on Line 26/27, Page 40.

Response #33: Thank you for catching this. We have made this correction.

Comment #34: Interesting strengths and limitations considered.

Response #34: Thank you for your positive feedback.

Comment #35: I think a paragraph with an overall conclusion to the paper is missing. It would be useful if the authors could add this to bring the main takeaway points of each parts of the study together at the end.

Comment #35: To avoid being too redundant and meeting word count limits, we added some overarching conclusions/takeaways into a merged "Conclusions and Clinical Implications" section, as described in our Response #30 above.

Reviewer #3:

Thank you for the opportunity to review this interesting two-part qualitative manuscript, which aimed to improve the conceptualization of coping as it is experienced by adolescents with chronic pain and to advance theoretical frameworks on pain coping. Strengths of the manuscript include a rigorous approach to thematic analysis involving a large study team and the inclusion of a person with lived experience in the analysis of data.

Areas for potential improvement include clarifying the rationale for the study and the gap it intends to fill, reducing jargon, eliminating qualifying language, and incorporating a richer and more nuanced discussion of the clinical and research implications of this work. Specific comments are included below, which I hope are beneficial to the authors.

Introduction:

Comment #1: In general, a major limitation of the introduction in its present form is that it does not make the current gap in the literature clear enough. For example, although it is concerning that there are major issues with how coping is conceptualized, the authors could make a stronger case for why a conceptual model of coping in the context of chronic pain is needed specifically (and why existing models do not "fit" for adolescents with chronic pain).

Thank you for this feedback. In response to various reviewers' comments, we have revised the Introduction to highlight the unique context of coping with chronic pain compared to other chronic illnesses and how these challenges are influenced by developmental factors. Specifically, we now discuss how adolescents' increasing autonomy and shifting access to caregivers and peers create distinct coping demands that are not fully addressed by existing models. We have also clarified the current gaps in the literature: existing conceptual models are rigid, lack generalizability, and show inconsistency across studies; quantitative methods currently limit insight into the factors driving variability in coping; and there is a notable lack of theory specifically addressing pediatric chronic pain coping. We hope these revisions make a stronger case for the need for a conceptual model tailored to adolescents with chronic pain, highlighting why existing models are insufficient.

> Page 3: "This definition demonstrates that coping is a complex, multifaceted construct. The broader coping literature indicates that coping varies across health conditions (8) over development alongside changes in perceived control and access external supports (e.g., caregivers, peers) (9–11)."

> Page 3: "A recent scoping review of the pediatric (ages 0–21) chronic pain coping literature identified key conceptual gaps (12). First, fewer than 10% of studies cited a theory, and no theories were developed or validated among youth with chronic pain specifically, which is important given that pain in this context is often less predictable and controllable than for chronic illnesses (8). Second, existing models categorize coping responses by type (e.g., distraction, problem-solving) and as "adaptive" vs.

> “maladaptive”, despite evidence suggesting coping varies across individuals and contexts. The predominance of female Western samples (12) further limits generalizability. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of “passive and maladaptive” (13). Lastly, an overreliance on quantitative methods (e.g., questionnaires) for conceptualizing coping limits insights into factors shaping coping.”

Comment #2: The introduction contains many terms that appear like jargon and should be better defined (e.g., "nomothetic models") to enhance clarity.

Response #2: Thank you for this suggestion. In our reworking of the entire Introduction, we have tried to identify and remove any jargon throughout. For example, instead of nomothetic models, we say “Existing models categorize…”. We hope that you find the edits made sufficient in improving the readability of the paper.

Comment #3: Numerous theoretical models are presented in the introduction (e.g., motivational models, transactional model, integrative model) but are not well defined nor differentiated from one another in a meaningful way.

Response #3: Thank you for this helpful comment. We agree that the distinctions between the theoretical models were not as clear as they could be. In response, we have revised the Introduction to improve clarity while keeping the focus on the integrative model as the primary framework for this study. Specifically, we start by introducing the integrative model and how it incorporates frameworks from the general coping literature to link goals, responses, and outcomes within a unified process. We then briefly describe motivational models as focusing on goal-directed processes (e.g., needs for relatedness, competence, and autonomy), and transactional models as emphasizing person–environment interactions (e.g., situational demands and available resources) that shape coping responses and outcomes.

This section now reads:

> Pages 3-4: “An integrative model of the coping process was proposed to apply process-oriented theories of coping with stress from the adult literature to understanding coping with pediatric chronic pain (14). In this model, coping is operationalized as a process involving goals, responses, and outcomes (14,15): goals are one’s intentions for coping and motivate responses; responses are cognitive or behavioral strategies; and outcomes are the consequences of responses, indicating an effective or ineffective coping attempt. Drawing on motivational and transactional theories (16,17), the model emphasizes how coping is influenced by both internal drives for relatedness, competence, and autonomy as well as person–environment interactions, including situational demands (e.g., social context, time pressures) and personal resources (e.g., finances, cognitive capacity); (for more details, see Nabbijohn & McMurtry, 2024). However, the integrative model has not been evaluated for its validity or applied value in adolescent chronic pain.”

Comment #4: The authors note in the introduction that their age range of interest is 10-18 but the Method section appears to specify that the minimum age to be included in the study was 14. Can the authors clarify this?

Response # 4: We thank you for noting this point of confusion and appreciate the opportunity to clarify. The age range of 10–18 referenced in the Introduction was used to reflect epidemiological data on the prevalence of chronic pain across adolescence. The study sample, however, was intentionally restricted to ages 14–19, as outlined in the Methods (page 5), because we wanted focus on mid-to-late adolescents due to research to suggest strong developmental influences on coping as well as to include youth who may be better positioned to reflect on and describe their coping experiences.

> Page 5: "The age range of 14-19 years old was chosen because adolescence is a period of increasing autonomy, shifts in cognitive and emotional regulation, and changes in independence and social support networks, all of which likely shape how people define and engage in coping (19). Selecting participants within the same developmental stage allows for a more coherent understanding of coping during this critical period. Additionally, adolescents were chosen to ensure participants possessed the cognitive and language abilities necessary to reflect on their experiences and engage in discussions around the conceptualization of an abstract construct."

Method/Results

Comment #5: It is unclear how the authors determined that thematic saturation of interview content was achieved. Why is this listed as "not applicable"?

Response #5: According to Virginia Braun and Victoria Clarke (the developers of reflexive thematic analysis), thematic saturation does not align with reflexive thematic analysis approach. They have explicitly written about this here (https://www.tandfonline.com/doi/full/10.1080/2159676X.2019.1704846 in Braun and Clarke, 2019). In brief, Braun and Clarke believe that themes are not finite/exhaustible and that there are no strict stopping criteria, but rather sample size is determined by research aims, analytic depth, and practical considerations. Since our study adopted reflexive thematic analysis for part of the paper, it was not appropriate for us to adopt a methodologically incongruent approach such as theoretical saturation. Additionally, the idea of exhaustible themes does not align with how the authors think about qualitative approaches to data collection and analysis. Our designation of saturation as "not applicable" was intended to reflect this methodological stance.

The target sample size was based on what is typical in extant research and feasibility. To improve clarity, we revised the manuscript to explain this rationale and provide citations more explicitly, as follows:

> Page 12: "As such, concept of data saturation was not applied as a reflexive TA approach suggests themes are generated through interpretive engagement rather than discovered

> (29). A target sample size of at least 20 participants was determined based on guidance from extant literature (30,31) and feasibility, and emphasis was placed on depth, nuance, and richness of the data."

Comment #6: Although the diversity within the sample is certainly a strength, the sample size is still very small and the majority of the participants were White. The authors discuss in the introduction that incorporation of factors related to racial and ethnic diversity is important for understanding coping responses in the context of pain, but unless I am missing it (and please correct me if I'm wrong), I'm not seeing any direct quotes or analysis of data in the RTA that would suggest that these factors were considered in this analysis or informed the newly proposed conceptual model. This could be at least acknowledged as a limitation—perhaps this is an area for future research in the application of this model.

Response #6: We agree that, although our sample included some diversity, the overall sample was predominantly White cis-gender females, which limits the extent to which we can draw conclusions about the role of racial and ethnic factors in coping with pain. We did not state the gender and ethnic identity of participants when providing quotes to limit being overly identifying given the small sample. While the sample size is typical and appropriate for qualitative study, we understand concerns around generalizability; the chosen methodology helps to provide depth in our understanding over breadth. In addition, as we now made clear in the Introduction on Pages 4-5, the second study from this larger project is focused identifying the role of sociocultural identity on coping experiences. Considerations around sample size and limited diversity were already stated as limitations in the manuscript, and a few additional edits have been made to make this more explicit.

> Pages 39-40: "This study is, however, not without limitations. While the study's sample size is appropriate for qualitative research (29–31) and has diverse representation, the insights drawn are representative of a select group of adolescents with chronic pain who were predominantly White, cis-gender females. Adolescents who participated in this research represent those who have access to technology for online participation and who were motivated to share their perspectives. In addition, all adolescents in this sample had received some form of pain focused treatment, with the majority (62%) engaging in psychological interventions. These experiences likely influenced their perceptions of coping, aligning them more closely with clinical perspectives. Future research is needed to continue to test and refine the proposed definitions across more diverse clinical and nonclinical populations of youth with chronic pain. While steps were taken to mitigate confirmation bias, including ongoing consultation with a patient partner and collaborators, future research should continue to explore the relevance and applicability of the model across diverse patient experiences."

Comment #7: Minor… Within the table - I am wondering why "woman" and "man" are used for gender identity when these are not adults.

Response #7: Thank you for noting this. The terms "woman" and "man" were initially used to reflect the upper end of the sample's age range (14–19), which includes individuals in emerging adulthood. However, we agree that this may not fully capture the developmental range of the sample and revised the terminology to “girl/woman” and “boy/man”.

Discussion

Comment #8: In general, the authors frequently appear to use qualifying language throughout the manuscript to justify their use of qualitative methods (e.g., "Qualitative research is particularly well-suited for theory application…") and I don't think it is necessary.

Response #8: Thank you for this helpful observation. We agree that some of the qualifying language could detract from the clarity and confidence of the manuscript. We revised the text to remove or streamline these statements while also ensuring that we have addressed other reviewer feedback.

Comment #9: I think it would be helpful in the discussion to have some more information about the clinical and research implications of this work. Do we need new measures? How do we improve existing interventions based on the information gleaned from this study?

Response #9: Thank you for this feedback. We received similar feedback from the other reviewer and agreed that a discussion around clinical implications would strengthen the manuscript. We have added a “Conclusions and Clinical Implications” section as follows:

> Page 39-40: “The results of this study suggest that adolescents’ perspectives on coping with chronic pain align with the flexible, process-oriented conceptualization offered by the integrative model. Adolescents perceive coping as always active and personal, but can vary in terms of how intentional and helpful it can feel. Through incorporating adolescent perspectives into the model, this study offers conceptual clarity and language to align the perspectives of adolescents living with chronic pain with other stakeholders’ perspectives (e.g., researchers, clinicians, caregivers). Based on these insights, it is critical that research and clinical discussions shift from prescribing “correct” strategies toward collaboratively exploring coping in patient-centered, goal-oriented ways. Specifically, researchers and clinicians may want to avoid relying solely on questionnaires or framing coping responses as either “adaptive” or “maladaptive” without having discussions with youth to capture their personal goals and appraisals as well as information about situational factors impacting their coping. Research implications include improving the validity of measures and our ability to interpret and consolidate research findings. Within clinical contexts, the integrative model may help to provide psychoeducation that increases patients’ self-awareness and offers validation of how coping with chronic pain is complex and challenging. Healthcare providers guided by this model may consider a nonjudgmental, open stance focused on understanding the patient’s goals and factors shaping their coping preferences and outcomes thereby facilitating individualized coping plans that when practiced may translate into more effortless and sustainable coping habits over time.”

‘Dealing with It in a Way That Works for You’: Adolescent Perspectives on Defining Coping in the Context of Pediatric Chronic Pain

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Abstract

Coping is essential in managing pediatric chronic pain, yet current conceptualizations overlook its complexity and lived experiences. We investigated: (1) adolescents' definitions of coping and (2) their perspectives on the integrative model, a previously proposed framework capturing motivational, transactional, and biopsychosocial influences on coping. Twenty-one adolescents ages 14-19 years old with chronic pain from Canada, the United States, and United Kingdom participated in semi-structured interviews concerning their understanding of coping (objective 1) and feedback on the integrative model (objective 2). Recruitment through online platforms, pain clinics, and organizations serving gender and ethnic diverse youth were used. Data were analyzed using reflexive thematic analysis (objective 1) and qualitative content analysis (objective 2). For objective 1, two themes were generated. Theme 1, "dealing with it in a way that works for you", described adolescents' view of coping as an active, personal process involving effort and trial-and-error, occurring with or without conscious awareness. Theme 2, "coping should help but doesn't always" captured how coping is often portrayed as inherently positive, but outcomes can be negative. For objective 2, adolescents identified strengths and improvements for the integrative model related to clarity/accessibility, alignment with lived experiences, and supporting coping plans. For example, while adolescents described the model helpful and easy to understand, they suggested ways to depict the model visually and with greater flexibility to fit different situations. Results led to a new definition of coping and revision of the integrative model to align with adolescent perspectives; advancements for clinical practice are discussed.

Perspective: This article demonstrates that adolescents perceive coping as a personal, active process that various in intentionality and effectiveness. The results provide support for the integrative model and informs a more applied conceptualization of coping to advance research and clinical practices in the context of pediatric chronic pain.

Key Words: Coping, Chronic Pain, Adolescents, Pediatric, Qualitative

Introduction

Chronic pain is prevalent in adolescents (ages 10–18) exacerbating a period of already heightened psychosocial vulnerability [1–3]. A primary aim of psychological interventions for pediatric chronic pain is to promote effective coping [4,5], defined as the 'use of intentional and effortful thoughts or behaviors to manage the internal and external demands of stressful situations or experiences' [6,7]. This definition demonstrates that coping is a complex, multifaceted construct. The broader coping literature indicates that coping varies across health conditions [8] over development alongside changes in perceived control and access external supports (e.g., caregivers, peers) [9–11].

A recent scoping review of the pediatric (ages 0–21) chronic pain coping literature identified key conceptual gaps [12]. First, fewer than 10% of studies cited a theory, and no theories were developed or validated among youth with chronic pain specifically, which is important given that pain in this context is often less predictable and controllable than for chronic illnesses [8]. Second, existing models categorize coping responses by type (e.g., distraction, problem-solving) and as “adaptive” vs. “maladaptive”, despite evidence suggesting coping varies across individuals and contexts. The predominance of female Western samples [12] further limits generalizability. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of “passive and maladaptive” [13]. Lastly, an overreliance on quantitative methods (e.g., questionnaires) for conceptualizing coping limits insights into factors shaping coping.

An integrative model of the coping process was proposed to apply process-oriented theories of coping with stress from the adult literature to understanding coping with pediatric chronic pain [14]. In this model, coping is operationalized as a process involving goals, responses, and outcomes [14,15]: goals are one's intentions for coping and motivate responses; responses are cognitive or behavioral strategies; and outcomes are the consequences of responses, indicating an effective or ineffective coping attempt. Drawing on motivational and transactional theories [16,17], the model emphasizes how coping is influenced by both internal drives for relatedness, competence, and autonomy as well as person–environment interactions, including situational demands (e.g., social context, time pressures) and personal resources (e.g., finances, cognitive capacity); (for more details, see Nabbijohn & McMurtry, 2024). However, the integrative model has not been evaluated for its validity or applied value in adolescent chronic pain.

A recent systematic review of qualitative studies involving young people (ages 12-24) with chronic pain advanced our understanding of adolescent experiences living with chronic pain and provided insight into common coping responses reported in qualitative research [18]. Overall, chronic pain was described as both disruptive and identity-shaping, with young people perceiving their lives as markedly different from their peers; for example, these youth often miss out on opportunities for social and economic growth and depend on caregivers [19]. Coping responses reflected self-directed efforts (e.g., distraction) and external supports (e.g., family/friends), tailored to developmental needs, suggesting that effective support balance fostering autonomy with shared decision-making alongside healthcare providers [18]. However, youth-informed theories linking lived experiences to coping response selection are limited [18], as only one study provided insight into a model grounded in adolescents' lived experiences [20]. This study, focused on adolescents with arthritis, identified how "maintenance" (normalizing pain) and “management” (reducing pain) coping goals shape coping responses, underscoring the importance of adolescents’ motivations in coping. Yet, adolescents’ personal definitions of “coping” in the context of chronic pain remains unexamined, limiting our ability to judge the conceptual alignment among patients, researchers, and healthcare providers. Efforts to incorporate adolescents’ perspectives into theory may help to advance more meaningful and relevant research and clinical practices.

This study is the first of two studies drawn from a larger qualitative interview project examining how adolescents understand and use coping to manage chronic pain. Here, we focused on adolescents’ (1) definitions of coping and (2) perspectives on a proposed conceptualization informed by the integrative model. The second study will explore adolescent perceptions of social identity and situational factors that shape coping and healthcare needs. Together, insight gained into adolescent perspectives on coping can inform more meaningful and effective theoretical representations, clinical discussions, and interventions.

Methods

Participant Recruitment

Adolescents were eligible to participate in this study if they were: between 14-19 years old; living in Canada, the United States of America, the United Kingdom, or Australia; experiencing/experienced chronic pain for longer than three months; and able to understand, converse, and read in English. The age range of 14-19 years old was chosen because adolescence is a period of increasing autonomy, shifts in cognitive and emotional regulation, and changes in independence and social support networks, all of which likely shape how people define and engage in coping [21]. Selecting participants within the same developmental stage allows for a more coherent understanding of coping during this critical period. Additionally, adolescents were chosen to ensure participants possessed the cognitive and language abilities necessary to reflect on their experiences and engage in discussions around the conceptualization of an abstract construct.

Adolescents without access to the internet and a device to participate online and/or with major developmental delays that posed significant barriers to verbal communication were excluded. Adolescents aged 17 years or younger were also required to have a parent or legal guardian's consent to participate in the study. Due to attempts made by individuals to impersonate eligible participants, screening procedures to detect and deter fraudulent participants were used [22], including the requirement to provide a phone number for telephone screening prior to participation, showing a government issued photo ID at the start of the interview, and keeping the camera on during the interview. Participants who were not able to follow these steps were excluded. All eligible participants who completed the study were provided a $25 Amazon gift card.

Participants were recruited through advertisements, snowball sampling, and word of mouth, both online (via social media) and within specialized pediatric pain-management programs (e.g., McMaster Children's Hospital, Stollery Children's Hospital, Comfort Ability Program) and non-profit patient support/advocacy organizations (e.g., Fibromyalgia Association Canada, National Migraine Centre, Versus Arthritis). To ensure diverse perspectives were included [12], advertisements were also shared with special groups on social media (e.g., Facebook) and organizations serving adolescents diverse in gender and ethnic identity. While no formal quotas were applied, the study aimed for at least 25% gender-diverse, cis-gender male, and racial/ethnic minority participants given the known prevalence of these demographics presenting at pain clinics [23,24]. Demographic information collected were monitored by the lead researcher to assess the sample composition and guide targeted outreach, such as asking clinicians sharing recruitment materials to be mindful of particular demographics and following up with recruitment within organizations serving gender and racial/ethnic diverse youth.

Materials

Demographic Questionnaire. A questionnaire was developed to capture self-reported demographic data consisting of age, gender, ethnicity, socioeconomic status (SES), pain characteristics (e.g., pain location, pain onset, pain intensity), and place of residence (i.e., country, province/state). This information was collected and summarized in this study for the purpose of characterizing the sample to provide relevant background context for interpreting participants' experiences. Given that adolescents may not know the details of their caregiver's income or occupation, a subjective measure of SES was used by asking adolescents: "How would you describe your family's access to resources and money?" with response options of 1 = "less than enough"; 2 = "enough", and 3 = "more than enough" [25].

The PROMIS® Pediatric Pain Intensity Measure [26] was administered to characterize pain intensity within the sample. Adolescents were asked to rate their "usual pain" and "worst pain" within the past 7 days and "pain right now" on a 4-point Likert scale ranging from 0 (had no pain) to 4 (very severe). The PROMIS® Pediatric Pain Intensity measure was developed to adapt widely used and studied measures of pain intensity using direct input from adolescents living with chronic pain. Specifically, based on patients' feedback, the inclusion of fewer, clinically meaningful items and response options was deemed as preferable to the traditional numeric rating scale for use in pediatric populations who experience chronic pain [26]. The PROMIS® Pediatric Pain Intensity Measure was found to demonstrate good convergent and discriminant validity in adolescents 8 to 18 years of age [26].

Interview Schedule. A semi-structured interview schedule for the larger project was initially developed by ANN, drawing on her work conducting a prior scoping review of the pediatric chronic pain coping literature [12], which provided a comprehensive understanding of how coping has been conceptualized and key gaps in the literature. Questions were also informed by ANN's familiarity with the broader coping literature used to inform their proposal of the integrative model of the coping process [14]. The interview schedule was developed and revised in consultation with coauthors (CCM, LC, and AJ) to ensure clarity and alignment with the study aims. Two of the coauthors (LC and AJ) were not involved in the scoping review or development of the integrative model but have extensive experience with pediatric chronic pain research and qualitative methods, including enhancing methodological rigor and reflexivity. The interview guide was piloted with two adolescents without chronic pain (ages 16 and 18) and edited to ensure that the language and demands of the interview were developmentally appropriate. In addition, it was further revised in consultation with two persons with lived experience (i.e., an 18-year-old patient partner and a graduate student with both personal experience with chronic pain and expertise conducting interviews with adolescents with chronic pain). The full interview included seven primary questions along with optional probing questions to encourage elaboration from participants as needed. The total interviews took between 50 and 75 minutes to complete. The full interview schedule can be viewed using the following link: https://osf.io/7vnqa/files/osfstorage/68af0f6c40f5d9c1ed161f58.

Of relevance to the current work, questions focused on exploring: (1) adolescents' personal conceptualizations of coping and (2) feedback on a simplified version of the integrative model. More specifically, to gain insight into how adolescents define coping in the context of their chronic pain, participants were asked, "What does coping with chronic pain mean to you?"

Follow-up probes such as “Can you tell me more?” and “What does successful or unsuccessful coping mean to you?” were used as required to encourage participants to elaborate on their initial responses.

Next, adolescents were provided with the following verbal description of a simplified version of the integrative model[1] along with along with a visual representation capturing the process-oriented nature of coping (Figure 1):

“*Coping with chronic pain is sometimes described as a process involving three parts: coping goals, coping strategies, and coping outcomes. Coping goals are the reasons for using a coping strategy, such as to feel less pain or to improve our mood. Our coping goals influence our coping strategies, which are the actions we use to cope with our chronic pain experience. These can be mental strategies such as thinking positive thoughts or behaviors such as talking to someone, taking medications, or exercising. Coping outcomes are the consequences of using a particular coping strategy, such as feeling less pain or feeling more pain. Another example would be feeling less anxious or feeling more anxious. Coping outcomes may be different for different people or situations and can affect how we cope in the future.”*

To elicit feedback on the model, participants were asked: “What are your thoughts about this way of understanding coping?” Optional probes, such as “what parts of this description do(es) or do(es) not make sense to you?” or “what would you change or add?” were used as needed to facilitate elaboration.

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[1] The proposed model reflects a simplified version of the integrative model described by Nabbijohn and McMurtry (2024) as depicted in Figure 1 (see Supplemental Figure 1 for the full model). This version captured the breaking down of coping down into component parts (i.e., goals, responses, outcomes) and understanding the process-oriented relationship between these parts. Variability in coping goals, responses, and outcomes across people, place, and situations was alluded to but specific factors acting on the coping process were not stated to avoid biasing participant responses.

Figure 1. A visual representation of the coping process presented to participants.

Study Procedure

Ethics approval was obtained by the Research Ethics Board (REB) at the University of Guelph (#21-01-009). Prospective participants (age ≥18) or primary caregivers of youth (age <18) contacted ANN via email to sign up for the study, upon which they were invited to participate in a screening interview via telephone. During the phone screening, participants (age ≥18) and/or caregivers of adolescents under age 18 were provided more information about the study purpose and steps, and asked questions to assess the adolescent's eligibility.

After initial positive screening for eligibility, an online meeting (via Zoom) was scheduled with ANN. At this online meeting, eligible participants (and their caregivers if under the age of 18) were first given information about the study and the opportunity to provide verbal assent/consent. Caregivers of any participants under the age of 18 were asked to leave the room following the consent process to provide adolescents privacy in their participation in the study. Adolescents completed the demographic questionnaire via Qualtrics online survey software [27] followed by the interview. Participants were provided a 5-minute break half-way through the interview and at any other point as requested.

Field notes were made by ANN both during and immediately after each interview. Interviews were transcribed verbatim by trained research assistants and fully anonymized. All completed transcriptions were then reviewed by ANN while listening to the audio recording before being uploaded into NVivo 12 (released in March 2020), a qualitative data analyses software package [28]

Data Analyses

To describe the sample's demographic and pain-related characteristics, the Statistical Package for the Social Sciences (SPSS v. 29) was used to compute means, standard deviations, ranges, and/or frequencies, as appropriate, for: age, sex, gender, ethnicity, perceived socioeconomic status (SES), country, pain intensity variables, pain duration, family history of pain, pain locations, and interventions used.

The primary analyses to address both research questions were qualitative. However, distinct analytic approaches were employed for each. The first research question explored participants' definitions and descriptions of coping and was analyzed using reflexive thematic analysis to capture nuanced patterns and meanings in their responses as well as the role of the researcher in these interpretations [29]. In contrast, qualitative content analysis [30] was used to address the second research question on adolescents' perceptions of elements of the integrative model, as it enables systematic categorization of explicit feedback and minimizes interpretive influences of the researchers, providing a structured overview of key points.

Reflexive Thematic Analysis. Reflexive TA [29] was conducted to explore participants' definitions and descriptions of coping. Given that coping is a complex, dynamic construct [12], and that TA broadly emphasizes participants' subjective experiences, TA is useful for exploring the coping process through an individualized lens which considers motivational, transactional, and biopsychosocial influences. Reflexive TA was chosen over other TA approaches due to its emphasis on researcher reflexivity, acknowledging how personal perspectives, study design, and disciplinary context shape data interpretation. As such, concept of data saturation was not applied as an reflexive TA approach suggests themes are generated through interpretive engagement rather than discovered [31]. A target sample size of at least 20 participants was determined based on guidance from extant literature [32,33] and feasibility, and emphasis was placed on depth, nuance, and richness of the data.

To ensure participant voices remained central to the analytic process, the analysis followed an experiential, essentialist approach, focusing on semantic (explicit) features of the data and using an inductive approach to generating codes and themes. The follow six iterative steps of reflexive TA were followed [34]: (1) familiarization with the data through repeated reading of interview transcripts; (2) initial coding of segments relevant to the research question; (3) theme development by clustering codes around shared ideas; (4) developing and reviewing themes to ensure coherence and meaning; (5) refining, defining, and naming themes, including illustrative quotes; and (6) writing up the results.

The author ANN took part in all stages of this analysis. During stages two and three (i.e., generating codes and themes), ANN consulted with CMM to explore alternative ways of viewing the data. At stages four and five (i.e., reviewing, refining, and defining themes), ANN consulted with the full research team, which included three investigators (CMM, LC, AJ) and a patient partner (CM). All authors supported the write up in stage six. In addition, throughout the six-step process, ANN also engaged in reflexive journaling to ensure rigor and reflexivity [35]

Assessing Rigor in Reflexive Thematic Analysis. In alignment with a reflexive TA approach, we acknowledge that our backgrounds, experiences, and values shape the way we engage with this research, from data collection to analysis and interpretation. As clinicians, researchers, and people with lived experience, we recognize that pain is more than a medical issue; it is a complex and multifaceted experience that shapes how people live, connect with others, and feel emotionally. We acknowledge that themes do not "emerge" from the data in an objective manner but are actively constructed through our engagement with participant narratives. Establishing rigor is a critical component of high-quality qualitative research. Multiple strategies were employed to enhance trustworthiness, credibility, and transparency, which were with aligned principles of reflexive TA [29,34,36] and evaluated using a 20-question tool for evaluating TA research quality [37]:

1. Conceptual coherence and methodological alignment: The choice of reflexive TA was justified based on its conceptual fit with the research questions, theoretical underpinnings, and methods of data collection.
2. Credibility and rigor: Ongoing discussions among the research team fostered shared analytical thinking in the refinement of codes and development of themes. The team included researchers and clinicians whose perspective on coping are shaped by their familiarity with the extant literature and clinical experiences working with pediatric pain. ANN and CMM coauthored the original paper on the integrative model. The research team also included individuals with lived experience with chronic pain. These unique perspectives were balanced through regular consultation, ensuring diverse perspectives informed the analysis. In addition, ANN engaged in reflexive journaling and selected a sematic, inductive approach to analysis. Participant quotations were

integrated to ensure that interpretations remained grounded in the data. For each quotation, a pseudonym based on arbitrary theme (i.e., colours) is provided along with the participant's gender identity and age (e.g., Indigo, Cisgender female, age 18).

3. Reflexivity: Reflexivity was treated as a continuous, critical stance rather than a single procedural step. The research team actively acknowledged their subjectivities and considered how their backgrounds, experiences, and values shaped all stages of data collection, analysis, and interpretation. For instance, team members with personal, relational, and/or clinical experiences often drew on those experiences, leading them to emphasize contextual aspects of coping, while members with extensive research expertise drew more readily on established clinical frameworks. In addition, ANN was aware throughout the process how her familiarity with the coping literature may have sensitized her to information aligned with existing frameworks. This awareness informed reflexive discussions that helped challenge assumptions and deepen, rather than constrain, the analytic interpretation. Supplemental Table 1 provides individual positionality statements to promote transparency and reflexivity in our approach and interpretations.
4. Transparency and dependability: Detailed documentation of the data collection and analysis process was maintained, including coding in NVivo, memo-writing, and reflexive journaling. These practices support dependability and confirmability by providing an audit trail of analytic decisions.
5. Impact and resonance: Themes were developed by patterns of shared meaning, rather than simple topic summaries, to ensure applied value and theoretical significance.

Qualitative Content Analysis. To describe adolescents' feedback on the integrative model, Elo and Kyngäs (2008)'s three-phase (preparation, organization, and reporting) qualitative content analysis was used. In contrast with quantitative content analysis, qualitative content analysis ensures that all feedback was captured, regardless of how frequently a particular point was mentioned. In addition, this approach was chosen for its flexibility and ability to systematically summarize direct and descriptive responses. Given that participants were asked specific questions about their feedback, their responses were closely tied to those prompts, requiring minimal interpretation. Accordingly, we adopted a realist epistemological stance, assuming participants' responses provide direct insight into their experiences.

The analysis was conducted by coding explicit, observable elements of the data using a combined deductive and inductive approach. Specifically, participant responses were first organized within a predefined framework (strengths, weaknesses, and suggested changes), and then inductively analyzed to identify meaningful categories that captured key aspects of their feedback. During the preparation phase, ANN familiarized themselves with the data by repeatedly reading the transcripts. In the organization phase, open coding was performed by making notes that guided the development of initial codes. These codes were then reviewed and refined by CMM, with ANN drafting preliminary descriptions for each. During the reporting phase, research team (ANN, CMM AJ, LC, and CM) collaboratively discussed and revised the codes and overarching categories as necessary to ensure accuracy and coherence in the write-up.

***Assessing Rigor in Qualitative Content Analysis*.** Our approach to ensuring trustworthiness across all three stages of the qualitative content analysis adhered to an established checklist developed by Elo and colleagues [38]. In the preparation phase, interview questions were developed with input from the research team and a patient partner and piloted with adolescents to ensure clarity and relevance. A semi-structured interview format with primary and probing questions was adopted to allow inductive responses while minimizing interviewer influence. ANN also engaged in reflexive journaling to maintain awareness of her role in shaping interactions. To strengthen dependability, adolescents were purposively sampled across gender, ethnic, and socioeconomic contexts to capture diverse perspectives.

In the organization phase, transparency was maintained by documenting the development and refinement of categories. Congruent with good practice, a single coder approach was used, yet familiarization, open coding with audit trails, and collaborative discussions among the patient partner and research team with discrepancies resolved by consensus were used to ensure categories accurately reflected the data, enhancing credibility and confirmability.

In the reporting phase, findings were presented systematically, first within the framework of strengths, weaknesses, and suggested changes, and then refined into categories. Connections between data and interpretations were demonstrated in a table with representative quotations, ensuring participants' voices were evident. Categories were distinct and comprehensive, capturing all participant ideas regardless of frequency. Overall, results are conveyed with clarity, scientific rigor, and a full account of the analytic process to support trustworthiness.

Results

Participants

In total, data were collected from 21 participants between ages 14 to 19 years old (*M* = 17.83, *SD* = 1.62). All participants who consented to participate completed the study in full. Table 1 provides a summary of participant demographic and pain characteristics.

Demographic Variables		**Pain Variables**	
Sex, *n* (%)		**Years living with pain,** M years (SD), range	6.47 (4.14), 1.40-16.31
Female	17 (81.0)		
Male	4 (19.0)		
Gender, *n* (%)		**Pain intensity**, M (SD)	
Girl/Woman	13 (61.9)	Current	1.24 (.77)
Boy/Man	3 (14.3)	Average	1.62 (.87)
Agender	2 (9.5)	Worst	2.48 (.93)
Nonbinary	1 (4.8)		
Gender Fluid	1 (4.8)		
Prefer not to answer	1 (4.8)		
Ethnic identity, *n* (%)		**Pain location**, *n* (%)	
White	14 (66.7)	Head	9 (42.9)
Arab	4 (19.0)	Neck	3 (14.3)
South Asian	2 (9.5)	Back	2 (9.5)
Black/Caribbean	2 (9.5)	Hip	3 (14.3)
Chinese	1 (4.8)	Abdomen	4 (19.0)
Jewish	1 (4.8)	Widespread joint pain	4 (19.0)
		Musculoskeletal pain	4 (19.0)
		Multiple locations	10 (47.6)
Perceived SES, *n* (%)		**Interventions,** *n* (%)	
Less than Enough	3 (14.3)	Medication	16 (76.2)
Enough	9 (42.9)	Physical	16 (76.2)
More than Enough	7 (33.3)	Occupational	6 (28.6)
Prefer not to answer	2 (9.5)	Psychological	13 (61.9)
		CBT	10 (47.6)
		ACT	3 (14.3)
		DBT	1 (4.8)
		CAP	1 (4.8)
		Peer support	2 (9.5)
Country, *n* (%)		**Family history of pain,** *n* (%)	14 (66.7)
Canada	19 (90.5)		
United States	1 (4.8)		
England	1 (4.8)		

CBT = Cognitive behavioural therapy; ACT = Acceptance and commitment therapy; DBT = Dialectical behavioural therapy; CAP = Comfort Ability Program

Table 1. Self-reported demographics and pain characteristics of participants in Parts 1 and 2 (*N* = 21).

Adolescents' Personal Definitions of Coping in the Context of Chronic Pain

Findings from the reflexive TA explore how adolescents conceptualize coping with chronic pain. When asked to reflect on the meaning of 'coping' in the context of their chronic pain, adolescents exhibited some difficulty articulating this concept. Instead, they often described a process or experience, essentially defining the term through personal examples, highlighting the complex and multifaceted nature of coping.

Two overarching themes were generated from adolescents' responses. The first theme, *Dealing with "It" in a Way That Works for You,* captures adolescents' descriptions of coping as individualized, directed effort to accept or control aspects of the chronic pain experience—whether that is the pain itself, their ability to function despite pain, or both simultaneously. The second theme, *Coping Should Help, But Doesn't Always*, reflects adolescents' views that coping is meant to be helpful, but outcomes can vary. Together, these themes provide insight into how adolescents conceptualize and make sense of coping in their daily lives.

Theme 1: Dealing with "It" in a Way That Works for You. To organize the data related to this theme, we identified two subthemes that illustrate the characteristics adolescents consider important when conceptualizing coping: *Active but Not Always Intentional* and *Personalization.*

Sub-theme: Active but Not Always Intentional. Adolescents unanimously described coping as an effort to *deal* with a specific stressor, which may entail accepting, managing, or attempting to control some aspect of the pain experience, without necessarily solving or eliminating the problem. One participant articulated this distinction by comparing treatment with coping as follows:

> *"A treatment is really aimed at resolving the problem, whether it be pain or the actual cause of the pain, and then coping is managing it without necessarily resolving it, it's floating, keeping afloat…You're not getting out of the water, yet at least but you're treading water." (Indigo, cisgender female, age 18)*

Using phrases like "dealing with it" or "managing it" are suggestive of coping being an active process because it implies an ongoing effort to engage with an identified problem to manage its impact. Other phrases commonly used that emphasize coping as having an active component included *"learning to manage"* and *"identifying things that have (not) worked"* – these suggest a continual, self-guided effort to evaluate and learn. Additionally, adolescents also emphasized the importance of putting forth effort to feel like they are coping. As such, while many participants reported using medication to cope with pain, some participants held a conflicting view about whether using medication truly constituted coping, since it does not require the same level of effort and learning and, therefore, felt that it was *"cheating" (Ivory, cisgender female, age 18)*. A sense of control over the stressor was seen as important, whether that be pain or something else. For example, one participant indicated that coping with chronic pain means dealing with the challenges that come up in their life related to the pain because that's where they can have more control and a clearer understanding of the situation. This participant also echoed coping as putting forth effort, such as "trying" or "pushing" through daily activities:

> *"I feel like coping to me means to have something under control. To be able to cope, it means you – you've understood really the situation, and you know how to manage it, and what to do in that situation, rather than being in the unknown […] Um, I think the definition of coping is really just always try – like when you're going through a pain, it*

> *becomes really easy to just feel like you have no power against like a bigger thing […] but everyone experiences a form of coping throughout their day... even just like getting out of bed in the morning… you are coping by pushing through, trying, and keep going" (Teal, cisgender man, age 17)*

However, it is important to note that while adolescents described coping as "active", they did not see it as always being an "intentional" process. Instead, coping was often described as ranging from automatic, instinctual behaviors to deliberate, effortful strategies, with the degree of intentionality being shaped by factors such as how effortful a coping response is to implement, the amount of experience one has coping with pain, and pain or symptom intensity. An example of a participant discussing the role of effort in determining intentionality is as follows:

> *"I think there's definitely automatic coping, and I think we do it in so many ways in our like daily lives that we don't even realize it…The purposeful ones are definitely like harder to put in place and continue doing, so even if it helps me, it is sometimes hard to regularly do it, for example, stretching and physiotherapy." (Violet, cisgender female, age 15)*

The continuing thread of effort reflected in adolescents' responses was not only seen as interacting with intentionality but also acknowledged to change with time. More specifically, many adolescents reflected on how coping responses initially require intentionality because they are unfamiliar, but then often become automatic with repetition and time. For example:

> *"When I first started it, I had to put in a lot of mental effort to do these things, to make these choices…Now it's just something that I do because I enjoy doing it. Not something I have to think about or put a lot of thought into, which I find is, is a lot more helpful." (Amber, cisgender female, age 18)*

Although coping may become more automatic and habitual with time, there are other factors that can drive automaticity such as symptom severity. Some adolescents noted that when pain or symptoms are intense, coping is more automatic because there is no time to think of goals or plan. However, when automatic or habitual coping responses are not enough to manage pain or its impact in a situation, adolescents may be more intentional about recruiting other more effortful or novel coping responses. For example:

> *I think definitely when you're in really bad pain and you know something helps you don't think about like 'oh I need to cope with this pain' it's more like 'I'm just going to go get this.' It's not like a goal to cope with it…unless it doesn't really work and I need to do more" (Magenta, cisgender female, age 14).*

Despite the varying degrees of intentionality, most participants recognized that coping tends to be goal-directed, even if they were not consciously aware of those goals in the moment. As such, even when adolescents report unconsciously framing their actions by their coping goals in the moment, they recognized in hindsight that many of their behaviours serve a desired function such as reducing pain, conserving energy, or maintaining functioning:

> *"Even like the instincts, they're automatic but they're built in a way where there is always a goal to help you either survive or react appropriately… Just because you act instantaneously doesn't mean you don't have a goal, it just might not be a goal that you chose, but automatically went with." (Fuchsia, cisgender female, age 18)*

Sub-theme: Personalization. A second important element in the quotation *"dealing with it in a way that works for you"* is the emphasis on personalization and flexibility. Firstly, the meaning of "it" – that is, the stressor perceived to be the focus of coping – varies across people and the situations. For many, "it" referred to the pain itself, with coping framed as an ongoing process of managing that experience. This includes strategies to endure pain during difficult moments, reduce its intensity in the moment, prevent it from getting worse in the future, as well as accept its persistent presence:

> *"I think [coping] accepting and learning to manage living with pain…For me, coping is for me how I deal with it [the pain], so when I'm talking about successful coping strategies, for me, it's normally things that have worked for me to help reduce my pain or help me deal with my pain in a more tolerable way." (Sepia, gender fluid, age 18)*

The quotation above also further highlights the personal nature of coping, as reflected in the participant's repeated use of the phrase *"for me",* indicating an awareness that one's coping preferences may vary from others. Outside of pain, another target of coping identified by adolescents was functioning. Many adolescents explicitly stated that any action supporting daily life could be considered coping, *"even if it doesn't necessarily help you with the pain" (Fuchsia, cisgender female, age 19)*. For example, coping was conceptualized as finding what helps one function and keep up with daily routines instead of fixating on or being drained by their pain:

> *"For me, it's just making it to like the end of the day or the end of the week or whatever. Like, giving myself an enough like strength, then enough energy to like, make it to wherever I've got to be." (Saffron, nonbinary, age 18).*

Beyond daily survival, many adolescents suggest coping functions to help them to engage in life at the level that is seen as "normal" or that meet one's expectations for themselves in psychosocial, physical, academic, and financial domains of life:

> *"My goal with coping is just to be able to like participate in my life in the capacity that I want to, because, the pain, it gets in the way of that a lot." (Periwinkle, nonbinary, age 18)*

Often though, adolescents were not able to make a clear distinction between the focus of coping being either pain or functioning, which emphasized the need to deal with both simultaneously, with efforts towards one likely influencing the other. On one hand, using coping responses to manage pain can promote one's ability to engage in various aspects of life, such as academics, social activities, or self-care routines. For example, one participant emphasized that effective coping is when pain feels more tolerable and, therefore, their functioning improves:

> *"Regulating myself and keeping myself like a stable spot... where I guess I'm not experiencing like severe levels of pain every single day and I can actually function like, go to school, walk, and my mental health is good too." (Lilac, cisgender female, age 18)*

On the other hand, many participants indicated that improving their psychosocial well-being, such as lowering stress and engaging in social activities, help with managing their pain intensity. For instance:

> *"I find that when I isolate myself... my mood goes down and then I don't have the energy to help to take care of myself, then my pain gets worse. So, it's like, it's all cogs in a machine. If I take care of me – like my mental health and like my emotions – I know I'll have the energy to take care of my body" (Turquoise, cisgender female, age 18)*

Taken together, these results highlight nuance in how adolescents conceptualized coping: though coping is often personal and requires active engagement, it does not always arise from deliberate decision-making. Meanwhile, adolescents view coping goals as relevant in their coping process, but these goals are often operating implicitly, and are only reflected on or recognized in hindsight. Importantly, the focus of coping with chronic pain for adolescents is not pain alone – it also includes managing one's functioning, which is often intertwined with managing their pain experience. Adolescents unanimously agree that coping does not often resolve the pain, but rather, results in a range of possible coping outcomes, which led to the generation of the second theme.

Theme 2: Coping Should Help But Doesn't Always. Participant definitions suggest that coping with chronic pain is about the ongoing effort to manage pain and/or maintain functioning, even if the outcomes are not positive. This idea was captured by the quotation: *"if we're coping, it should be helping, even though it doesn't all the time" (Blue, cisgender female, age 17)*. For many adolescents, their appraisals of the effectiveness of a coping strategy depends on its alignment of its coping outcomes with their conscious or unconscious coping goals. As such, rather than viewing coping as inherently good or bad, participants described a more nuanced understanding, recognizing that the same strategy could have both helpful and harmful effects depending on one's priorities and the situation. The following quotation demonstrates the complexity of evaluating the same coping strategy (i.e., stoicism) considering personal goals and situational factors:

> *"I think each one [strategy] has its strengths and weaknesses… For example, sometimes being stoic, it's kind of not helpful if, like, if you go to a doctor or like even on the bus. If I act like I'm not in pain, people are not gonna give me a seat in the bus. But if I do act like I'm in pain, or I'm wearing my braces so there's like visible signs that it's painful for me to do things, then it's a lot easier to get a seat. I think at a doctor's office, it's bad if you're too stoic, because they just won't really believe what you're saying. But, then…if you talk to your teachers, or to your peers, like you don't want people to think, that you're less capable of doing certain things… so it's always a balance." (Fuchsia, cisgender female, age 19)*

Another important consideration was the distinction between short- and long-term outcomes. Adolescents recognized that some coping strategies, like physiotherapy, may not provide immediate relief but could yield benefits over time. This awareness shaped how they defined successful coping as balancing feeling better in the moment and making choices that supported long-term well-being, even if those choices required short-term sacrifices:

"It's probably going to be a combination of positive and negative outcomes. I guess just like weighing it, like you know in terms of oh it's positive that I completed this task, but you know negative I'm more tired, and then I would usually, like…know which one's more important that I complete." (Chartreuse, cisgender female, age 19)

Adolescents identified a range of coping outcomes that can be drawn on as markers of successful and unsuccessful coping in the short- and long-term. These markers were often described in opposing terms (e.g., healthy vs. unhealthy), and informed decision-making about whether to continue, adapt, or abandon a coping response. As shown in Figure 2, markers were positioned along a spectrum from positive to negative effects and included: (1) pain or symptom changes, (2) changes in functioning, (3) health implications, (4) attention given to pain, (5) variety in coping, and (6) effort and motivation. These markers are also described and demonstrated with example quotes in Table 2. Importantly, participants varied in how they used these markers; some prioritized one or two markers as the main indicators of coping success, while others combined multiple markers when evaluating their coping. The number of different markers and variability their prioritization emphasize the complexity of the coping process.

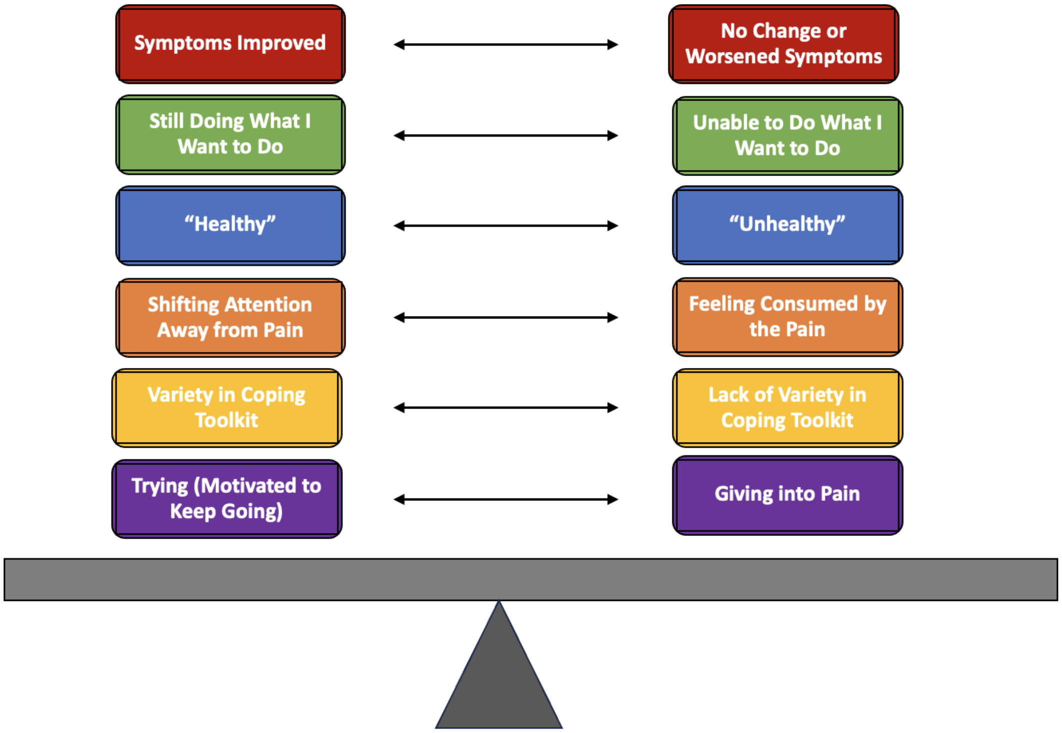

Figure 2. Under the theme "Coping Should Help But Doesn't Always" (Part 1), adolescents identified markers of successful vs. unsuccessful coping, as summarized in Table 3. Participants described coping outcomes in opposing terms, such as healthy vs. unhealthy. Variability in coping outcomes with respect to each marker was characterized in relation to coping goals and consideration of short- and long-term consequences.

Markers	Description	Sample Quotes
1. Symptoms Improved vs. No Change or Worsening	A reduction in pain was identified as a marker of successful coping whereas worsening or no changes in pain was identified as a marker of unsuccessful coping.	*"Well, it (unsuccessful coping) is being in like more pain" (Saffron, nonbinary, age 18)*
2. Able vs. Unable to Do What I Want To Do	Successful coping was defined as the ability to continue working toward their goals and engaging in daily life, even in the presence of pain. Many adolescents rely on strategies that allow them to function at a level that felt normal for them.	*"I think successful coping is to well in essence be able to function at a somewhat normal level with my pain. Like realistically, it's not always the case but I think successful coping would be having strategies in place that I can rely on to [get] me at a normal functioning level for whatever I'm doing." (Ivory, cisgender female, age 18)*
3. Healthy vs. Unhealthy	Successful coping should be "healthy", meaning that coping responses are safe and sustainable. Many participants note that while some coping responses that feel helpful in the moment by, for example, allowing you to engage in activities you enjoy, if they cause long-term damage or suffering in mental, physical, and social domains, coping may still be regarded as unsuccessful. Some common markers of unhealthy coping efforts would be: neglecting self-care; burnout or exhaustion; avoidance; behaviours that damage to the body like overusing a body part, unhealthy diets, substance use, or self-harm; and causing stress to loved ones or damage to personal relationships.	*"Um, so like I struggled with like to self-harm as a coping strategy and like um, s-substance use. Um, and like the things that like made me feel bit better but weren't, like, just safe or healthy." (Saffron, nonbinary, age 18)* *"Anything that kind of avoids the major issue, and kind of like provides short-term benefits, like can be emotional coping of like stress eating for example or just over-eating that could be you know short-term coping where it makes you feel good in the moment but at the end of the day your underlining issues is always gonna come back to you. So, I think unsuccessful coping looks like that. For example, like how I was coping with my chronic pain by pushing myself too hard was unsuccessful because it didn't deal with it, and in fact made it worse. It made me feel good that I could stand sports, and I could continue doing the things that I love, but wouldn't last as long as I'd like it to because I ignored the chronic pain." (Mauve, cisgender male, age 19).*
4. Shifting Attention From vs. Toward Pain	Adolescents indicated that being able to shift their focus to things other than the pain is successful as it helps with relaxation and participation in other valued activities.	*"I can tell when it (is helpful) um, like it (the pain) is not the only thing that I can focus on. Because, usually, when it's bad, it's like the one thing that my brain's like really focusing on, it's just kinda the pain's like, there and I can't really focus on other things, so I know, that it helped when um, when I'm like I'm able to do other things and there's no really anything in the way, and then like my pain isn't in the way for me doing things in my life." (Pewter, agender, age 14)*
5. Variety vs. Lack Thereof	Another key aspect of successful coping was having a diverse toolkit of strategies and knowing when to use them. Practical, easy-to-implement strategies help manage pain, while learned techniques can become intuitive over time. A lack of variety in coping methods can leave individuals feeling stuck and unsupported when their limited strategies do not work for them.	*"I'd say you have a lot of different, like tools in your tool-kit…like in a pain toolkit, that kind of distracts you from the pain" versus "There is not a lot of different like tools that you can use, maybe you only have one and maybe it's not that helpful for you." (Magenta, cisgender female, age 14)*
6. Trying vs. Giving In	Adolescents emphasized the importance of motivation and effort in coping, viewing persistence as key to achieving personal goals despite chronic pain. Successful coping required consistency and active engagement, while giving up signaled withdrawal and a lack of effort, allowing pain to take over.	*"I think I would still consider it (coping) successful if I'm like trying. Um it's mainly just trying and wanting it, like if I didn't want it and I didn't care and I wasn't trying then I would have – I would never get to that success point, or like stability point, so I would still consider like me trying as successful." (Lilac, cisgender female, age 18)*

Table 2. From Part 1 (Theme: Coping Should Help But Doesn't Always): Descriptions and example quotations from participants to illustrate the markers of successful vs. unsuccessful coping as identified by adolescents when discussing their definitions of coping.

Adolescent Feedback on the Proposed Model

The results of adolescents' feedback on the proposed framework for conceptualizing coping were summarized and reported using qualitative content analysis. The demographics of participants for Part 2 were identical to those of Part 1. A description of categories, codes, and corresponding quotations are presented in Table 3. In general, all adolescents indicated that the presented integrative definition "makes sense" and provided examples applying components of this definition to their own lives. Their specific feedback on the strengths, weaknesses, and opportunities for improving the framework were organized into three overarching categories: (1) Clarity and Accessibility, (2) Alignment with Lived Experience and Existing Knowledge, and (3) Promoting Intentionality.

Category	Codes	Sample Quotations
Clarity and Accessibility	*Strengths*	1. “I like that. I think it’s good. Um, it kind of just really sets the image of like—and makes it easier to understand.” (Lilac, cisgender female, age 18)
		2. “I think it’s logical, and it’s, reasonable to help, create a process, that can be followed and monitored.” (Periwinkle, non-binary, age 19)
		3. “If you’re just starting your journey with dealing with chronic pain, you need to be able to understand these three [coping goals, coping strategies, coping outcomes], and be able to learn to start incorporating them.” (Marigold, cisgender female, age 17)
		4. “I would say it’s a really good way to try and think about it, and I think the simplicity of it is very helpful to like, try and establish this system. If you’re explaining coping to someone who’s new to chronic pain or trying to deal with their chronic pain, then I think this would be a really good system to instill.” (Amber, cisgender female, age 18)
	Weakness/Suggested Improvements	5. “When I first saw the word consequences, like negative is what I thought in my head immediately- […] I don’t think of like the consequence of feeling better, I think about like the consequence of like negative things-. Instead of like the positives.” (Ivory, cisgender female, age 18)
		6. “I might use pictures and colours. And I might define coping in it. It feels really broken up, like I get that’s it’s supposed to define coping, but it’s really broken up, maybe put it in a circle.” (Indigo, cisgender female, age 18)
Alignment with Lived Experience and Existing Knowledge	*Strengths*	7. “I feel like any detail I can think of is able to kind of fit into one of these- into kinda like this timeline so it does make sense to me.” (Fuchsia, cisgender female, age 19)
		8. “I mean it makes sense…It’s kind of like um, the like CBT method of the thinking right, like the thought affects the feeling affects the action.” (Saffron, agender, age 18)
	Weakness/Suggested Improvements	9. “This is a good way to think about it in abstract, but I don’t think, that when you’re actually dealing with it, this is what you’re thinking about […] I think… that, a lot of people already get this about coping almost intrinsically… cuz, it is something that you just kind of do.” (Sepia, gender fluid, age 18)
		10. “Sometimes like, personally I would probably do a coping strategy first, and then think about what I’ve just done.” (Teal, cisgender male, age 19)
		11. “There are different aspects of my pain and my health in general […] I found that, before I could go onto the coping strategies that help my pain, I had to start with the coping strategies that helped with the trauma.” (Coral, cisgender female, age 15)
		12. I think it’s too hard to put everything in your life as a goal, or a strategy, right, like I think- and like even like coping outcomes sometimes things just happen…I wouldn’t wanna frame like an allergic reaction to a pain drug as a coping outcome […] Also, like it- it’s-like, it’s not necessarily from like a patient perspective I think it’s more from a clinical perspective. […] Well, it makes sense it’s just like not in my own words or necessarily the words of like, other people I’ve talked to with chronic pain, it’s very like clinical” (Indigo, Cisgender Female, age 18)
Promoting Intentionality	*Strengths*	13. “Like if you have like a bad outcome, it’s sorta gives you knowledge that, “ok maybe this direction isn’t great, it’s not super helpful, and it doesn’t make me feel good.” You also know that you tried it and it’s okay that it didn’t work…if it’s good, then you might stick with it, and then see results over a longer period of time.” (Indigo, cisgender female, age 18)
		14. “I probably would be able to deal with it…when I do it in like a goal sort of way like- like am I gonna ignore the pain, am I tryna alleviate it…its like probably a better way to approach it.” (Chartreuse, cisgender female, age 19)
	Weakness/Suggested Improvements	15. “I feel like if I were to really put a lot of thought and a lot of effort into, you know, ‘this is the goal of why I’m doing this strategy and this is the outcome that I want, this is the outcome that I’m having?’ would probably have more of a negative impact on me now, because, I feel like I would just enjoy doing it less.” (Amber, cisgender female, age 18)

Table 3. From Part 2: Selected quotations to illustrate adolescent feedback on the proposed integrative model of coping, highlighting its strengths, weakness, and areas for improvement based on their experiences living with chronic pain.

***Category 1: Clarity and Accessibility*.** Most adolescents described the model's definition of the coping process as brief, straightforward, and easy-to-understand (Table 3, Quotation 1). They highlighted that the model provided a clear and structured way to conceptualize coping, which is helpful for applying and monitoring coping strategies effectively (Table 3, Quotes 2-4). Participants noted that simplicity and structure of the model is beneficial for those in the early stages of learning to cope with chronic pain (Table 3, Quotation 4).

Despite the model's strengths, adolescents identified areas for improving clarity and accessibility. The most common concern was the term "consequences," which they felt had a predominantly negative connotation (Table 3, Quotation 5). They suggested that clarifying that coping strategies could lead to both positive and negative effects would create a more balanced perspective. It was also recommended that incorporating visual elements would enhance accessibility, with a specific suggestion to use a circular representation rather than a linear one to better reflect the ongoing nature of coping (Table 3, Quotation 6). In addition, while specific elements of the coping process were defined, participants noted that the model did not explicitly define "coping" itself, which they believed would improve overall clarity and comprehension.

Category 2: Alignment with Lived Experience and Existing Knowledge. Another reason adolescents provided for why this model "makes sense" was because they could make connections with either their own personal experiences (Table 3, Quotation 7) or other psychological theories that they are already familiar with, such as the cognitive-behavioral therapy model (Table 3, Quotation 8). However, many adolescents identified certain aspects of coping that they felt could be better captured by the integrative model. The most common suggestion was to adjust the definition to account for the automatic nature of coping. One adolescent elaborated on this by describing coping as being located "intrinsically," suggesting that while the model is appropriate, it should acknowledge that coping is not always intentional (Table 3, Quotation 9). Correspondingly, another recommendation was to allow coping to start at different points in the process, such as beginning with coping strategies rather than always starting with a predefined goal (Table 3, Quotation 10).

Lastly, while the simplicity of the model was seen as beneficial for understanding coping, many adolescents felt that it failed to capture the true complexity of the process (Table 3, Quotation 11). Some participants highlighted that coping with chronic pain often involves managing other stressors simultaneously, meaning that coping is influenced by multiple interacting factors. Another suggestion was to reconsider how experiences are categorized within the model. For example, one adolescent expressed concern that an allergic reaction to a medication should not be considered a coping outcome but rather a factor that limits the effectiveness of that medication. Additionally, one adolescent criticized the model for using "clinical" language (e.g., "consequences", "mental and physical actions") to describe coping instead of the words used by people with chronic pain (Table 3, Quotation 12). Making the model more flexible and incorporating more patient-centered language were suggested to improve its application.

Category 3: Promoting Intentionality. Many adolescents found the model helpful in bringing awareness to possible goals, such as reducing pain or improving mental health, and how to select coping strategies and evaluate coping outcomes accordingly. Several participants highlighted the importance of trial and error in this process, noting that experimenting with different strategies allowed them to determine what worked best for them. They emphasized that both positive and negative experiences served as valuable learning opportunities, ultimately refining their coping process, and creating a sense of direction over time (Table 33, Quotes 13 and 14). As such, a model conceptualizing the coping process serves to promote individualized coping plans. One participant noted a drawback to increased intentionality, explaining that over-analyzing coping strategies can make the process feel rigid and unenjoyable (Table 3, Quotation 15). While setting goals early in chronic pain management helps identify effective strategies, relying on goal-oriented coping long-term may become too effortful, potentially reducing motivation and well-being. This suggests that a flexible approach, balancing goal setting with intrinsic enjoyment, may be key to sustaining effective coping strategies.

Discussion

This study aimed to understand how adolescents define coping in the context of chronic pain and their opinions of a proposed framework (i.e., the integrative model) to advance patient-centered research and clinical practice. Results indicate adolescents view coping as critical in their pain journey and they see merit in the integrative model for understanding their experiences. Their personal definitions emphasize active and personal processes in coping. They suggest coping is not about eliminating pain but about finding ways to navigate life with pain while understanding that these efforts may not always succeed.

The *active* nature of coping refers to an effortful, goal-directed process involving ongoing evaluation, learning, and adaptation, aligned with previous research [18]. Coping responses typically conceptualized as “passive”, such as sleep or prayer, were reported being used in goal-directed ways to manage pain or support functioning. However, contrary to predominant theories within the pediatric chronic pain literature such as the control-based model of coping [6], adolescents did not equate coping being “active” with it being “intentional”. Instead, participating adolescents unanimously acknowledged that using coping responses can be intentional (e.g., choosing to take a nap to reduce pain or recharge energy to complete a task), but often happens without conscious awareness of their goals in the moment (e.g., taking a nap because of pain and only later noticing reduced pain and improved energy levels). Often, coping goals operate implicitly on behaviour and are recognized by adolescents in hindsight. However, adolescents noted that the effectiveness of coping responses depends on the alignment between goals and outcomes, suggesting that helping them become more aware of these relationships may support more strategic coping.

The *personal* nature of coping reflects individual and situational variability. Adolescents noted differences in their coping goals (i.e., pain vs. functioning), access to and preference for coping responses, and coping outcomes across time and situations. Adolescents recognized that many coping responses hold some combination of positive and negative effects in the short- and long-term. Pioneers Lazarus and Folkman (1984), introduced the dynamic nature of coping and emphasized the influence of individual (e.g., personality) and situational (e.g., setting, task demands) factors on coping responses and outcomes; however, discussions of coping within the pediatric chronic pain literature have typically failed to be consistent in this nuance [12]. The integrative model may offer a promising way forward by emphasizing flexibility and individual context, warranting its evaluation and refinement using the perspectives of adolescents with chronic pain.

The results from the qualitative content analysis provide insights into the utility of the integrative model, with adolescents responding positively to its breakdown of coping into component parts (goals, responses, outcomes) and depiction of coping as a process. They found this structure easy to understand and relatable. Importantly, adolescents recognized that the framework emphasized intentional coping, which they believed could support the development of strategies tailored to individual preferences and situational needs. Through trial and error, adolescents described learning to cope with their pain, suggesting that a process-oriented model may help advance interventions by supporting awareness of coping goals and encouraging reflection on past outcomes as learning opportunities to refine coping strategies. Adolescents' constructive feedback highlighted the importance of explaining the model using accessible language and visual representations. They also noted that, although the structured approach to coping was valuable, they are unlikely to engage in such deliberate processing during moments of high pain or stress. Instinctive or unconscious coping is more common, realistic, and often preferred by adolescents due to its efficiency and reduced effort, as well as its association with feelings of productivity or enjoyment.

An Adapted Definition and Model for Coping in the Context of Pediatric Chronic Pain

Based on adolescent definitions and feedback on the proposed integrative model of the coping process, we propose the following definitions of coping and corresponding visual representation depicted in Figures 3 and 4:

> *Coping in the context of chronic pain is an active and personal process that involves consciously or unconsciously using thoughts or behaviors to deal with the physical sensations and/or everyday challenges that come with having chronic pain. Coping is not about curing or eliminating chronic pain; rather, it is intended but not guaranteed to help you get through the day and possibly even thrive despite having pain. Coping looks different for every person and situation but always involves having one or more coping goals (whether aware of it in the moment or not), using one or more coping responses (thoughts or behaviors), and experiencing one or more coping outcomes (e.g., changes in pain, emotional experience, and/or functioning). Coping outcomes can make one feel*

better, worse, or somewhere in between, depending on how well they fit with their coping goal(s) and support their well-being in the short- and long-term.

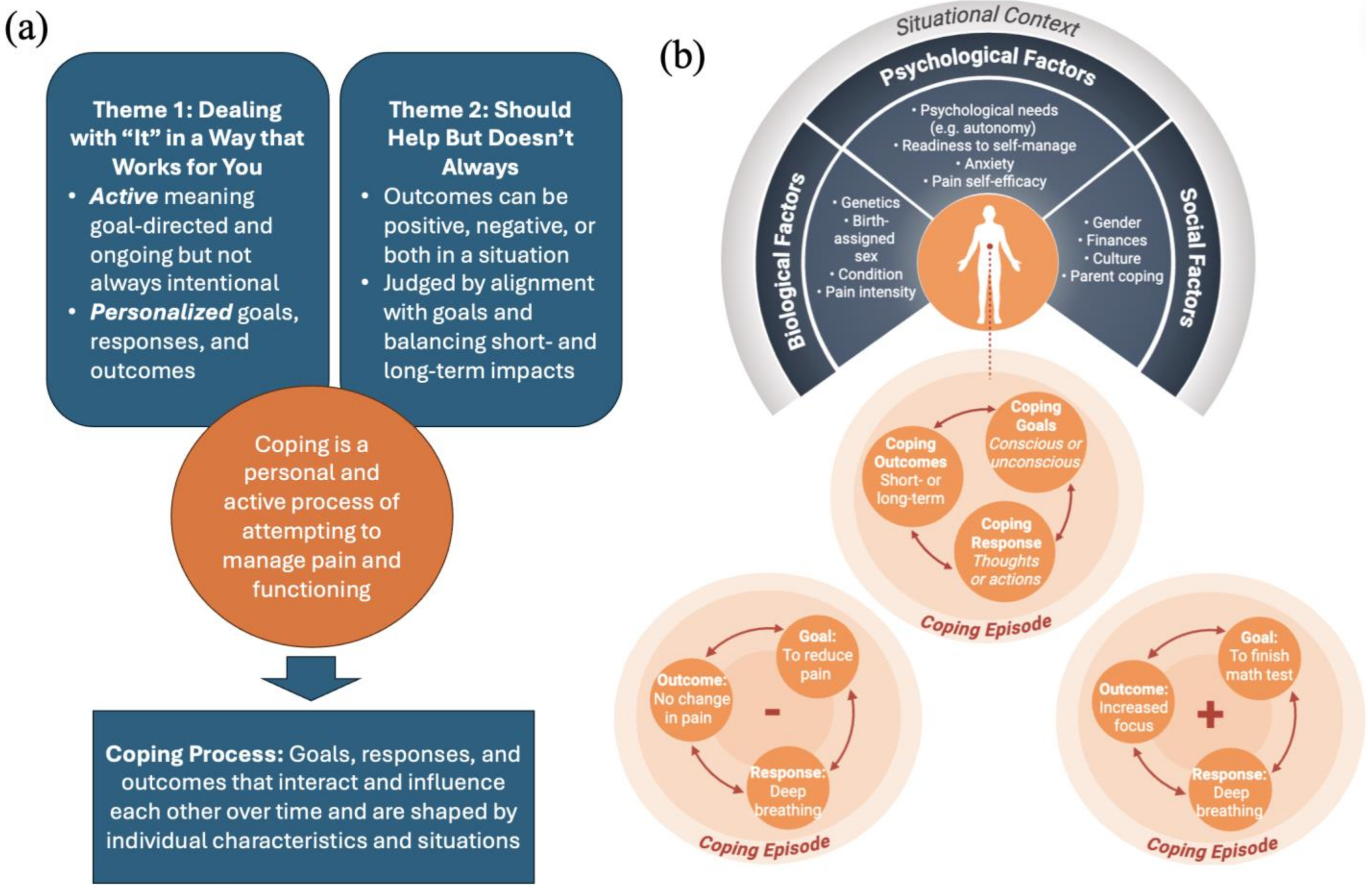

Figure 3. (a) Summary of themes from reflexive thematic analysis informing the definition of coping and highlighting adolescents' agreement with its operationalization as a process. (b) Visual representation of the coping process, adapted from the integrative model (15) and refined with adolescent feedback. An example illustrating effective (+) and ineffective (+) coping attempts using the same coping response based on different coping goals.

Figure 3(a) provides a summary of themes produced from reflexive thematic analysis that were used to formulate the above definition and a key takeaway from the qualitative content analysis that adolescents agreed with the operationalization of coping as a process. Figure 3 (b) is a visual representation of the coping process that reflects an adaptation of the integrative model [14] through integrating insights and feedback from adolescents in this study. The figure also provides an example of potential appraisals of effective and ineffective coping attempts using the same coping responses, denoted by a "+" and "-" symbol, respectively. These appraisals are determined by the alignment between coping goals and outcomes within a given context. Adolescents agreed that greater alignment increases the likelihood of reusing that coping response in the future. One adaptation they recommended included specifying that coping outcomes vary in terms of how helpful it is in the short and long-term. Another primary suggested change was the circular as opposed to linear representation of the coping process to allow flexibility in processing coping episodes by beginning at any point in the process instead of coping goals. For example, an adolescent may be able to first identify their coping response before gaining insight into underlying coping goals present in that moment. This change aligns with adolescent perceptions that coping can occur with or without conscious awareness. Another recommendation was to include factors in the model that influence people's coping goals, responses, and outcomes. The factors included at this stage reflect some of those highlighted as important in the literature and currently reflected in the integrative model [14]; as part of the larger research program, we are investigating which social identity and situational factors are deemed important by adolescents with chronic pain themselves.

Strengths, Limitations, and Future Directions

This paper is the first to qualitatively explore how adolescents with chronic pain define coping, which is critical to evaluating and adapting current theoretical frameworks for coping in pediatric chronic pain contexts. Qualitative research is recommended for theory application, testing, and refinement when researchers integrate both deductive and inductive approaches because it allows for supporting, contradicting, refining, and expanding evidence for a theory or conceptual model, ultimately building upon existing knowledge instead of contributing to further confusion or fragmentation [39]. In addition, inclusion of patient perspectives into the definition of coping in the context of chronic pain is critical for adapting assessments and interventions to be more developmentally and contextually relevant.

Another notable strength of this research was its inclusion of participants from diverse ethnic, socioeconomic, geographic, and gender backgrounds, as well as a range of chronic pain conditions, an approach that enriches the understanding of coping across varied perspectives. Moreover, limiting the sample to adolescents aged 14–19 enabled a more focused examination of this specific developmental period. Accordingly, the proposed definition and model adaptations are well-positioned to capture the perspectives of adolescents navigating chronic pain within varied sociocultural contexts.

This study is, however, not without limitations. While the study's sample size is appropriate for qualitative research [31–33] and has diverse representation, the insights drawn are representative of a small group of adolescents with chronic pain who were predominantly White, cis-gender females. Adolescents who participated in this research represent those who have access to technology for online participation and who were motivated to share their perspectives. In addition, all adolescents in this sample had received some form of pain focused treatment, with the majority (62%) engaging in psychological interventions. These experiences likely influenced their perceptions of coping, aligning them more closely with clinical perspectives. Future research is needed to continue to test and refine the proposed definitions across more diverse clinical and nonclinical populations of youth with chronic pain. While steps were taken to mitigate confirmation bias, including ongoing consultation with a patient partner and collaborators, future research should continue to explore the relevance and applicability of the model across diverse patient experiences.

Conclusion and Clinical Implications

The results of this study suggest that adolescents' perspectives on coping with chronic pain align with the flexible, process-oriented conceptualization offered by the integrative model. Adolescents perceive coping as always active and personal, but can vary in terms of how intentional and helpful it can feel. Through incorporating adolescent perspectives into the model, this study offers conceptual clarity and language to align the perspectives of adolescents living with chronic pain with other stakeholders' perspectives (e.g., researchers, clinicians, caregivers). Based on these insights, it is critical that research and clinical discussions shift from prescribing "correct" strategies toward collaboratively exploring coping in patient-centered, goal-oriented ways. Specifically, researchers and clinicians may want to avoid relying solely on questionnaires or framing coping responses as either "adaptive" or "maladaptive" without having discussions with youth to capture their personal goals and appraisals as well as information about situational factors impacting their coping. Research implications include improving the validity of measures and our ability to interpret and consolidate research findings. Within clinical contexts, the integrative model may help to provide psychoeducation that increases patients' self-awareness and offers validation of how coping with chronic pain is complex and challenging. Healthcare providers guided by this model may consider a nonjudgmental, open stance focused on understanding the patient’s goals and factors shaping their coping preferences and outcomes thereby facilitating individualized coping plans that when practiced may translate into more effortless and sustainable coping habits over time.

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‘Dealing with It in a Way That Works for You’: Adolescent Perspectives on Defining Coping in the Context of Pediatric Chronic Pain

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Abstract

~~Objectives:~~ ~~ ~~Coping is essential in managing pediatric chronic pain, yet current conceptualizations overlook its complexity and ~~the~~ lived experiences ~~that shape it~~. ~~The objectives of this study were two-fold.~~ We investigated: (1) adolescents' definitions ~~on~~ of coping and (2) their perspectives on the integrative model, a previously proposed ~~proposed~~ framework ~~that draws from the broader coping literature to characterize variability in pain coping~~capturing~~es~~ motivational, transactional, and biopsychosocial influences on coping.

~~Methods:~~ Twenty-one adolescents ages 14-19 years old with chronic pain from Canada, the United States, and United Kingdom participated in semi-structured interviews concerning their understanding of coping (objective 1) and feedback on the integrative model (objective 2). ~~Targeted~~ R~~r~~ecruitment through online platforms, pain clinics, and organizations serving gender and ethnic diverse youth were used ~~to capture diverse perspectives~~. Data were analyzed using reflexive thematic analysis (objective 1) and qualitative content analysis (objective 2).

~~Results:~~ For objective 1, two themes were generated. Theme 1, "dealing with it in a way that works for you", described ~~how~~ adolescents' view of coping as an active, personal process involving effort and trial-and-error, occurring with or without conscious awareness. Theme 2, "coping should help but doesn't always" captured how coping is often portrayed as inherently positive, but outcomes can be ~~unhelpful or ineffective~~negative. For objective 2, adolescents identified strengths and improvements for the integrative model related to clarity/accessibility, alignment with lived experiences, and supporting coping plans. For example, while adolescents described the model helpful and easy to understand, they suggested ways to depict the model visually and with greater flexibility to fit different situations. ~~We proposed a~~Results led to a new definition of coping and ~~revised~~revision of the integrative model to align with adolescent

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perspectives; ~~and discussed~~ advancements for clinical practice are discussed.~~the content of the integrative model generally resonated with adolescents and was viewed as useful for improving coping interventions. Some revisions were suggested.~~

Perspective: This article demonstrates that adolescents perceive coping as a personal, active **process that various in intentionality and effectiveness. The results provide support for the** integrative model and informs a more applied conceptualization of coping to advance research and clinical practices in the context of pediatric chronic pain.

Key Words: Coping, Chronic Pain, Adolescents, Pediatric, Qualitative

~~**Conclusions: Adolescents with chronic pain hold personal, nuanced understandings of coping. Aligning healthcare providers' perspectives with patients may enhance clarity and ultimately support better outcomes.**~~

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Introduction

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Chronic pain is prevalent in adolescents (ages 10–18) exacerbating a period of already heightened psychosocial vulnerability (1–3). ~~A~~ A primary aim of psychological interventions for pediatric chronic pain is to ~~promoting~~ promote effective coping ~~skills~~ (4,5), defined as the 'use of intentional and effortful thoughts or behaviors to manage the internal and external demands of stressful situations or experiences' (6,7). This definition demonstrates that coping is a complex, multifaceted construct. ~~Additionally, cAcross t~~The broader coping literature indicates that~~,~~ ~~c~~coping varies across health conditions (8)~~.~~ ~~-~~over~~and across~~ development ~~with~~alongside changes in perceived control and access external supports (e.g., caregivers, peers) ~~influence how youth cope across development~~ (9–11). ~~(9)(10,11)~~

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A recent scoping review of the pediatric (ages 0–21) chronic pain coping literature identified key conceptual gaps (12)~~{Citation}~~. First, fewer than 10% of studies cited a theory, and no theories were developed or validated among youth with chronic pain specifically, which is important given that pain in this context is often less predictable and controllable than for chronic illnesses (8). Second, existing models categorize coping responses by type (e.g., distraction, problem-solving) and as “adaptive” vs. “maladaptive”, despite ~~inconsistent~~ evidence suggesting coping varies across individuals and contexts. The predominance of female Western samples (12) further limits generalizability. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of “passive and maladaptive” (13). Lastly, an overreliance on quantitative methods (e.g., questionnaires) for conceptualizing coping limits insights into factors shaping coping.~~, yet, evidence-based practices for pain coping are limited by inconsistent conceptual models which do not apply well across individuals.~~

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~~Specifically, a scoping review of pediatric pain coping identified numerous measures, including 22 questionnaires with documented psychometric properties, and only 7.2% of studies guided by theory (6). Moreover, no theory and only five questionnaires were developed in pediatric chronic pain populations (6). A recent systematic review of qualitative studies involving adolescents with chronic pain advanced our understanding of coping as self-directed efforts (e.g., distraction) and external supports (e.g., family/friends) (14). However, previous studies asked adolescents about their experiences living with chronic pain rather than their definitions of coping. Capturing adolescents' language is essential for creating a conceptualization that resonate with patients.~~

An integrative model of the coping process was proposed to apply process-oriented theories of coping with stress from the adult literature to understanding coping with pediatric chronic pain (14). In this model, coping is operationalized as a process involving goals, responses, and outcomes (14,15): goals are one's intentions for coping and motivate responses; responses are cognitive or behavioral strategies; and outcomes are the consequences of responses, indicating an effective or ineffective coping attempt. Drawing on motivational and transactional theories (16,17), the model emphasizes how coping is influenced by both internal drives for relatedness, competence, and autonomy as well as person–environment interactions, including situational demands (e.g., social context, time pressures) and personal resources (e.g., finances, cognitive capacity); (for more details, see Nabbijohn & McMurtry, 2024). However, the integrative model has not been evaluated for its validity or applied value in adolescent chronic pain.

apply~~of from~~~~Coping is currently defined as the 'use of intentional and effortful thoughts or behaviors to manage the internal and external demands of stressful situations or experiences'~~

~~(8,9) and is typically operationalized by nomothetic models that categorize "adaptive" versus "maladaptive" coping (10). These conceptualizations fail to capture the multifaceted nature of coping (i.e., stressor, intention, action, and outcomes) and variability across people and situations. Moreover, the predominance of female, Western samples (6) limits our understanding of coping within socioculturally diverse communities. For example, contrary to current conceptual models, Black people in the United States report experiencing prayer as an active and adaptive coping response instead of a "passive and maladaptive" response (11).~~

~~Coping has also been operationalized as a process involving goals, responses, and outcomes (14,15). Coping goals motivate coping responses; coping responses are cognitive or behavioral strategies employed whereas outcomes are the consequences of these responses, indicating an effective or ineffective coping attempt(16). These process-oriented theories are flexible and breaks coping down into tangible parts, which help to understanding variability across people and situations. Motivational models emphasize the role of goals in shaping coping responses (16,17), whereas the transactional model suggests that person-environment interactions influence coping responses and outcomes (18). The Integrative Model of the Coping Process (herein "the integrative model") was more recently proposed to integrate these theories to understand the full coping process (14). This model also incorporates biopsychosocial factors known to influence coping goals, responses, and outcomes. However, the integrative model was informed by general coping literature and developed by researchers; a qualitative approach is well-suited to evaluate its relevance by including perspectives of those with lived experience.~~A recent systematic review of qualitative studies involving young people (ages 12-24) with chronic pain advanced our understanding of adolescent experiences living with chronic pain and provided insight into common coping responses reported in qualitative research (18). Overall, chronic pain was described as both disruptive and identity-shaping, with young people perceiving their lives as markedly different from their peers; for example, these youth often miss out on opportunities for social and economic growth and depend on caregivers (19). Coping responses reflected self-directed efforts (e.g., distraction) and external supports (e.g., family/friends), tailored to developmental needs, suggesting that effective support balance fostering autonomy with shared decision-making alongside healthcare providers (18). However, youth-informed theories linking lived experiences to coping response selection are limited (18), as only one study provided insight into a model grounded in adolescents' lived experiences (20). This study, focused on adolescents with arthritis, identified how "maintenance" (normalizing pain) and "management" (reducing pain) coping goals shape coping responses, underscoring the importance of adolescents' motivations in coping. Yet, adolescents' personal definitions of "coping" in the context of chronic pain remains unexamined, limiting our ability to judge the conceptual alignment among patients, researchers, and healthcare providers. Efforts to incorporate adolescents' perspectives into theory may help to advance more meaningful and relevant research and clinical practices.

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This study is the first of two studies drawn from a larger qualitative interview project examining how adolescents understand and use coping to manage chronic pain. Here, we focused on adolescents' (1) definitions of coping and (2) perspectives on a proposed conceptualization informed by the integrative model. The second ~~This two-part study reflects data from a larger qualitative interview project investigating adolescents' conceptualizations of coping and awareness of factors influencing coping with chronic pain. This paper presents two distinct but related parts of that larger project: Part 1 examined adolescents' personal definitions of coping in the context of chronic pain, while Part 2 explored their perspectives on a simplified~~

~~version of the integrative model[1]. These studies are the first to capture explicit definitions of~~study will explore adolescent perceptions of social identity and situational factors that shape coping and healthcare needs. Together, insight gained into adolescent perspectives on coping ~~may~~can inform more meaningful and effective theoretical representations, clinical discussions, and interventions.~~ “coping” from adolescents with chronic pain, which can help to integrate patient voices into theory.~~

~~Overall~~ Methods

~~The same data collection procedures, participants, and questionnaire data are used in both study parts; however, different interview questions and qualitative analytical approaches were employed as described within their respective sections.~~

Participant Recruitment

Adolescents were eligible to participate in this study if they were: between 14-19 years old; living in Canada, the United States of America, the United Kingdom, or Australia; experiencing/experienced chronic pain for longer than three months; and able to understand, converse, and read in English. The age range of 14-19 years old was chosen because adolescence is a period of increasing autonomy, shifts in cognitive and emotional regulation, and changes in independence and social support networks, all of which likely shape how people define and engage in coping (21). Selecting participants within the same developmental stage allows for a more coherent understanding of coping during this critical period. Additionally, adolescents were

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~~[1] The proposed model reflects a simplified version of the integrative model described by Nabbijohn and McMurtry (2024) as depicted in Supplemental Figure 1. This version captured the breaking down of coping down into component parts (i.e., goals, responses, outcomes) and understanding the process-oriented relationship between these parts. Variability in coping goals, responses, and outcomes across people, place, and situations was alluded to but specific factors acting on the coping process were not stated to avoid biasing participant responses. See full interview guide for more information: OSF Link.~~

chosen to ensure participants possessed the cognitive and language abilities necessary to reflect on their experiences and engage in discussions around the conceptualization of an abstract construct.

Adolescents without access to the internet and a device to participate online and/or with major developmental delays that posed significant barriers to verbal communication were excluded. Adolescents aged 17 years or younger were also required to have a parent or legal guardian's consent to participate in the study. Due to attempts made by individuals to impersonate eligible participants, screening procedures to detect and deter fraudulent participants were used (22), including the requirement to provide a phone number for telephone screening prior to participation, showing a government issued photo ID at the start of the interview, and keeping the camera on during the interview. Participants who were not able to follow these steps were excluded. All eligible participants who completed the study were provided a $25 Amazon gift card.

Participants were recruited through advertisements, snowball sampling, and word of mouth, both online (via social media) and within specialized pediatric ~~pain clinics~~ pain-management programs (e.g., McMaster Children's Hospital, Stollery Children's Hospital, Comfort Ability Program) and ~~programs~~ non-profit patient support/advocacy organizations (e.g., ~~Comfort Ability Program,~~ Fibromyalgia Association Canada, National Migraine Centre, Versus Arthritis). To ensure diverse perspectives were included (12), advertisements were also shared with special groups on social media (e.g., Facebook) and organizations serving adolescents diverse in gender and ethnic identity. While no formal quotas were applied, the study aimed for at least 25% gender-diverse, cis-gender male, and racial/ethnic minority participants given the known prevalence of these demographics presenting at pain clinics (23,24). Demographic information collected were monitored by the lead researcher ~~and used to seek representation of gender diverse and racial/ethnic minority adolescents.~~ to assess the sample composition and guide targeted outreach, such as asking clinicians sharing recruitment materials to be mindful of particular demographics and following up with recruitment within organizations serving gender and racial/ethnic diverse youth.

Materials

Demographic Questionnaire. A questionnaire was developed to capture self-reported demographic data consisting of age, gender, ethnicity, socioeconomic status (SES), pain characteristics (e.g., pain location, pain onset, pain intensity), and place of residence (i.e., country, province/state). This information was collected and summarized in this study for the purpose of characterizing the sample to provide relevant background context for interpreting participants' experiences. Given that adolescents may not know the details of their caregiver's income or occupation, a subjective measure of SES was used by asking adolescents: "How would you describe your family's access to resources and money?" with response options of 1 = "less than enough"; 2 = "enough", and 3 = "more than enough" (25).

~~**PROMIS® Pediatric Pain Intensity Measure.**~~ The PROMIS® Pediatric Pain Intensity Measure (26) was administered to characterize pain intensity within the sample. ~~used to measure pain intensity.~~ Adolescents were asked to rate their "usual pain" and "worst pain" within the past 7 days and "pain right now" on a 4-point Likert scale ranging from 0 (had no pain) to 4 (very severe). The PROMIS® Pediatric Pain Intensity measure was developed to adapt widely used and studied measures of pain intensity using direct input from adolescents living with chronic pain. Specifically, based on patients' feedback, the inclusion of fewer, clinically meaningful items and response options was deemed as preferable to the traditional numeric rating scale for use in pediatric populations who experience chronic pain (26). The PROMIS® Pediatric Pain Intensity Measure was found to demonstrate good convergent and discriminant validity in adolescents 8 to 18 years of age (26).

Interview Schedule. A semi-structured interview schedule for the larger project was initially developed by ANN, drawing on her work conducting a prior scoping review of the pediatric chronic pain coping literature (12), which provided a comprehensive understanding of how coping has been conceptualized and key gaps in the literature. Questions were also informed by ANN's familiarity with the broader coping literature used to inform their proposal of the integrative model of the coping process (14). The interview schedule was developed and revised i~~ i~~n consultation with coauthors (CCM, LC, and AJ) to ensure clarity and alignment with the study aims~~to extend previous research on coping~~. Two of the coauthors (LC and AJ) were not involved in the scoping review or development of the integrative model but have extensive experience with pediatric chronic pain research and qualitative methods, ~~thereby supported with~~including enhancing methodological rigor and~~,~~ reflexivity~~, and reducing the potential for bias~~. The interview guide was piloted with two adolescents without chronic pain (ages 16 and 18) and edited to ensure that the language and demands of the interview were developmentally appropriate. In addition, it was further revised in consultation with two persons with lived experience (i.e., an 18-year-old patient partner and a graduate student with both personal experience with chronic pain and expertise conducting interviews with adolescents with chronic pain). The full interview included seven primary questions along with optional probing questions to encourage elaboration from participants as needed. The total interviews took between 50 and

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75 minutes to complete. The full interview schedule can be viewed using the following link: https://osf.io/7vnqa/files/osfstorage/68af0f6c40f5d9c1ed161f58.

Of relevance to the current work, ~~this~~ questions ~~included~~ focused on exploring: (1) adolescents' personal conceptualizations of coping and (2) feedback on a simplified version of the integrative model. ~~(more detailed information on the interview questions in part 1 and part 2 are discussed in their respective sections below).~~ More specifically, ~~T~~to gain insight into how adolescents define coping in the context of their chronic pain, participants were asked, "What does coping with chronic pain mean to you?" Follow-up probes such as "Can you tell me more?" and "What does successful or unsuccessful coping mean to you?" were used as required to encourage participants to elaborate on their initial responses.

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~~Interview questions for Part 2 were analyzed separately. Part 2 engaged adolescents~~ Next, ~~in reflecting on a process-oriented description of coping underlying the proposed integrative model.~~ a~~A~~dolescents were provided with the following verbal description of a simplified version of the integrative model[1] along with along with a visual representation capturing the process-oriented nature of coping (Figure 1):

"Coping with chronic pain is sometimes described as a process involving three parts: coping goals, coping strategies, and coping outcomes. Coping goals are the reasons for using a coping strategy, such as to feel less pain or to improve our mood. Our coping goals influence our coping strategies, which are the actions we use to cope with our chronic pain experience. These can be mental strategies such as thinking positive thoughts or behaviors such as talking to

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[1] The proposed model reflects a simplified version of the integrative model described by Nabbijohn and McMurtry (2024) as depicted in Figure 1 (see Supplemental Figure 1 for the full model). This version captured the breaking down of coping down into component parts (i.e., goals, responses, outcomes) and understanding the process-oriented relationship between these parts. Variability in coping goals, responses, and outcomes across people, place, and situations was alluded to but specific factors acting on the coping process were not stated to avoid biasing participant responses.

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someone, taking medications, or exercising. Coping outcomes are the consequences of using a particular coping strategy, such as feeling less pain or feeling more pain. Another example would be feeling less anxious or feeling more anxious. Coping outcomes may be different for different people or situations and can affect how we cope in the future."

To elicit feedback on the model, participants were asked: "What are your thoughts about this way of understanding coping?" Optional probes, such as "what parts of this description do(es) or do(es) not make sense to you?" or "what would you change or add?" were used as needed to facilitate elaboration.

Figure 1. A visual representation of the coping process presented to participants. ~~(Part 2)~~

Study Procedure

Ethics approval was obtained by the Research Ethics Board (REB) at the University of Guelph (#21-01-009). Prospective participants (age ≥18) or primary caregivers of youth (age <18) contacted ANN via email to sign up for the study, upon which they were invited to participate in a screening interview via telephone. During the phone screening, participants (age ≥18) and/or caregivers of adolescents under age 18 were provided more information about the study purpose and steps, and asked questions to assess the adolescent's eligibility.

After initial positive screening for eligibility, an online meeting (via Zoom) was scheduled with ANN. At this online meeting ~~(duration ~60 minutes)~~, eligible participants (and their caregivers if under the age of 18) were first given information about the study and the opportunity to provide verbal assent/consent. Caregivers of any participants under the age of 18 were asked to leave the room following the consent process to provide adolescents privacy in their participation in the study. Adolescents completed the demographic questionnaire via Qualtrics online survey software (27) followed by the interview. Participants were provided a 5-minute break half-way through the interview and at any other point as requested.

Field notes were made by ANN both during and immediately after each interview. Interviews were transcribed verbatim by trained research assistants and fully anonymized. All completed transcriptions were then reviewed by ANN while listening to the audio recording before being uploaded into NVivo 12 (released in March 2020), a qualitative data analyses software package (28)

Data Analyses

To describe the sample's demographic and pain-related characteristics, ~~in both Part 1 and Part 2,~~ the Statistical Package for the Social Sciences (SPSS v. 29) was used to compute means, standard deviations, ranges, and/or frequencies, as appropriate, for: age, sex, gender, ethnicity, perceived socioeconomic status (SES), country, pain intensity variables, pain duration, family history of pain, pain locations, and interventions used.

The primary analyses to address~~for~~ both ~~Part 1 and Part 2~~research questions were qualitative. However, distinct ~~interview questions and~~ analytic approaches were employed ~~to address different research aims~~for each. The first research question ~~Part 1~~ explored participants' definitions and descriptions of coping and was analyzed using reflexive thematic analysis to capture nuanced patterns and meanings in their responses ~~capture~~as well as the role of the researcher in these interpretations (29). In contrast, qualitative content analysis (30) was ~~used in Part 2~~used to address the second research question on adolescents' perceptions of elements of the integrative model, as it enables systematic categorization of explicit feedback and minimizes interpretive influences of the researchers, ~~sought to summarize participants' feedback on a simplified version of the integrative model, to~~ providinge a structured overview of key points. ~~The following sections present the methods, results, and discussion specific to each study separately.~~

~~Part 1: Adolescents' Personal Definitions of Coping in the Context of Chronic Pain~~

~~**The primary objective of this study was to examine how adolescents conceptualize coping in the context of living with chronic pain.**~~

~~Part 1 Methods~~

~~*Interview Questions*~~

~~**To gain insight into how adolescents define coping in the context of their chronic pain, participants were asked, "What does coping with chronic pain mean to you?" Follow-up probes such as "Can you tell me more?" and "What does successful or unsuccessful coping mean to you?" were used as required to encourage participants to elaborate on their initial responses.**~~

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~~*Data Analysis*~~

Reflexive T~~t~~hematic A~~a~~nalysis ~~(RTA).~~ Reflexive TA (29) was conducted to explore participants' definitions and descriptions of coping. Given that coping is a complex, dynamic construct (12), and that TA broadly emphasizes participants' subjective experiences, TA ~~is especially well-suited for~~is useful for exploring the coping process through an individualized

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lens which considers motivational, transactional, and biopsychosocial influences. Reflexive TA was chosen over other TA approaches due to its emphasis on researcher reflexivity, acknowledging how personal perspectives, study design, and disciplinary context shape data interpretation. As such, concept of data saturation was not applied as an reflexive TA approach suggests themes are generated through interpretive engagement rather than discovered (31). A target sample size of at least 20 participants was determined based on guidance from extant literature (32,33) and feasibility, and emphasis was placed on depth, nuance, and richness of the data.

To ensure participant voices remained central to the analytic process, the analysis followed an experiential, essentialist approach, focusing on semantic (explicit) features of the data and using an inductive approach to generating codes and themes. The follow six iterative steps of reflexive ~~R~~TA were followed (34): (1) familiarization with the data through repeated reading of interview transcripts; (2) initial coding of segments relevant to the research question; (3) theme development by clustering codes around shared ideas; (4) developing and reviewing themes to ensure coherence and meaning; (5) refining, defining, and naming themes, including illustrative quotes; and (6) writing up the results.

The author ANN took part in all stages of this analysis. During stages two and three (i.e., generating codes and themes), ANN consulted with CMM to explore alternative ways of viewing the data. At stages four and five (i.e., reviewing, refining, and defining themes), ANN consulted with the full research team, which included three investigators (CMM, LC, AJ) and a patient partner (CM). All authors supported the write up in stage six. In addition, throughout the six-step process, ANN also engaged in reflexive journaling to ensure rigor and reflexivity (35)

Assessing Rigor in Reflexive Thematic Analysis.

In alignment with a~~n~~ reflexive TA approach, we acknowledge that our backgrounds, experiences, and values shape the way we engage with this research, from data collection to analysis and interpretation. As clinicians, researchers, and people with lived experience, we recognize that pain is more than a medical issue; it is a complex and multifaceted experience that shapes how people live, connect with others, and feel emotionally. We acknowledge that themes do not “emerge” from the data in an objective manner but are actively constructed through our engagement with participant narratives. Establishing rigor is a critical component of high-quality qualitative research. Multiple strategies were employed to enhance trustworthiness, credibility, and transparency, which were with aligned principles of reflexive TA (29,34,36) and evaluated using a 20-question tool for evaluating TA research quality (37):

1. Conceptual coherence and methodological alignment: The choice of reflexive TA was justified based on its conceptual fit with the research questions, theoretical underpinnings, and methods of data collection.
2. Credibility and rigor: Ongoing discussions among the research team fostered shared analytical thinking in the refinement of codes and development of themes. The team included researchers and clinicians whose perspective on coping are shaped by their familiarity with the extant literature and clinical experiences working with pediatric pain. ANN and CMM coauthored the original paper on the integrative model. The research team also included individuals with lived experience with chronic pain. These unique perspectives were balanced through regular consultation, ensuring diverse perspectives informed the analysis. In addition, ANN engaged in reflexive journaling and selected a sematic, inductive approach to analysis. Participant quotations were

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Formatted: Font: Not Bold, Not Italic integrated to ensure that interpretations remained grounded in the data. For each quotation, a pseudonym based on arbitrary theme (i.e., colours) is provided along with the participant's gender identity and age (e.g., Indigo, Cisgender female, age 18).

3. Reflexivity: Reflexivity was treated as a continuous, critical stance rather than a single procedural step. The research team actively acknowledged their subjectivities and considered how their backgrounds, experiences, and values shaped all stages of data collection, analysis, and interpretation. ~~Table 1 provides individual positionality statements to promote transparency and reflexivity in our approach and interpretations.~~For instance, team members with personal, relational, and/or clinical experiences often drew on those experiences, leading them to emphasize contextual aspects of coping, while members with extensive research expertise drew more readily on established clinical frameworks. In addition, ANN was aware throughout the process how her familiarity with the coping literature may have sensitized her to information aligned with existing frameworks. This awareness informed reflexive discussions that helped challenge assumptions and deepen, rather than constrain, the analytic interpretation. Supplemental Table 1 provides individual positionality statements to promote transparency and reflexivity in our approach and interpretations.
4. Transparency and dependability: Detailed documentation of the data collection and analysis process was maintained, including coding in NVivo, memo-writing, and reflexive journaling. These practices support dependability and confirmability by providing an audit trail of analytic decisions.

~~—~~Impact and resonance: Themes were developed by patterns of shared meaning, rather than simple topic summaries, to ensure applied value and theoretical significance.~~.~~

5.

Qualitative Content Analysis. ~~Data Analysis~~

To describe adolescents’ feedback on the integrative model, Elo and Kyngäs (2008)’s three-phase (preparation, organization, and reporting) qualitative content analysis was used. In contrast with quantitative content analysis, qualitative content analysis ensures that all feedback was captured, regardless of how frequently a particular point was mentioned. In addition, this approach was chosen for its flexibility and ability to systematically summarize direct and descriptive responses. Given that participants were asked specific questions about their feedback, their responses were closely tied to those prompts, requiring minimal interpretation. Accordingly, we adopted a realist epistemological stance, assuming participants’ responses provide direct insight into their experiences.

The analysis was conducted by coding explicit, observable elements of the data using a combined deductive and inductive approach. Specifically, participant responses were first organized within a predefined framework (strengths, weaknesses, and suggested changes), and then inductively analyzed to identify meaningful categories that captured key aspects of their feedback. During the preparation phase, ANN familiarized themselves with the data by repeatedly reading the transcripts. In the organization phase, open coding was performed by making notes that guided the development of initial codes. These codes were then reviewed and refined by CMM, with ANN drafting preliminary descriptions for each. During the reporting phase, research team (ANN, CMM AJ, LC, and CM) collaboratively discussed and revised the codes and overarching categories as necessary to ensure accuracy and coherence in the write-up.

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~~*Assessing Rigor in Reflexive Thematic Analysis*~~

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~~*In alignment with an RTA approach, we acknowledge that our backgrounds, experiences, and values shape the way we engage with this research, from data collection to analysis and interpretation. As clinicians, researchers, and people with lived experience, we recognize that pain is more than a medical issue; it is a complex and multifaceted experience that shapes how people live, connect with others, and feel emotionally. We acknowledge that themes do not "emerge" from the data in an objective manner but are actively constructed through our engagement with participant narratives. Establishing rigor is a critical component of high-quality qualitative research. Multiple strategies were employed to enhance trustworthiness, credibility, and transparency, which were with aligned principles of RTA (27,29,31) and evaluated using a 20-question tool for evaluating TA research quality (32):*~~

1. ~~*Conceptual coherence and methodological alignment: The choice of RTA was justified based on its conceptual fit with the research questions, theoretical underpinnings, and methods of data collection.*~~
2. ~~*Credibility and rigor: Ongoing discussions among the research team fostered shared analytical thinking in the refinement of codes and development of themes. The team included researchers and clinicians whose perspective on coping are shaped by their familiarity with the extant literature and clinical experiences working with pediatric pain. ANN and CMM coauthored the original paper on the integrative model. The research team also included individuals with lived experience with chronic pain. These unique perspectives were balanced through regular consultation, ensuring diverse perspectives informed the analysis. In addition, ANN engaged in reflexive journaling and selected a sematic, inductive approach to analysis. Participant*~~

~~***quotations were integrated to ensure that interpretations remained grounded in the data. For each quotation, a pseudonym based on arbitrary theme (i.e., colours) is provided along with the participant's gender identity and age (e.g., Indigo, Cisgender female, age 18).***~~

3. ~~***Reflexivity: Reflexivity was treated as a continuous, critical stance rather than a single procedural step. The research team actively acknowledged their subjectivities and considered how their backgrounds, experiences, and values shaped all stages of data collection, analysis, and interpretation. Table 1 provides individual positionality statements to promote transparency and reflexivity in our approach and interpretations.***~~
4. ~~***Transparency and dependability: Detailed documentation of the data collection and analysis process was maintained, including coding in NVivo, memo-writing, and reflexive journaling. These practices support dependability and confirmability by providing an audit trail of analytic decisions.***~~

~~***Impact and resonance: Themes were developed by patterns of shared meaning, rather than simple topic summaries, to ensure applied value and theoretical significance.***~~***Assessing Rigor in Qualitative Content Analysis.*** s

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Our approach to ensuring trustworthiness across all three stages of the qualitative content analysis adhered to an established checklist developed by Elo and colleagues (38). In the preparation phase, interview questions were developed with input from the research team and a patient partner and piloted with adolescents to ensure clarity and relevance. A semi-structured interview format with primary and probing questions was adopted to allow inductive responses while minimizing interviewer influence. ANN also engaged in reflexive journaling to maintain awareness of her role in shaping interactions. To strengthen dependability, adolescents were purposively sampled across gender, ethnic, and socioeconomic contexts to capture diverse perspectives.

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In the organization phase, transparency was maintained by documenting the development and refinement of categories. Congruent with good practice, a single coder approach was used, yet familiarization, open coding with audit trails, and collaborative discussions among the patient partner and research team with discrepancies resolved by consensus were used to ensure categories accurately reflected the data, enhancing credibility and confirmability.

In the reporting phase, findings were presented systematically, first within the framework of strengths, weaknesses, and suggested changes, and then refined into categories. Connections between data and interpretations were demonstrated in a table with representative quotations, ensuring participants’ voices were evident. Categories were distinct and comprehensive, capturing all participant ideas regardless of frequency. Overall, results are conveyed with clarity, scientific rigor, and a full account of the analytic process to support trustworthiness.

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~~Author~~	~~Positionality Statement~~
~~A. Natisha Nabbijohn~~	~~ANN is a first-generation Canadian, with a Guyanese background, and a cis-gender woman training in child and adolescent clinical psychology. She currently holds a BSc and MA in Clinical Psychology and is working towards completing her PhD. She has a background in science (i.e., biology and psychology) and her current work center on promoting the well-being of youth living with chronic pain, with a specific interest in pediatric pain coping. While ANN is well-versed with the empirical and theoretical literature on coping and chronic pain and have witnessed the journey of family and friends with chronic pain, she is not a person with chronic pain. As the primary researcher, ANN acknowledges that without personal experiences with chronic pain, her engagement with and interpretation of the data is likely be shaped by clinical and research experience.~~
~~Dr. C. M. McMurtry~~	~~CMM is a white, third-generation Canadian, cis-gendered woman. She is an active researcher and clinician in pediatric (acute and chronic) pain, trained in clinical and health psychology. She has a personal history of recurrent pain now resolved.~~
~~Dr. Line Caes~~	~~LC identifies as a white, cisgendered woman residing in the United Kingdom. She is an active researcher in pediatric pain, trained in clinical and health psychology. Her research interests cover the social aspects of pediatric pain experiences, with a particular interest on the evolving parent-child interactions during painful experiences across the child's development. She has no personal experiences with chronic pain.~~
~~Dr. Abbie Jordan~~	~~AJ is white cis-gendered British woman who has a longstanding interest in studying pediatric chronic pain. She is particularly interested in learning about the experiences of adolescents with lived experience of chronic pain. AJ is herself a parent of adolescents, none of whom have experience of chronic pain. AJ is a health psychologist by discipline and typically adopts a big Q (Qualitative) approach to her work in the pediatric chronic pain field.~~
~~Ciara Mahaffy (patient partner)~~	~~Ciara has lived with Juvenile Idiopathic Arthritis Polyarticular RF negative subtype since she was a child. This rheumatic disease has given her chronic pain that she lives with every day. Throughout Ciara's assistance with this study, she was between the ages of 19 and 22. She is now a postgraduate student studying English Literature.~~

~~Note. Authors have chosen to share how their experiences have contributed to their interpretations regarding the present research.~~

~~**Table 1.** Authors' positionality statements.~~

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~~Part 1~~ Results

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Participants

In total, data were collected from 21 participants between ages 14 to 19 years old (*M* = 17.83, *SD* = 1.62). All participants who consented to participate completed the study in full. Table 1~~2~~ provides a summary of participant demographic and pain characteristics.

Demographic Variables		**Pain Variables**	
Sex, *n* (%)		**Years living with pain,** M years (SD), range	6.47 (4.14), 1.40-16.31
Female	17 (81.0)		
Male	4 (19.0)		
Gender, *n* (%)		**Pain intensity**, M (SD)	
Girl/Woman	13 (61.9)	Current	1.24 (.77)
Boy/Man	3 (14.3)	Average	1.62 (.87)
Agender	2 (9.5)	Worst	2.48 (.93)
Nonbinary	1 (4.8)		
Gender Fluid	1 (4.8)		
Prefer not to answer	1 (4.8)		
Ethnic identity, *n* (%)		**Pain location**, *n* (%)	
White	14 (66.7)	Head	9 (42.9)
Arab	4 (19.0)	Neck	3 (14.3)
South Asian	2 (9.5)	Back	2 (9.5)
Black/Caribbean	2 (9.5)	Hip	3 (14.3)
Chinese	1 (4.8)	Abdomen	4 (19.0)
Jewish	1 (4.8)	Widespread joint pain	4 (19.0)
		Musculoskeletal pain	4 (19.0)
		Multiple locations	10 (47.6)
Perceived SES, *n* (%)		**Interventions,** *n* (%)	
Less than Enough	3 (14.3)	Medication	16 (76.2)
Enough	9 (42.9)	Physical	16 (76.2)
More than Enough	7 (33.3)	Occupational	6 (28.6)
Prefer not to answer	2 (9.5)	Psychological	13 (61.9)
		CBT	10 (47.6)
		ACT	3 (14.3)
		DBT	1 (4.8)
		CAP	1 (4.8)
		Peer support	2 (9.5)
Country, *n* (%)		**Family history of pain,** *n* (%)	14 (66.7)
Canada	19 (90.5)		
United States	1 (4.8)		
England	1 (4.8)		

CBT = Cognitive behavioural therapy; ACT = Acceptance and commitment therapy; DBT = Dialectical behavioural therapy; CAP = Comfort Ability Program

Table 1~~2~~. Self-reported demographics and pain characteristics of participants in Parts 1 and 2 (*N* = 21).

Adolescents' Personal Definitions of Coping in the Context of Chronic Pain

Findings from the reflexive ~~R~~TA explore how adolescents conceptualize coping with chronic pain. When asked to reflect on the meaning of 'coping' in the context of their chronic pain, adolescents exhibited some difficulty articulating this concept. Instead, they often described a process or experience, essentially defining the term through personal examples, highlighting the complex and multifaceted nature of coping.

Two overarching themes were generated from adolescents' responses. The first theme, *Dealing with "It" in a Way That Works for You,* captures adolescents' descriptions of coping as individualized, directed effort to accept or control aspects of the chronic pain experience—whether that is the pain itself, their ability to function despite pain, or both simultaneously. The second theme, *Coping Should Help, But Doesn't Always*, reflects adolescents' views that coping is meant to be helpful, but outcomes can vary. Together, these themes provide insight into how adolescents conceptualize and make sense of coping in their daily lives.

Theme 1: Dealing with "It" in a Way That Works for You. To organize the data related to this theme, we identified two subthemes that illustrate the characteristics adolescents consider important when conceptualizing coping: *Active but Not Always Intentional* and *Personalization.*

Sub-theme: Active but Not Always Intentional. Adolescents unanimously described coping as an effort to *deal* with a specific stressor, which may entail accepting, managing, or attempting to control some aspect of the pain experience, without necessarily solving or eliminating the problem. One participant articulated this distinction by comparing treatment with coping as follows:

> *"A treatment is really aimed at resolving the problem, whether it be pain or the actual cause of the pain, and then coping is managing it without necessarily resolving it, it's floating, keeping afloat…You're not getting out of the water, yet at least but you're treading water." (Indigo, cisgender female, age 18)*

Using phrases like "dealing with it" or "managing it" are suggestive of coping being an active process because it implies an ongoing effort to engage with an identified problem to manage its impact. Other phrases commonly used that emphasize coping as having an active component included *"learning to manage"* and *"identifying things that have (not) worked"* – these suggest a continual, self-guided effort to evaluate and learn. Additionally, adolescents also emphasized the importance of putting forth effort to feel like they are coping. As such, while many participants reported using medication to cope with pain, some participants held a conflicting view about whether using medication truly constituted coping, since it does not require the same level of effort and learning and, therefore, felt that it was *"cheating" (Ivory, cisgender female, age 18)*. A sense of control over the stressor was seen as important, whether that be pain or something else. For example, one participant indicated that coping with chronic pain means dealing with the challenges that come up in their life related to the pain because that's where they can have more control and a clearer understanding of the situation. This participant also echoed coping as putting forth effort, such as "trying" or "pushing" through daily activities:

> *"I feel like coping to me means to have something under control. To be able to cope, it means you – you've understood really the situation, and you know how to manage it, and what to do in that situation, rather than being in the unknown […] Um, I think the definition of coping is really just always try – like when you're going through a pain, it*

> *becomes really easy to just feel like you have no power against like a bigger thing […] but everyone experiences a form of coping throughout their day... even just like getting out of bed in the morning… you are coping by pushing through, trying, and keep going" (Teal, cisgender man, age 17)*

However, it is important to note that while adolescents described coping as "active", they did not see it as always being an "intentional" process. Instead, coping was often described as ranging from automatic, instinctual behaviors to deliberate, effortful strategies, with the degree of intentionality being shaped by factors such as how effortful a coping response is to implement, the amount of experience one has coping with pain, and pain or symptom intensity. An example of a participant discussing the role of effort in determining intentionality is as follows:

> *"I think there's definitely automatic coping, and I think we do it in so many ways in our like daily lives that we don't even realize it…The purposeful ones are definitely like harder to put in place and continue doing, so even if it helps me, it is sometimes hard to regularly do it, for example, stretching and physiotherapy." (Violet, cisgender female, age 15)*

The continuing thread of effort reflected in adolescents' responses was not only seen as interacting with intentionality but also acknowledged to change with time. More specifically, many adolescents reflected on how coping responses initially require intentionality because they are unfamiliar, but then often become automatic with repetition and time. For example:

> *"When I first started it, I had to put in a lot of mental effort to do these things, to make these choices…Now it's just something that I do because I enjoy doing it. Not something I have to think about or put a lot of thought into, which I find is, is a lot more helpful." (Amber, cisgender female, age 18)*

Although coping may become more automatic and habitual with time, there are other factors that can drive automaticity such as symptom severity. Some adolescents noted that when pain or symptoms are intense, coping is more automatic because there is no time to think of goals or plan. However, when automatic or habitual coping responses are not enough to manage pain or its impact in a situation, adolescents may be more intentional about recruiting other more effortful or novel coping responses. For example:

> *I think definitely when you're in really bad pain and you know something helps you don't think about like 'oh I need to cope with this pain' it's more like 'I'm just going to go get this.' It's not like a goal to cope with it…unless it doesn't really work and I need to do more" (Magenta, cisgender female, age 14).*

Despite the varying degrees of intentionality, most participants recognized that coping tends to be goal-directed, even if they were not consciously aware of those goals in the moment. As such, even when adolescents report unconsciously framing their actions by their coping goals in the moment, they recognized in hindsight that many of their behaviours serve a desired function such as reducing pain, conserving energy, or maintaining functioning:

> *"Even like the instincts, they're automatic but they're built in a way where there is always a goal to help you either survive or react appropriately… Just because you act instantaneously doesn't mean you don't have a goal, it just might not be a goal that you chose, but automatically went with." (Fuchsia, cisgender female, age 18)*

Sub-theme: Personalization. A second important element in the quotation *"dealing with it in a way that works for you"* is the emphasis on personalization and flexibility. Firstly, the meaning of "it" – that is, the stressor perceived to be the focus of coping – varies across people and the situations. For many, "it" referred to the pain itself, with coping framed as an ongoing process of managing that experience. This includes strategies to endure pain during difficult moments, reduce its intensity in the moment, prevent it from getting worse in the future, as well as accept its persistent presence:

> *"I think [coping] accepting and learning to manage living with pain…For me, coping is for me how I deal with it [the pain], so when I'm talking about successful coping strategies, for me, it's normally things that have worked for me to help reduce my pain or help me deal with my pain in a more tolerable way." (Sepia, gender fluid, age 18)*

The quotation above also further highlights the personal nature of coping, as reflected in the participant's repeated use of the phrase *"for me",* indicating an awareness that one's coping preferences may vary from others. Outside of pain, another target of coping identified by adolescents was functioning. Many adolescents explicitly stated that any action supporting daily life could be considered coping, *"even if it doesn't necessarily help you with the pain" (Fuchsia, cisgender female, age 19)*. For example, coping was conceptualized as finding what helps one function and keep up with daily routines instead of fixating on or being drained by their pain:

> *"For me, it's just making it to like the end of the day or the end of the week or whatever. Like, giving myself an enough like strength, then enough energy to like, make it to wherever I've got to be." (Saffron, nonbinary, age 18).*

Beyond daily survival, many adolescents suggest coping functions to help them to engage in life at the level that is seen as "normal" or that meet one's expectations for themselves in psychosocial, physical, academic, and financial domains of life:

> *"My goal with coping is just to be able to like participate in my life in the capacity that I want to, because, the pain, it gets in the way of that a lot." (Periwinkle, nonbinary, age 18)*

Often though, adolescents were not able to make a clear distinction between the focus of coping being either pain or functioning, which emphasized the need to deal with both simultaneously, with efforts towards one likely influencing the other. On one hand, using coping responses to manage pain can promote one's ability to engage in various aspects of life, such as academics, social activities, or self-care routines. For example, one participant emphasized that effective coping is when pain feels more tolerable and, therefore, their functioning improves:

> *"Regulating myself and keeping myself like a stable spot… where I guess I'm not experiencing like severe levels of pain every single day and I can actually function like, go to school, walk, and my mental health is good too." (Lilac, cisgender female, age 18)*

On the other hand, many participants indicated that improving their psychosocial well-being, such as lowering stress and engaging in social activities, help with managing their pain intensity. For instance:

> *"I find that when I isolate myself… my mood goes down and then I don't have the energy to help to take care of myself, then my pain gets worse. So, it's like, it's all cogs in a machine. If I take care of me – like my mental health and like my emotions – I know I'll have the energy to take care of my body" (Turquoise, cisgender female, age 18)*

Taken together, these results highlight nuance in how adolescents conceptualized coping: though coping is often personal and requires active engagement, it does not always arise from deliberate decision-making. Meanwhile, adolescents view coping goals as relevant in their coping process, but these goals are often operating implicitly, and are only reflected on or recognized in hindsight. Importantly, the focus of coping with chronic pain for adolescents is not pain alone – it also includes managing one's functioning, which is often intertwined with managing their pain experience. Adolescents unanimously agree that coping does not often resolve the pain, but rather, results in a range of possible coping outcomes, which led to the generation of the second theme.

Theme 2: Coping Should Help But Doesn't Always. Participant definitions suggest that coping with chronic pain is about the ongoing effort to manage pain and/or maintain functioning, even if the outcomes are not positive. This idea was captured by the quotation: *"if we're coping, it should be helping, even though it doesn't all the time" (Blue, cisgender female, age 17)*. For many adolescents, their appraisals of the effectiveness of a coping strategy depends on its alignment of its coping outcomes with their conscious or unconscious coping goals. As such, rather than viewing coping as inherently good or bad, participants described a more nuanced understanding, recognizing that the same strategy could have both helpful and harmful effects depending on one's priorities and the situation. The following quotation demonstrates the complexity of evaluating the same coping strategy (i.e., stoicism) considering personal goals and situational factors:

> *"I think each one [strategy] has its strengths and weaknesses… For example, sometimes being stoic, it's kind of not helpful if, like, if you go to a doctor or like even on the bus. If I act like I'm not in pain, people are not gonna give me a seat in the bus. But if I do act like I'm in pain, or I'm wearing my braces so there's like visible signs that it's painful for me to do things, then it's a lot easier to get a seat. I think at a doctor's office, it's bad if you're too stoic, because they just won't really believe what you're saying. But, then…if you talk to your teachers, or to your peers, like you don't want people to think, that you're less capable of doing certain things… so it's always a balance." (Fuchsia, cisgender female, age 19)*

Another important consideration was the distinction between short- and long-term outcomes. Adolescents recognized that some coping strategies, like physiotherapy, may not provide immediate relief but could yield benefits over time. This awareness shaped how they defined successful coping as balancing feeling better in the moment and making choices that supported long-term well-being, even if those choices required short-term sacrifices:

"It's probably going to be a combination of positive and negative outcomes. I guess just like weighing it, like you know in terms of oh it's positive that I completed this task, but you know negative I'm more tired, and then I would usually, like…know which one's more important that I complete." (Chartreuse, cisgender female, age 19)

Adolescents identified a range of coping outcomes that can be drawn on as markers of successful and unsuccessful coping in the short- and long-term. These markers were often described in opposing terms (e.g., healthy vs. unhealthy), and informed decision-making about whether to continue, adapt, or abandon a coping response. As shown in Figure 2 ~~1~~, markers were positioned along a spectrum from positive to negative effects and included: (1) pain or symptom changes, (2) changes in functioning, (3) health implications, (4) attention given to pain, (5) variety in coping, and (6) effort and motivation. These markers are also described and demonstrated with example quotes in Table 2~~3~~. Importantly, participants varied in how they used these markers; some prioritized one or two markers as the main indicators of coping success, while others combined multiple markers when evaluating their coping. The number of different markers and variability their prioritization emphasize the complexity of the coping process.

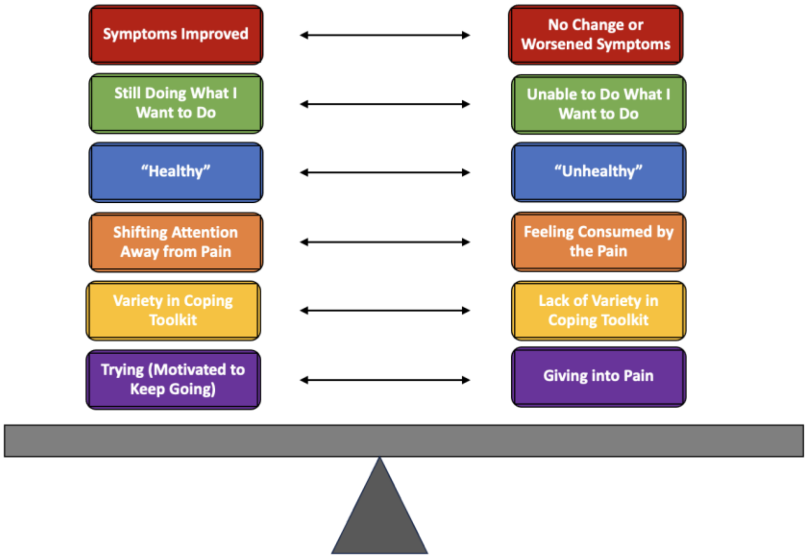

Figure 2~~1~~. Under the theme "Coping Should Help But Doesn't Always" (Part 1), adolescents identified markers of successful vs. unsuccessful coping, as summarized in Table 3. Participants described coping outcomes in opposing terms, such as healthy vs. unhealthy. Variability in coping outcomes with respect to each marker was characterized in relation to coping goals and consideration of short- and long-term consequences.

Markers	Description	Sample Quotes
1. Symptoms Improved vs. No Change or Worsening	A reduction in pain was identified as a marker of successful coping whereas worsening or no changes in pain was identified as a marker of unsuccessful coping.	*"Well, it (unsuccessful coping) is being in like more pain"* (Saffron, nonbinary, age 18)
2. Able vs. Unable to Do What I Want To Do	Successful coping was defined as the ability to continue working toward their goals and engaging in daily life, even in the presence of pain. Many adolescents rely on strategies that allow them to function at a level that felt normal for them.	*"I think successful coping is to well in essence be able to function at a somewhat normal level with my pain. Like realistically, it's not always the case but I think successful coping would be having strategies in place that I can rely on to [get] me at a normal functioning level for whatever I'm doing."* (Ivory, cisgender female, age 18)
3. Healthy vs. Unhealthy	Successful coping should be "healthy", meaning that coping responses are safe and sustainable. Many participants note that while some coping responses that feel helpful in the moment by, for example, allowing you to engage in activities you enjoy, if they cause long-term damage or suffering in mental, physical, and social domains, coping may still be regarded as unsuccessful. Some common markers of unhealthy coping efforts would be: neglecting self-care; burnout or exhaustion; avoidance; behaviours that damage to the body like overusing a body part, unhealthy diets, substance use, or self-harm; and causing stress to loved ones or damage to personal relationships.	*"Um, so like I struggled with like to self-harm as a coping strategy and like um, s-substance use. Um, and like the things that like made me feel bit better but weren't, like, just safe or healthy."* (Saffron, nonbinary, age 18) *"Anything that kind of avoids the major issue, and kind of like provides short-term benefits, like can be emotional coping of like stress eating for example or just over-eating that could be you know short-term coping where it makes you feel good in the moment but at the end of the day your underlining issues is always gonna come back to you. So, I think unsuccessful coping looks like that. For example, like how I was coping with my chronic pain by pushing myself too hard was unsuccessful because it didn't deal with it, and in fact made it worse. It made me feel good that I could stand sports, and I could continue doing the things that I love, but wouldn't last as long as I'd like it to because I ignored the chronic pain."* (Mauve, cisgender male, age 19).
4. Shifting Attention From vs. Toward Pain	Adolescents indicated that being able to shift their focus to things other than the pain is successful as it helps with relaxation and participation in other valued activities.	*"I can tell when it (is helpful) um, like it (the pain) is not the only thing that I can focus on. Because, usually, when it's bad, it's like the one thing that my brain's like really focusing on, it's just kinda the pain's like, there and I can't really focus on other things, so I know, that it helped when um, when I'm like I'm able to do other things and there's no really anything in the way, and then like my pain isn't in the way for me doing things in my life."* (Pewter, agender, age 14)
5. Variety vs. Lack Thereof	Another key aspect of successful coping was having a diverse ~~,~~ ~~reliable~~ toolkit of strategies and knowing when to use them. Practical, easy-to-implement strategies help manage pain, ~~effectively,~~ while learned techniques can become intuitive over time. ~~. In contrast,~~ A~~a~~ lack of variety in coping methods can leave individuals feeling stuck and unsupported when their limited strategies do not work for them.	*"I'd say you have a lot of different, like tools in your tool-kit…like in a pain toolkit, that kind of distracts you from the pain"* versus *"There is not a lot of different like tools that you can use, maybe you only have one and maybe it's not that helpful for you."* (Magenta, cisgender female, age 14)
6. Trying vs. Giving In	Adolescents emphasized the importance of motivation and effort in coping, viewing persistence as key to achieving personal goals despite chronic pain. Successful coping required consistency and active engagement, while giving up signaled withdrawal and a lack of effort, allowing pain to take over.	*"I think I would still consider it (coping) successful if I'm like trying. Um it's mainly just trying and wanting it, like if I didn't want it and I didn't care and I wasn't trying then I would have – I would never get to that success point, or like stability point, so I would still consider like me trying as successful."* (Lilac, cisgender female, age 18)

Table 2~~3~~. From Part 1 (Theme: Coping Should Help But Doesn’t Always): Descriptions and example quotations from participants to illustrate the markers of successful vs. unsuccessful coping as identified by adolescents when discussing their definitions of coping.

~~***Part 1 Discussion***~~

~~***Employing an inductive reflexive thematic analysis approach offers a novel, patient-centered exploration of coping, directly capturing adolescents' own definitions and perspectives. Our analysis generated two themes. Adolescents with chronic pain view coping as an active and personal process for managing their pain, maintaining functioning, or both (Theme 1: Dealing with "It" in a Way that Works for You) and emphasized that while coping is used with the intention of being helpful, it can lead to both positive and negative outcomes (Theme 2: Coping Should Help, But Doesn't Always). Adolescents unanimously agreed that coping does not resolve the pain condition; instead, its function is to help adolescents survive and even thrive with their chronic pain condition.***~~

~~***The active nature of coping refers to coping being an effortful, goal-directed process involving ongoing evaluation, learning, and adaptation. Even coping responses that are typically conceptualized as "passive", such as sleep or prayer, were reported being used in goal-directed ways to manage pain or support functioning. This element of the adolescents' definition highlights the self-directed nature of coping that has been described previously in research examining adolescents' experiences living with chronic pain (10). However, contrary to predominant theories within the pediatric chronic pain literature such as the control-based model of coping (6), adolescents did not equate coping being "active" with it being "intentional". Instead, adolescents with chronic pain unanimously acknowledged that using coping responses can be intentional (e.g., choosing to take a nap to reduce pain or recharge energy to complete a task), but often happens without conscious awareness of their goals in the moment (e.g., taking a nap because of pain and only later noticing reduced pain and improved energy levels). Often, such coping goals are recognized by adolescents in hindsight,***~~

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~~*suggesting that they may operate implicitly on their behaviour. However, when evaluating the effectiveness of a coping response, adolescents noted that it often depends on the alignment between coping goals and outcomes in each situation, which suggests that helping adolescents become more aware of these relationships may support more strategic coping.*~~

~~*The personal nature of coping reflects individual and situational variability. One aspect of personalization is the perceived target of coping (i.e., pain vs. functioning). Moreover, adolescents noted individual differences in their access to, preference for, and the effectiveness of specific coping responses across time and situations. Adolescents recognized that the same coping strategy might be helpful in one context but unhelpful in another or hold some combination of positive and negative effects. Coping outcomes were often judged based on how well they align with adolescents' priorities in each situation and their implications for short- versus long-term health and well-being.*~~

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~~*The conceptualization of coping within personal and situational contexts is well established. Lazarus and Folkman (1984), early pioneers in this area, introduced the dynamic nature of coping and emphasized the influence of individual (e.g., personality) and situational (e.g., setting, task demands) factors on coping responses and outcomes; however, discussions of coping within the pediatric chronic pain literature have typically failed to be consistent in this nuance (8). The finding that adolescents perceive coping as sensitive to person-environment interactions underscore the importance of further research into biological, psychological, and social factors that shape coping goals, responses, and outcomes. Moreover, these findings highlight limitations in attempts to categorize coping or identify stable group differences, as the range of coping responses are vast, and no single coping response may be inherently adaptive or maladaptive. The integrative model may offer a promising way forward*~~

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~~*by emphasizing flexibility and individual context, warranting its evaluation and refinement using the perspectives of adolescents with chronic pain.*~~

~~*Part 2: Adolescent Feedback on the Integrative Model of the Coping Process*~~

~~*Part two aimed to utilize adolescent feedback to assess the appropriateness and refine the integrative model as needed to better reflect the voices of adolescents with chronic pain.*~~

~~*Part 2 Methods*~~

~~Interview Questions~~

~~*Interview questions for Part 2 were analyzed separately. Part 2 engaged adolescents in reflecting on a process-oriented description of coping underlying the proposed integrative model. Adolescents were provided with the following verbal description of a simplified version of the integrative model along with a visual representation (Figure 2):*~~

~~*"Coping with chronic pain is sometimes described as a process involving three parts: coping goals, coping strategies, and coping outcomes. Coping goals are the reasons for using a coping strategy, such as to feel less pain or to improve our mood. Our coping goals influence our coping strategies, which are the actions we use to cope with our chronic pain experience. These can be mental strategies such as thinking positive thoughts or behaviors such as talking to someone, taking medications, or exercising. Coping outcomes are the consequences of using a particular coping strategy, such as feeling less pain or feeling more pain. Another example would be feeling less anxious or feeling more anxious. Coping outcomes may be different for different people or situations and can affect how we cope in the future."*~~

~~*To elicit feedback on the model, participants were asked: "What are your thoughts about this way of understanding coping?" Optional probes, such as "what parts of this*~~

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~~*description do(es) or do(es) not make sense to you?" or "what would you change or add?" were used as needed to facilitate elaboration.*~~

~~*Figure 2. A visual representation of the coping process presented to participants (Part 2)*~~

~~Data Analysis~~

~~*To describe adolescents' feedback on the integrative model, Elo and Kyngäs (2008)'s three-phase (preparation, organization, and reporting) qualitative content analysis was used. In contrast with quantitative content analysis, qualitative content analysis ensures that all feedback was captured, regardless of how frequently a particular point was mentioned. In addition, this approach was chosen for its flexibility and ability to systematically summarize direct and descriptive responses. Given that participants were asked specific questions about their feedback, their responses were closely tied to those prompts, requiring minimal interpretation. Accordingly, we adopted a realist epistemological stance, assuming participants' responses provide direct insight into their experiences.*~~

~~*The analysis was conducted by coding explicit, observable elements of the data using a combined deductive and inductive approach. Specifically, participant responses were first*~~

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~~*organized within a predefined framework (strengths, weaknesses, and suggested changes), and then inductively analyzed to identify meaningful categories that captured key aspects of their feedback. During the preparation phase, ANN familiarized themselves with the data by repeatedly reading the transcripts. In the organization phase, open coding was performed by making notes that guided the development of initial codes. These codes were then reviewed and refined by CMM, with ANN drafting preliminary descriptions for each. During the reporting phase, research team (ANN, CMM AJ, LC, and CM) collaboratively discussed and revised the codes and overarching categories as necessary to ensure accuracy and coherence in the write-up.*~~

~~Assessing Rigor in Qualitative Content Analysis~~

~~*Our approach to ensuring trustworthiness across all three stages of the qualitative content analysis adhered to an established checklist developed by Elo and colleagues (27). In the preparation phase, interview questions were developed with input from the research team and a patient partner and piloted with adolescents to ensure clarity and relevance. A semi-structured interview format with primary and probing questions was adopted to allow inductive responses while minimizing interviewer influence. ANN also engaged in reflexive journaling to maintain awareness of their role in shaping interactions. To strengthen dependability, adolescents were purposively sampled across gender, ethnic, and socioeconomic contexts to capture diverse perspectives.*~~

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~~*In the organization phase, transparency was maintained by documenting the development and refinement of categories. Congruent with good practice, a single coder approach was used, yet familiarization, open coding with audit trails, and collaborative discussions among the patient partner and research team with discrepancies resolved by*~~

~~*consensus were used to ensure categories accurately reflected the data, enhancing credibility and confirmability.*~~

~~*In the reporting phase, findings were presented systematically, first within the framework of strengths, weaknesses, and suggested changes, and then refined into categories. Connections between data and interpretations were demonstrated in a table with representative quotations, ensuring participants' voices were evident. Categories were distinct and comprehensive, capturing all participant ideas regardless of frequency. Overall, results are conveyed with clarity, scientific rigor, and a full account of the analytic process to support trustworthiness.*~~

~~*Part 2 Results*~~*Adolescent Feedback on the Proposed Model*

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The results of adolescents' feedback on the~~a~~ proposed framework for conceptualizing coping were summarized and reported using qualitative content analysis. The demographics of participants for Part 2 were identical to those of Part 1. A description of categories, codes, and corresponding quotations are presented in Table 3~~4~~. In general, all adolescents indicated that the presented integrative definition "makes sense" and provided examples applying components of this definition to their own lives. Their specific feedback on the strengths, weaknesses, and opportunities for improving the framework were organized into three overarching categories: (1) Clarity and Accessibility, (2) Alignment with Lived Experience and Existing Knowledge, and (3) Promoting Intentionality.

Category	Codes	Sample Quotations
Clarity and Accessibility	*Strengths*	1. "I like that. I think it's good. Um, it kind of just really sets the image of like—and makes it easier to understand." (Lilac, cisgender female, age 18)
		2. "I think it's logical, and it's, reasonable to help, create a process, that can be followed and monitored." (Periwinkle, non-binary, age 19)
		3. "If you're just starting your journey with dealing with chronic pain, you need to be able to understand these three [coping goals, coping strategies, coping outcomes], and be able to learn to start incorporating them." (Marigold, cisgender female, age 17)
		4. "I would say it's a really good way to try and think about it, and I think the simplicity of it is very helpful to like, try and establish this system. If you're explaining coping to someone who's new to chronic pain or trying to deal with their chronic pain, then I think this would be a really good system to instill." (Amber, cisgender female, age 18)
	Weakness/Suggested Improvements	5. "When I first saw the word consequences, like negative is what I thought in my head immediately- […] I don't think of like the consequence of feeling better, I think about like the consequence of like negative things-. Instead of like the positives." (Ivory, cisgender female, age 18)
		6. "I might use pictures and colours. And I might define coping in it. It feels really broken up, like I get that's it's supposed to define coping, but it's really broken up, maybe put it in a circle." (Indigo, cisgender female, age 18)
Alignment with Lived Experience and Existing Knowledge	*Strengths*	7. "I feel like any detail I can think of is able to kind of fit into one of these- into kinda like this timeline so it does make sense to me." (Fuchsia, cisgender female, age 19)
		8. "I mean it makes sense…It's kind of like um, the like CBT method of the thinking right, like the thought affects the feeling affects the action." (Saffron, agender, age 18)
	Weakness/Suggested Improvements	9. "This is a good way to think about it in abstract, but I don't think, that when you're actually dealing with it, this is what you're thinking about […] I think… that, a lot of people already get this about coping almost intrinsically… cuz, it is something that you just kind of do." (Sepia, gender fluid, age 18)
		10. "Sometimes like, personally I would probably do a coping strategy first, and then think about what I've just done." (Teal, cisgender male, age 19)
		11. "There are different aspects of my pain and my health in general […] I found that, before I could go onto the coping strategies that help my pain, I had to start with the coping strategies that helped with the trauma." (Coral, cisgender female, age 15)
		12. I think it's too hard to put everything in your life as a goal, or a strategy, right, like I think- and like even like coping outcomes sometimes things just happen…I wouldn't wanna frame like an allergic reaction to a pain drug as a coping outcome […] Also, like it- it's-like, it's not necessarily from like a patient perspective I think it's more from a clinical perspective. […] Well, it makes sense it's just like not in my own words or necessarily the words of like, other people I've talked to with chronic pain, it's very like clinical" (Indigo, Cisgender Female, age 18)
Promoting Intentionality	*Strengths*	13. "Like if you have like a bad outcome, it's sorta gives you knowledge that, "ok maybe this direction isn't great, it's not super helpful, and it doesn't make me feel good." You also know that you tried it and it's okay that it didn't work…if it's good, then you might stick with it, and then see results over a longer period of time." (Indigo, cisgender female, age 18)
		14. "I probably would be able to deal with it…when I do it in like a goal sort of way like- like am I gonna ignore the pain, am I tryna alleviate it…its like probably a better way to approach it." (Chartreuse, cisgender female, age 19)
	Weakness/Suggested Improvements	15. "I feel like if I were to really put a lot of thought and a lot of effort into, you know, 'this is the goal of why I'm doing this strategy and this is the outcome that I want, this is the outcome that I'm having?' would probably have more of a negative impact on me now, because, I feel like I would just enjoy doing it less." (Amber, cisgender female, age 18)

Table 34. From Part 2: Selected quotations to illustrate adolescent feedback on the proposed integrative model of coping, highlighting its strengths, weakness, and areas for improvement based on their experiences living with chronic pain.

Category 1: Clarity and Accessibility.

Most adolescents described the model’s definition of the coping process as brief, straightforward, and easy-to-understand (Table 3~~4~~, Quotation 1). ~~Participants~~ They highlighted that the model provided a clear and structured way to conceptualize coping, ~~laying a strong foundation for~~which is helpful for applying and monitoring coping strategies effectively (Table 3~~4~~, Quotes 2-4). Participants noted that simplicity and structure of the model is ~~especially~~ beneficial for those in the early stages of learning to cope with chronic pain (Table 3~~4~~, Quotation 4).

Despite the model’s strengths, adolescents identified areas for improving clarity and accessibility. The most common concern was the term "consequences," which they felt had a predominantly negative connotation (Table 3~~4~~, Quotation 5). They suggested that clarifying that coping strategies could lead to both positive and negative effects would create a more balanced perspective. It was also recommended that incorporating visual elements would enhance accessibility, with a specific suggestion to use a circular representation rather than a linear one to better reflect the ongoing nature of coping (Table 3~~4~~, Quotation 6). In addition, while specific elements of the coping process were defined, participants noted that the model did not explicitly define "coping" itself, which they believed would improve overall clarity and comprehension.

Category 2: Alignment with Lived Experience and Existing Knowledge.

Another reason adolescents provided for why this model “makes sense” was because they could make connections with either their own personal experiences (Table 3~~4~~, Quotation 7) or other psychological theories that they are already familiar with, such as the cognitive-behavioral therapy model (Table 3~~4~~, Quotation 8). However, many adolescents identified certain aspects of

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Formatted: Font: (Default) Times New Roman coping that they felt could be better captured by the integrative model. The most common suggestion was to adjust the definition to account for the automatic nature of coping. One adolescent elaborated on this by describing coping as being located "intrinsically," suggesting that while the model is appropriate, it should acknowledge that coping is not always intentional (Table 3~~4~~, Quotation 9). Correspondingly, another recommendation was to allow coping to start at different points in the process, such as beginning with coping strategies rather than always starting with a predefined goal (Table 3~~4~~, Quotation 10).

Lastly, while the simplicity of the model was seen as beneficial for understanding coping, many adolescents felt that it failed to capture the true complexity of the process (Table 3~~4~~, Quotation 11). Some participants highlighted that coping with chronic pain often involves managing other stressors simultaneously, meaning that coping is influenced by multiple interacting factors. Another suggestion was to reconsider how experiences are categorized within the model. For example, one adolescent expressed concern that an allergic reaction to a medication should not be considered a coping outcome but rather a factor that limits the effectiveness of that medication. Additionally, one adolescent criticized the model for using “clinical” language (e.g., “consequences”, “mental and physical actions”) to describe coping instead of the words used by people with chronic pain (Table 3~~4~~, Quotation 12). Making the model more flexible and incorporating more patient-centered language were suggested to improve its application.

Category 3: Promoting Intentionality.

Many~~y~~ adolescents found the model helpful in bringing awareness to possible goals, such as reducing pain or improving mental health, and how to select coping strategies and evaluate

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Formatted: Font: (Default) Times New Roman coping outcomes accordingly. Several participants highlighted the importance of trial and error in this process, noting that experimenting with different strategies allowed them to determine what worked best for them. They emphasized that both positive and negative experiences served as valuable learning opportunities, ultimately refining their coping process, and creating a sense of direction over time (Table 33~~4~~, Quotes 13 and 14). As such, a model conceptualizing the coping process serves to promote individualized coping plans. One participant noted a drawback to increased intentionality, explaining that over-analyzing coping strategies can make the process feel rigid and unenjoyable (Table 3~~4~~, Quotation 15). While setting goals early in chronic pain management helps identify effective strategies, relying on goal-oriented coping long-term may become too effortful, potentially reducing motivation and well-being. This suggests that a flexible approach, balancing goal setting with intrinsic enjoyment, may be key to sustaining effective coping strategies.

~~Part 2 Discussion~~

~~Part 1 Discussion~~

~~Employing an inductive reflexive thematic analysis approach offers a novel, patient-centered exploration of coping, directly capturing adolescents' own definitions and perspectives. Our analysis generated two themes. Adolescents with chronic pain view coping as an *active* and *personal* process for managing their pain, maintaining functioning, or both (Theme 1: Dealing with "It" in a Way that Works for You) and emphasized that while coping is used with the intention of being helpful, it can lead to both positive and negative outcomes (Theme 2: Coping Should Help, But Doesn't Always). Adolescents unanimously agreed that coping does not resolve the pain condition; instead, its function is to help adolescents survive and even thrive with their chronic pain condition.~~

~~The *active* nature of coping refers to coping being an effortful, goal-directed process involving ongoing evaluation, learning, and adaptation. Even coping responses that are typically conceptualized as “passive”, such as sleep or prayer, were reported being used in goal-directed ways to manage pain or support functioning. This element of the adolescents’ definition highlights the self-directed nature of coping that has been described previously in research examining adolescents’ experiences living with chronic pain~~ (18)~~. However, contrary to predominant theories within the pediatric chronic pain literature such as the control-based model of coping (6), adolescents did not equate coping being “active” with it being “intentional”. Instead, adolescents with chronic pain unanimously acknowledged that using coping responses can be intentional (e.g., choosing to take a nap to reduce pain or recharge energy to complete a task), but often happens without conscious awareness of their goals in the moment (e.g., taking a nap because of pain and only later noticing reduced pain and improved energy levels). Often, such coping goals are recognized by adolescents in hindsight, suggesting that they may operate implicitly on their behaviour. However, when evaluating the effectiveness of a coping response, adolescents noted that it often depends on the alignment between coping goals and outcomes in each situation, which suggests that helping adolescents become more aware of these relationships may support more strategic coping.~~

~~The *personal* nature of coping reflects individual and situational variability. One aspect of personalization is the perceived target of coping (i.e., pain vs. functioning). Moreover, adolescents noted individual differences in their access to, preference for, and the effectiveness of specific coping responses across time and situations. Adolescents recognized that the same coping strategy might be helpful in one context but unhelpful in another or hold some combination of positive and negative effects. Coping outcomes were often judged based on how~~

~~well they align with adolescents' priorities in each situation and their implications for short- versus long-term health and well-being.~~

~~The conceptualization of coping within personal and situational contexts is well established. Lazarus and Folkman (1984), early pioneers in this area, introduced the dynamic nature of coping and emphasized the influence of individual (e.g., personality) and situational (e.g., setting, task demands) factors on coping responses and outcomes; however, discussions of coping within the pediatric chronic pain literature have typically failed to be consistent in this nuance (12). The finding that adolescents perceive coping as sensitive to person–environment interactions underscore the importance of further research into biological, psychological, and social factors that shape coping goals, responses, and outcomes. Moreover, these findings highlight limitations in attempts to categorize coping or identify stable group differences, as the range of coping responses are vast, and no single coping response may be inherently adaptive or maladaptive. The integrative model may offer a promising way forward by emphasizing flexibility and individual context, warranting its evaluation and refinement using the perspectives of adolescents with chronic pain.Further insights into how adolescents understand coping in the context of their chronic pain and the utility of the integrative model were gleaned from their feedback on the proposed model, which was analyzed using qualitative content analysis. Adolescents responded positively to the model's breakdown of coping into its component parts (i.e., goals, responses, and outcomes) and its depiction of coping as a process. They found this structure easy to understand (Category 1: Clarity and Accessibility) and described it as resonating with their lived experiences and existing models they were familiar with, such as cognitive-behavioural therapy framework (Category 2: Alignment with Lived Experiences and Existing Knowledge). Importantly, adolescents recognized that the framework emphasized the~~

~~value of intentional coping, which they believed could support the development of strategies tailored to their individual preferences and situational needs (Category 3: Promoting Intentionality). Through trial and error, adolescents described learning to cope with their pain. As such, a process-oriented model may help to advance interventions by supporting adolescents in becoming aware of their coping goals and processing past coping outcomes as valuable learning opportunities to refine how they cope.~~

~~Adolescents' constructive feedback revealed that it is important for the model to be explained using relatable language and with visual representations. In addition, while adolescents saw value in how the proposed model could support intentional coping, they noted that they are unlikely to think about their coping in such a structured way in moments of high pain or stress. Adolescents with chronic pain also noted that instinctive or unconscious coping is not only more common and realistic, but often preferred because it is faster and less effortful, leading to feelings of productivity and/or enjoyment when coping. Therefore, adaptations to this model should include highlighting both intentional and unintentional ways of coping. Future applications may include supporting adolescents in creating proactive individualized coping plans and refining those plans through reflection on past experiences instead of expecting adolescents to cope using this framework in moments of elevated pain or stressful situations related to their pain condition. Over time, helpful coping processes could become more automatic and intuitive with practice, reducing the need for constant reflection.~~

~~General~~ Discussion

~~Coping is critical to chronic pain management (5). Although it is widely recognized as a complex and multifaceted construct, current conceptualizations within pediatric chronic pain typically focus on predefined coping responses which overlook the nuanced and evolving ways~~

~~in which adolescents understand and practice coping in their everyday lives. This disconnect limits the utility of existing coping assessment tools and reduces the effectiveness of interventions intended to support adolescents living with chronic pain (12).~~ This study aimed to ~~bridge the gap between theory and lived experience~~understand how ~~by asking~~ adolescents define ~~to define~~ coping in the context of chronic pain and ~~share~~ their opinions of a proposed framework (i.e., the integrative model) to advance patient-centered research and clinical practice. ~~The results show~~ Results indicate

~~These study results demonstrated that~~ adolescents view coping as critical in their pain journey ~~with pain~~ and they see merit in the integrative model for understanding their experiences ~~coping with chronic pain~~. ~~and resonate with operationalizing coping into goals, responses, and outcomes. Adolescents share a view of~~Their personal definitions emphasize ~~coping as an~~ active and personal processes in coping. They suggest coping ~~that~~ is not about eliminating pain but about finding ways to navigate life with pain while understanding that these efforts may not always succeed~~, depending on the circumstances~~.

The *active* nature of coping refers to an effortful, goal-directed process involving ongoing evaluation, learning, and adaptation, aligned with previous research (18). Coping responses typically conceptualized as "passive", such as sleep or prayer, were reported being used in goal-directed ways to manage pain or support functioning. However, contrary to predominant theories within the pediatric chronic pain literature such as the control-based model of coping (6), adolescents did not equate coping being "active" with it being "intentional". Instead, participating adolescents ~~with chronic pain~~ unanimously acknowledged that using coping responses can be intentional (e.g., choosing to take a nap to reduce pain or recharge energy to complete a task), but often happens without conscious awareness of their goals in the moment (e.g., taking a nap because of pain and only later noticing reduced pain and improved energy levels). Often, coping goals operate implicitly on behaviour and are recognized by adolescents in hindsight. However, adolescents noted that the effectiveness of coping responses depends on the alignment between ~~coping~~ goals and outcomes, suggesting that helping ~~adolescents~~them become more aware of these relationships may support more strategic coping.

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The *personal* nature of coping reflects individual and situational variability. Adolescents noted differences in their coping goals (i.e., pain vs. functioning), access to and preference for coping responses, and coping outcomes across time and situations. Adolescents recognized that many coping responses hold some combination of positive and negative effects in the short- and long-term. Pioneers Lazarus and Folkman (1984), ~~early pioneers in this area,~~ introduced the dynamic nature of coping and emphasized the influence of individual (e.g., personality) and situational (e.g., setting, task demands) factors on coping responses and outcomes; however, discussions of coping within the pediatric chronic pain literature have typically failed to be consistent in this nuance (12). The integrative model may offer a promising way forward by emphasizing flexibility and individual context, warranting its evaluation and refinement using the perspectives of adolescents with chronic pain.

The results from the qualitative content analysis provide insights into the utility of the integrative model, with adolescents responding positively to its breakdown of coping into component parts (~~i.e.,~~ goals, responses, ~~and~~ outcomes) and ~~its~~ depiction of coping as a process. They found this structure easy to understand and relatable. Importantly, adolescents recognized that the framework emphasized intentional coping, which they believed could support the development of strategies tailored to ~~their~~ individual preferences and situational needs. Through trial and error, adolescents described learning to cope with their pain, suggesting that a process-oriented model may help advance interventions by supporting awareness of coping goals and encouraging reflection on past outcomes as learning opportunities to refine coping strategies. ~~At the same time, a~~Adolescents’ constructive feedback highlighted the importance of explaining the model using ~~relatable~~accessible language and visual representations. They also noted that, although the structured approach to coping was valuable, they are unlikely to engage in such deliberate processing during moments of high pain or stress. Instinctive or unconscious coping is more common, realistic, and often preferred by adolescents due to its efficiency and reduced effort, as well as its association with feelings of productivity or enjoyment. ~~Adolescents also noted that coping tends to be goal-directed even if they are not always aware of their goals in the moment. While adolescent strive for greater ease and enjoyment in coping – marked by increased automaticity – they acknowledged that being aware their coping goals as well as balancing short-term and long-term benefits are critical to successful coping. This highlights an avenue for the integrative model to serve as a tool for increasing awareness and guiding individualized coping plans that may translate into more effortless and sustainable coping habits over time.~~

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An Adapted Definition and Model for Coping in the Context of Pediatric Chronic Pain

Based on adolescent definitions and feedback on the proposed integrative model of the coping process, we propose the following definitions of coping and corresponding visual representation depicted in Figures 3 and 4~~3~~:

> *Coping in the context of chronic pain is an active and personal process that involves consciously or unconsciously using thoughts or behaviors to deal with the physical sensations and/or everyday challenges that come with having chronic pain. Coping is not about curing or eliminating chronic pain; rather, it is intended but not guaranteed to*

help you get through the day and possibly even thrive despite having pain. Coping looks different for every person and situation but always involves having one or more coping goals (whether aware of it in the moment or not), using one or more coping responses (thoughts or behaviors), and experiencing one or more coping outcomes (e.g., changes in pain, emotional experience, and/or functioning). Coping outcomes can make one feel better, worse, or somewhere in between, depending on how well they fit with their coping goal(s) and support their well-being in the short- and long-term.~~m~~

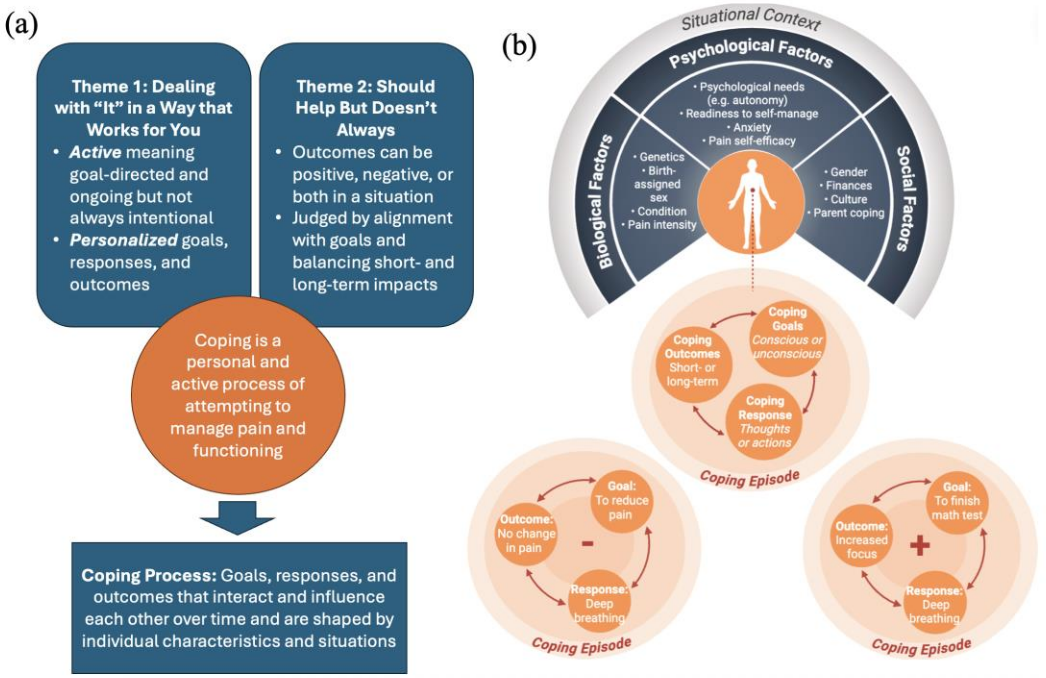

Figure 3. (a) Summary of themes from reflexive thematic analysis informing the definition of coping and highlighting adolescents' agreement with its operationalization as a process. (b)

Visual representation of the coping process, adapted from the integrative model (15) and refined with adolescent feedback. An example illustrating effective (+) and ineffective (+) coping attempts using the same coping response based on different coping goals.

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Figure 3(a) provides a summary of themes produced from reflexive thematic analysis that were used to formulate the above definition and a key takeaway from the qualitative content analysis that adolescents agreed with the operationalization of coping as a process. Figure 3 (b) is a visual representation of the coping process that reflects an adaptation of the integrative model (14) through integrating insights and feedback from adolescents in this study. ~~Figure 3 (c) provides~~The figure also provides an example of potential appraisals of effective and ineffective coping attempts using the same coping responses, denoted by a "+" and "-" symbol, respectively. These appraisals are determined by the alignment between coping goals and outcomes within a given context. Adolescents agreed that greater alignment increases the likelihood of reusing that coping response in the future. ~~Some~~ One adaptation~~s~~ they recommended included specifying that coping outcomes vary ~~in terms of intentionally and coping outcomes vary~~ in terms of how helpful it is in the short and long-term. Another primary suggested change ~~in the model constitutes~~ was the ~~suggested~~ circular as opposed to linear representation of the coping process to allow flexibility in processing coping episodes by beginning at any point in the process instead of coping goals. For example, an adolescent may be able to first identify their coping response before gaining insight into underlying coping goals present in that moment. This change aligns with adolescent perceptions that coping can occur with or without conscious awareness. Another recommendation was to include factors in the model that influence people's coping goals, responses, and outcomes. The factors included at this stage reflect some of those highlighted as important in the literature and currently reflected in the integrative model (14); as part of the larger research program, we are investigating which ~~biological, psychological, social,~~social identity and situational factors are deemed important by adolescents with chronic pain themselves.

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Strengths, Limitations, and Future Directions

This paper is the first to qualitatively explore how adolescents with chronic pain define coping, which is critical to evaluating and adapting current theoretical frameworks for coping in pediatric chronic pain contexts. ~~Research implications include improving the validity of measures and our ability to interpret and consolidate research findings; clinical implications include ensuring assessments and interventions for pain coping are appropriate, understandable, and useful to patient populations.~~ Qualitative research is ~~particularly well-suited for~~ recommended for theory application, testing, and refinement when researchers integrate both deductive and inductive approaches because it allows for supporting, contradicting, refining, and expanding evidence for a theory or conceptual model, ultimately building upon existing knowledge instead of ~~instead of~~ contributing to further confusion or fragmentation ~~in the literature~~ (39). In addition, ~~the~~ inclusion of patient perspectives into the definition of coping in the context of chronic pain is critical for adapting assessments and interventions to be more developmentally and contextually relevant.

Another notable strength of this research was its inclusion of participants from diverse ethnic, socioeconomic, geographic, and gender backgrounds, as well as a range of chronic pain conditions, an approach that enriches the understanding of coping across varied perspectives. Moreover, limiting the sample to adolescents aged 14–19 enabled a more focused examination of this specific developmental period. Accordingly, the proposed definition and model adaptations are well-positioned to capture the perspectives of adolescents navigating chronic pain within varied sociocultural contexts.

This study is, however, not without limitations. While the study's sample size is appropriate for qualitative research (31–33) and has diverse representation, the insights drawn are representative of a small group of adolescents with chronic pain ~~and~~who were ~~consists of~~ predominantly White, cis-gender females. Adolescents who participated in this research represent those who have access to technology for online participation and who were motivated to share their perspectives. In addition, all adolescents in this sample had received some form of pain focused treatment, with the majority (62%) engaging in psychological interventions. These experiences likely influenced their perceptions of coping, aligning them more closely with clinical perspectives. Future research is needed to continue to test and refine the proposed definitions across more diverse clinical and nonclinical populations of youth with chronic pain. While steps were taken to mitigate confirmation bias, including ongoing consultation with a patient partner and collaborators, future research should continue to explore the relevance and applicability of the model across diverse patient experiences.

Conclusion and Clinical Implications

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The results of this study suggest that adolescents' perspectives on coping with chronic pain align with the flexible, process-oriented conceptualization offered by the integrative model. Adolescents perceive coping as always active and personal, but can vary in terms of how intentional and helpful it can feel. Through incorporating adolescent perspectives into the model, this study offers conceptual clarity and language to align the perspectives of adolescents living with chronic pain with other stakeholders' perspectives (e.g., researchers, clinicians, caregivers). Based on these insights, it is critical that research and clinical discussions shift from prescribing "correct" strategies toward collaboratively exploring coping in patient-centered, goal-oriented ways. Specifically, researchers and clinicians may want to avoid relying solely on questionnaires or framing coping responses as either “adaptive” or “maladaptive” without having discussions with youth to capture their personal goals and appraisals as well as information about situational factors impacting their coping. Research implications include improving the validity of measures and our ability to interpret and consolidate research findings. Within clinical contexts, the integrative model may help to provide psychoeducation that increases patients’ self-awareness and offers validation of how coping with chronic pain is complex and challenging. Healthcare providers guided by this model may consider a nonjudgmental, open stance focused on understanding the patient’s goals and factors shaping their coping preferences and outcomes thereby facilitating individualized coping plans that when practiced may translate into more effortless and sustainable coping habits over time.

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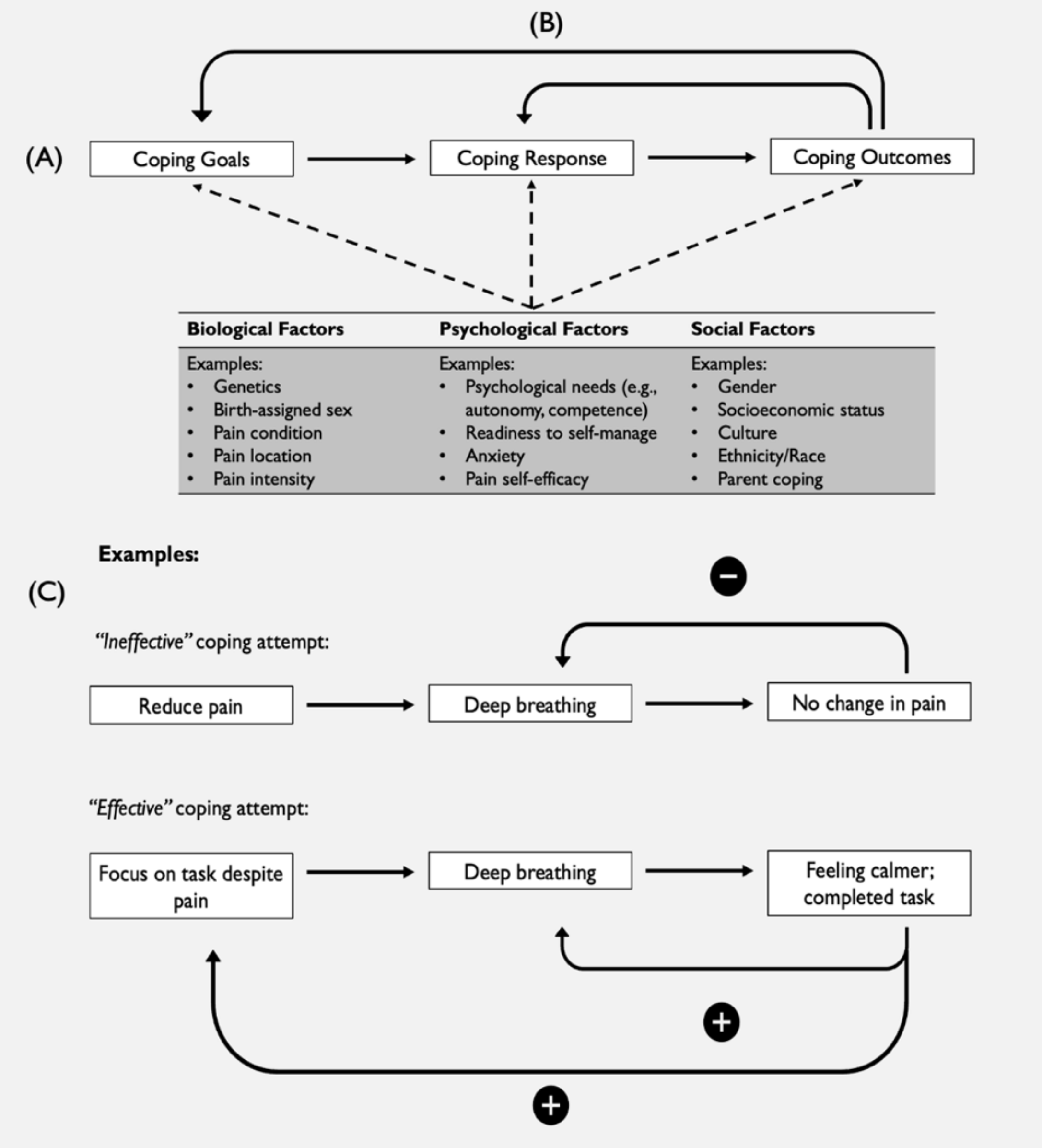
Supplemental Materials

Supplemental Figure 1. The integrative model of the coping process. (A) An attempt is made up of goals, responses, and outcomes impacted by numerous factors. (B) Appraisals of outcomes decrease or promote future goals and responses. (C) Examples of coping attempts using this model. For future attempts, "-" denotes a potential decrease and "+" denotes a potential promotion.



Note. From "Proposing an integrative model of the coping process: The importance of a person-centered, context-sensitive, and flexible approach for understanding coping with pediatric chronic pain" by Nabbijohn & McMurtry, 2024, *Pediatric Pain Letters*, *26* (2), p. 9-13. Copyright 2024 by A. N. Nabbijohn & C. M. McMurtry

Supplemental Table 1. Authors' positionality statements.

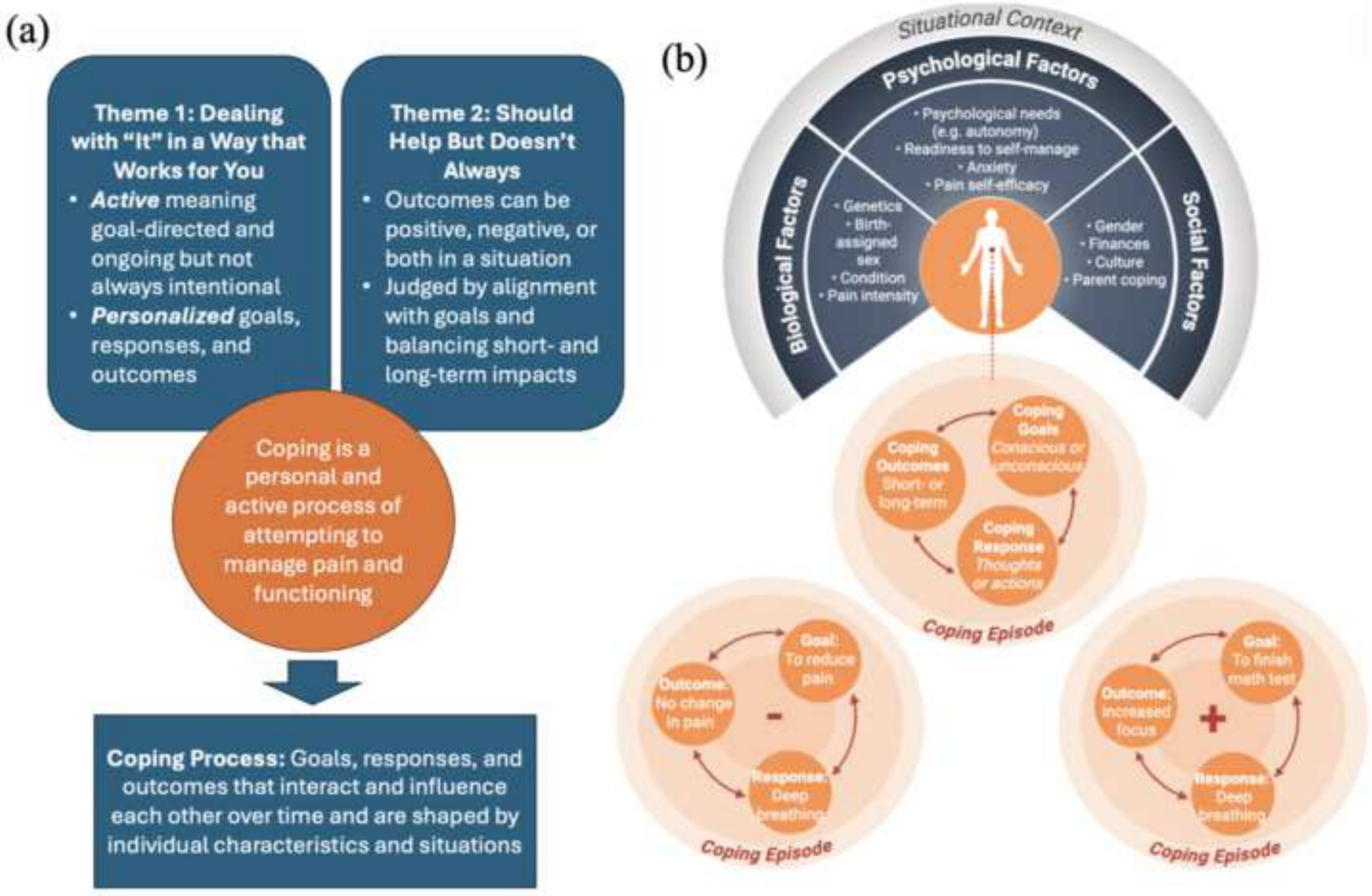
Author	Positionality Statement
A. Natisha Nabbijohn	ANN is a first-generation Canadian, with a Guyanese background, and a cis-gender woman training in child and adolescent clinical psychology. She currently holds a BSc and MA in Clinical Psychology and is working towards completing her PhD. She has a background in science (i.e., biology and psychology) and her current work center on promoting the well-being of youth living with chronic pain, with a specific interest in pediatric pain coping. While ANN is well-versed with the empirical and theoretical literature on coping and chronic pain and have witnessed the journey of family and friends with chronic pain, she is not a person with chronic pain. As the primary researcher, ANN acknowledges that without personal experiences with chronic pain, her engagement with and interpretation of the data is likely be shaped by clinical and research experience.
Dr. C. M. McMurtry	CMM is a white, third-generation Canadian, cis-gendered woman. She is an active researcher and clinician in pediatric (acute and chronic) pain, trained in clinical and health psychology. She has a personal history of recurrent pain now resolved.
Dr. Line Caes	LC identifies as a white, cisgendered woman residing in the United Kingdom. She is an active researcher in pediatric pain, trained in clinical and health psychology. Her research interests cover the social aspects of pediatric pain experiences, with a particular interest on the evolving parent-child interactions during painful experiences across the child's development. She has no personal experiences with chronic pain.
Dr. Abbie Jordan	AJ is white cis-gendered British woman who has a longstanding interest in studying pediatric chronic pain. She is particularly interested in learning about the experiences of adolescents with lived experience of chronic pain. AJ is herself a parent of adolescents, none of whom have experience of chronic pain. AJ is a health psychologist by discipline and typically adopts a big Q (Qualitative) approach to her work in the pediatric chronic pain field.
Ciara Mahaffy (patient partner)	CM has lived with Juvenile Idiopathic Arthritis Polyarticular RF negative subtype since she was a child. This rheumatic disease has given her chronic pain that she lives with every day. Throughout CM's assistance with this study, she was between the ages of 19 and 22. She is now a postgraduate student studying English Literature.

Note. Authors have chosen to share how their experiences have contributed to their interpretations regarding the present research.

Supplemental Table 2. Elo and Kyngäs's three-phase checklist for qualitative content analysis and how it was applied for the current study to understand adolescent perspectives on the proposed conceptualization guided by the integrative model.

Phase of the Content Analysis	Questions to Check	The Current Study
Preparation Phase	**Data collection method** How do I collect the most suitable data for my content analysis? Is this method the best available to answer the target research question? Should I use either descriptive or semi-structured questions? Self-awareness: what are my skills as a researcher? How do I pre-test my data collection method?	Interview questions were developed with input from the research team and a patient partner and piloted with adolescents to ensure clarity and relevance. A semi-structured interview format with primary and probing questions was used. Reflexive journaling supported researcher self-awareness.
	Sampling strategy What is the best sampling method for my study? Who are the best informants for my study? What criteria should be used to select the participants? Is my sample appropriate? Is my data well saturated?	Adolescents were purposively sampled across gender, ethnic, and socioeconomic contexts. The sample captured a range of perspectives across key demographic variables to ensure conclusions drawn appropriate and rich.
	Selecting the unit of analysis What is the unit of analysis? Is the unit of analysis too narrow or too broad?	Individual interview responses were used as the unit of analysis. Analysis of each interview allowed for depth but drawing from across participant experiences enabled breadth.
Organization Phase	**Categorization and abstraction** How should the concepts or categories be created? Is there still too many concepts? Is there any overlap between categories?	Categories were developed inductively through open coding and iterative refinement with audit trials. Categories were refined through team discussion to ensure conceptual clarity and parsimony; discrepancies were discussed and resolved by consensus to minimize overlap.

	Interpretation What is the degree of interpretation in the analysis? How do I ensure that the data accurately represent the information that the participants provided?	Open coding, audit trails, and consensus discussions ensured alignment with participant data. Categories of "strengths", "weaknesses/suggested improvements" was used to organize and interpret participant responses.
	Representativeness How do I check the trustworthiness of the analysis process? How do I check the representativeness of the data as a whole?	Trustworthiness was enhanced through transparency, audit trails, and collaborative validation. Diverse sampling ensured broad representation.
Reporting Phase	**Reporting results** Are the results reported systematically and logically? How are connections between the data and results reported? Is the content and structure of concepts presented in a clear and understandable way? Can the reader evaluate the transferability of the results (are the data, sampling method, and participants described in a detailed manner)? Are quotations used systematically? How well do the categories cover the data? Are there similarities within and differences between categories? Is scientific language used to convey the results?	Findings were presented systematically within strengths, weaknesses/suggested changes, then refined into categories. A table with representative quotations demonstrated links between data and interpretations. Categories were distinct/non-overlapping and comprehensive, capturing all participant ideas regardless of frequency. Representative quotations were included to reflect participants' voices.
	Reporting analysis process Is there a full description of the analysis process? Is the trustworthiness of the content analysis discussed based on some criteria?	The analytic process was described in detail, including coding and category development. Trustworthiness was explicitly addressed using established criteria and checklist guidance.



Theme 1: Dealing with "It" in a Way that Works for You

- ***Active*** meaning goal-directed and ongoing but not always intentional
- ***Personalized*** goals, responses, and outcomes

Theme 2: Should Help But Doesn't Always

- Outcomes can be positive, negative, or both in a situation
- Judged by alignment with goals and balancing short- and long-term impacts

Coping is a personal and active process of attempting to manage pain and functioning

Coping Process: Goals, responses, and outcomes that interact and influence each other over time and are shaped by individual characteristics and situations

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	8
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	12 (Table 1)
Occupation	3	What was their occupation at the time of the study?	12 (Table 1)
Gender	4	Was the researcher male or female?	12 (Table 1)
Experience and training	5	What experience or training did the researcher have?	12 (Table 1)
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	8
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	8
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	N/A
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	9-11, 26-29
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	6
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	6, 8
Sample size	12	How many participants were in the study?	13
Non-participation	13	How many people refused to participate or dropped out? Reasons?	13
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	7-8
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	8
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	13; (Table 2)
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	7, 9, 26
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	N/A
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	8
Field notes	20	Were field notes made during and/or after the inter view or focus group?	8
Duration	21	What was the duration of the inter views or focus group?	7,8
Data saturation	22	Was data saturation discussed?	N/A
Transcripts returned	23	Were transcripts returned to participants for comment and/or	N/A

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	8
Description of the coding tree	25	Did authors provide a description of the coding tree?	See Figure 3
Derivation of themes	26	Were themes identified in advance or derived from the data?	10, 11, 27
Software	27	What software, if applicable, was used to manage the data?	8
Participant checking	28	Did participants provide feedback on the findings?	N/A
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	15-23, 30
Data and findings consistent	30	Was there consistency between the data presented and the findings?	15-24
Clarity of major themes	31	Were major themes clearly presented in the findings?	15-24
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	N/A

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.