



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(11): 2565-2570
© 2022 TPI
www.thepharmajournal.com
Received: 07-09-2022
Accepted: 11-10-2022

YD Haritha

Department of Human
Development and Family
Studies, College of Community
Science, Acharya N. G. Ranga
Agricultural University, Guntur,
Andhra Pradesh, India

Dr. Bilquis

Department of Human
Development and Family
Studies, College of Community
science, Acharya N. G. Ranga
Agricultural University, Guntur,
Andhra Pradesh, India

Positive youth development: Study on personality of adolescents

YD Haritha and Dr. Bilquis

Abstract

Positive youth development means Positive Experiences + Positive Relationships + Positive Environments = Positive Youth Development. Positive developmental settings and characteristics of successful positive youth development members can be used for training staff, designing programs, and developing standards and assessment tools: Physical and Psychological Safety – Safe and health-promoting facilities; practice that increases safe peer group interaction and decreases unsafe or confrontational peer interactions. Appropriate Structure – Limit setting, clear and consistent rules and expectations, firm enough control, continuity and predictability, clear boundaries, and age-appropriate monitoring. Supportive Relationships – Warmth, closeness, connectedness, good communication, caring, support, guidance, secure attachment, responsiveness. Opportunities to Belong – Opportunities for meaningful inclusion, regardless of one's gender, ethnicity, sexual orientation or disabilities; social inclusion, social engagement and integration; opportunities for socio-cultural identity formation; support for cultural and bicultural competence. Positive Social Norms – Rules of behavior, expectations, and injunctions, ways of doing things, values and morals, obligations for service. Support for Efficacy and Mattering – Youth-based, empowerment practices that support autonomy, making a real difference in one's community, and being taken seriously. Practice that includes enabling, responsibility granting, meaningful challenge. Practices that focus on improvement rather than on relative current. Opportunities for Skill Building – Opportunities to learn physical, intellectual, psychological, emotional, social skills; exposure to intentional learning experiences; opportunities to learn cultural literacy, media literacy, communication skills, and good habits of mind; preparation for adult employment; opportunities to develop social and cultural capital. Integration of Family, School, and Community Efforts – Concordance, coordination, and synergy among family, school and community. The results found that Women reported highest score in agreeableness, neuroticism. Men scored highest in extraversion, consciousness, openness.

Keywords: Youth, positiveness, development

Introduction

The concept and practice of positive youth development "grew from the dissatisfaction with a predominant view that underestimated the true capacities of young people by focusing on their deficits rather than their development potential." Encouraging the positive development of adolescents can help to lessen the likelihood of such problems arising by easing a healthy transition into adulthood. Research findings point out that PYD provides a sense of "social belonging" or "social membership," participatory motivation in academic-based and community activities for positive educational outcomes, developing a sense of social responsibility and civic engagement, participating in organized activities that would aid in self-development etc.

Positive Youth Development (PYD) is based on the belief that, given guidance and support from caring adults, all youth can grow up healthy and happy, making positive contributions to their families, schools, and communities. The term "positive youth development" often generates several different responses. Most commonly people hear "youth development" and think of child and adolescent development, meaning biological, social, emotional, and cognitive development. Or they think of youth services, all the programming and services communities provide to young people to address their needs and foster their growth. Or they might think of a distinct approach or philosophy of interacting and working with young people, one that informs programming and promotes adolescent development. It understand positive youth development as an approach or philosophy that guides communities in the way they organize services, supports, and opportunities so that all young people can develop to their full potential.

Corresponding Author:

YD Haritha

Department of Human
Development and Family
Studies, College of Community
science, Acharya N. G. Ranga
Agricultural University, Guntur,
Andhra Pradesh, India

Positive youth development originated from ecological systems theory to focus on the strengths of adolescents. It is also similar conceptually with the principles of positive psychology. Central to its philosophy, the theory of PYD suggests that "if young people have mutually beneficial relations with the people and institutions of their social world, they will be on the way to a hopeful future marked by positive contributions to self, family, community, and civil society."

The major catalyst for the development of positive youth development came as a response to the negative and punitive methods of the "traditional youth development" approach. The traditional approach makes a connection between the changes occurring during adolescent years and either the beginning or peaking of several important public health and social problems including homicide, suicide, substance use and abuse, sexually transmitted infections and teen and unplanned pregnancies.

Positive youth development models, born from positive psychology research, can aid youth practitioners in achieving desired positive outcomes including increased optimism, strong social connections and healthy self-confidence. Positive youth development is an ideal platform for the application of positive psychology. Adolescent coaching provides adolescents with an opportunity to maximize their potential and improve their overall wellbeing through vision, action and accountability. Positive youth development addresses the ways in which adolescents can integrate positive psychology research and interventions into private and group coaching sessions, in order to affect lasting positive change on adolescents' self-esteem, friendships, and future orientation.

The establishment of a sound positive environment around youths is a key to their effective functioning and survival. Positive environment is dependent on positive relationships and strengths established at school, family or social environment through interactions with parents, teachers, peers and society. The development of a positive ethos within youths is the foundation for better opportunities to understand themselves as youths and engage in activities that would lead physical, psychological and social upliftment of the youth—'Positive Youth Development' will enable youths to become successful learners, confident individuals, responsible citizens and effective contributors.

Youth development gained a much greater following in the 1980s, though, when it became clear that prevention programs targeting specific "risky" behaviors were either not achieving significant positive results or were not doing enough to help youth become healthy, productive members of society. As Karen Pittman, a noted youth researcher, famously observed: "Problem free is not fully prepared." She advocated for a massive conceptual shift "from thinking that youth problems are merely the principal barrier to youth development to thinking that youth development serves as the most effective strategy for the prevention of youth problems."

In a systematic review Catalano *et al.* (2004) ^[1] looked at which interventions achieve best results in boosting the positive development of children and young people and preventing problematic behaviour. This review found 77 well-researched interventions which answer to the criteria they listed for positive youth development programmes. Significant impact of interventions has been found in among others interpersonal skills, quality of relationships with adults and peers, problem solving and cognitive competences, personal effectiveness and educational achievement. Some interventions also showed impact on decrease of problematic

behaviour, such as the use of drugs and alcohol, smoking, aggressive behaviour and other problematic behaviour in school. Positive youth development programs typically recognize contextual variability in youths' experience and in what is considered healthy or optimal development for youth in different settings or cultures. This cultural sensitivity reflects the influence of Bronfenbrenner's ecological systems theory. The influence of ecological systems theory is also seen on the emphasis many youth development programs place on the interrelationship of different social contexts through which the development person moves (e.g. family, peers, school, work, and leisure). The University of Minnesota's Keys to Quality Youth Development summarizes eight key elements of programs that successfully promote youth development. Such programs are physically and emotionally safe, give youth a sense of belonging and ownership and foster their self-worth, allow them to discover their "selves" (identities, interests, strengths), foster high quality and supportive relations with peers and adults, help youth recognize conflicting values and develop their own, foster the development of new skills, have fun, and have hope for the future.

Flay, B. R. (2002) ^[2] found comprehensive programs with positive results in multiple domains like that of risky/unhealthy/antisocial behaviors, poor mental health, and poor academic achievement.

Roth, J. L. and J. Brooks-Gunn (2003) ^[3] concluded drawing on both the literature and the results from a survey of highly regarded youth development programs, 3 defining characteristics of the youth development program-program goals, atmosphere, and activities. The results suggested a provisional definition of youth development programs based on the prevalent aspects of the goals, atmosphere, and activities reported by respondents. Youth development programs seek not only to prevent adolescents from engaging in health-compromising behaviors but to build their abilities and competencies. Youth development programs seek not only to prevent adolescents from engaging in health-compromising behaviors but to build their abilities and competencies. They do this by increasing participants' exposure to supportive and empowering environments where activities create multiple opportunities for a range of skill-building and horizon-broadening experiences.

Siu AM, Cheng HC, Leung MC (2006) reviewed longitudinal studies that have shown prosocial behavior increases gradually over adolescence, and that the development of prosocial behavior is closely linked to the development of moral reasoning, perspective taking, and regulation of personal distress. It was noteworthy to find that females have a higher prosocial orientation than males, and peer influence could be a major mediating factor of interventions to foster prosocial norms and behavior during adolescence.

McDonald, C. C., *et al.* (2011) ^[13] observed that their study helps to better delineate relationships between community violence exposure and positive youth development by adding new knowledge to the literature on the role of family functioning. Points of intervention should focus on families, with attention to parental figures in the home and overall family functioning.

Schmid, K. L., *et al.* (2011) ^[4] Results indicated that earlier hopeful expectations for the future may be influential for later intentional self-regulation abilities, although both constructs were strong predictors of positive youth development in middle adolescence.

Mueller MK., *et al.* (2011) ^[4] examined the relationship between adolescents' self-regulation skills (selection, optimization, and compensation) and their participation in youth development (YD) programs across Grades 8 and 9 in predicting Grade 10 PYD and Contribution. Results indicated that while self-regulation skills alone predicted PYD, self-regulation and YD program participation both predicted Contribution.

Robert J. Barcelona and William Quinn (2011) ^[5] performed extensive literature review on Positive youth development programs from the year 2000-2010. This review identified 12 main topical areas that best captured the breadth of positive youth development research. These 12 nonexclusive topical areas (i.e. studies could, and often did, encompass more than one topic) included professional development, youth activities, youth development processes and outcomes, academic engagement, positive youth development influence on risk behavior, youth engagement, resilience, asset- and capacity-building, family, health and wellness, peer relationships, and youth-adult relationships.

Youth psychosocial development is influenced by individual and environmental/contextual factors associated with adolescent wellbeing. Several studies reported gender and age differences in adolescent wellbeing. Some analyses showed that, compared with boys, girls (especially older adolescent girls) increasingly report more emotional problems, internalizing problems, lower life satisfaction, and more frequent multiple health complaints (Cosma *et al.*, 2020) ^[6]. A positive youth development (PYD) perspective focused on recognizing psychosocial strengths and providing social environments that contribute to the adolescent's global development, including promoting wellbeing (Richardson *et al.*, 2017) ^[7]. So, it seems important to understand how the adolescent's positive development differentiates the impact on gender wellbeing, trying to promote the overall adolescent wellbeing.

Some authors have argued that the youth developmental transition to adulthood now has been extended to 29 years, lasting longer than ever (Arnett *et al.*, 2014; Sawyer *et al.*, 2018) ^[8, 9]. Although developmental psychology has paid more attention to risk behaviors and emotional problems in this transition, it may be further characterized as a process of growth and building competence (Larson, 2008) ^[10]. Thus, research on youth development has followed a deficit perspective, which in turn has a guide policy design (Geldhof *et al.*, 2014) ^[11]. In the last decade, the study of positive indicators has increased, since the results of intervention programs have underlined that promoting healthy youth development requires a strength-based approach, not only addressing risks and vulnerabilities (Kia-Keating *et al.*, 2010) ^[12]. Within the PYD framework, positive development can be operationalized by the "five Cs" of PYD—competence, confidence, connection, character, and caring (Bowers *et al.*, 2011; Geldhof *et al.*, 2011; Lerner *et al.*, 2014) ^[4, 4, 14]. Competence represents an ability to navigate youth contexts effectively in order to achieve desired goals. Confidence arises when the navigation of one's context results in feelings of personal agency and self-worth. Character represents the internalization of moral standards through repeated person-context relations as well as the behavioral manifestations of that moral code. Caring indicates developmentally and contextually appropriate levels of concern for others, and connection requires that the individual be embedded in, and supported by, a reliable and diverse social network (Geldhof

et al., 2019) ^[14].

These PYD domains are interconnected and young people require a healthy development in all of them to experience adaptive development (Geldhof *et al.*, 2019) ^[14].

Holsen *et al.* (2017) ^[15] observed in a study involving 1,195 upper secondary school students (ages 16–19) in Norway and 839 participants of the 4-H Study of PYD in the United States, that the five C's tended to correlate positively with indicators of adaptive development and negatively with maladaptive outcomes. The only unexpected finding was a positive correlation between caring and anxiety and depressive symptoms (Holsen *et al.*, 2017) ^[15].

Årdal *et al.* (2018) ^[16] found that only the competence, confidence, and connection factors predicted school satisfaction. Competence, confidence, and connection fully mediated the effect of school empowerment on school satisfaction. In terms of gender, the five C's were more strongly related to school empowerment and school satisfaction for girls than for boys (Årdal *et al.*, 2018) ^[16].

In Portugal, from 2014 the Social Adventure team was a pioneer in the implementation of a nationwide project called Dream Teens aiming at enhancing young people's participation and active citizenship in the Portuguese context. The Dream Teens project used an innovative PYD approach that engaged Portuguese youth (aged 11–18 years). Participants from all over the country were empowered (1) to design and conduct research activities about their behaviors and about their life contexts and (2) to create ways to improve youth civic participation in their communities, while developing supportive interactions with adults and peers (Matos *et al.*, 2015; Branquinho and Matos, 2018) ^[17, 18]. A few other projects were derived from this, either developing youth positive development and participation throughout their empowerment.

Still in Portugal, Matos *et al.* (2017, 2018) ^[18] performed two studies that analyzed the association between the five C's of PYD and several psychosocial variables (i.e., resilience, self-regulation, anxiety, perception of academic abilities, goals, and expectations) in a sample of 2,700 young people with a mean age of 21 years and found a tendency for psychosocial variables to have a significant impact on total PYD and its five dimensions (competence, caring, character, confidence, and connection). And yet, Tomé *et al.* (2020) ^[19] observed in their study that the five C's were generally related to adolescents' mental health and wellbeing. Specifically, confidence, connection, and competence were relevant features regarding young people's wellbeing. That is, adolescents with higher levels of confidence, connection, and competence, had better wellbeing. So, ensuring that young people are thriving also means enhancing their mental health and wellbeing.

At the core of youth empowerment is the belief that young people are capable of incredible things. When young people have exposure to inspiring ideas and opportunities and the tools to build their confidence – they can take on anything and everything.

An empowered young person recognizes their capabilities, self-determination and worth. They feel comfortable trying new things. They have the confidence to take risks and are aware that failure is a step toward progress, not a sign to give up. They don't use the opinions of others as their guideposts in life. They stand up for their values. And they know they have built a foundation of self-empowerment to rely on in times of struggle or when they are feeling lost and need to

recalibrate. Youth empowerment is incredibly important – it gives kids and teens the courage to believe in themselves, to not be swayed by the opinions of others, and to go after their dreams.

While some kids and teens are born with an innate sense of what if and the courage to act on it, most look to the world around them to gain the ideas, excitement and skills to explore their potential and test the waters of their capabilities. Encouragement and opportunities go a long way in helping a kid or teen come out of their shell and take on new experiences, and a caring mentor – parent, caregiver, teacher or youth development provider – can be a powerful ally in youth empowerment.

Here are a few ways can help empower a young person in the life

Help kids and teens explore their interests and potential: Getting curious is the first step to feeling empowered. Read books and watch movies together about a variety of pursuits and careers and see where individual kid's interests are. Ask questions like "Can person see self-doing something like this?" When they take on a hobby, explore different ways they can build on this interest and deepen confidence in their abilities.

Give them the space and trust to practice autonomy: Kids and teens are natural contributors, but often don't feel adults expect them to do things well or participate at all. Offer safe, supportive opportunities for his/her kid to be autonomous and make clear the expectations for their contributions – whether that's a toddler learning to take their plate to the dishwasher or empowering a teenager to decorate their own space.

Speak with honesty: Knowledge is power, and when we are open, direct and honest with young people, this not only helps expand their understanding of the world around them, but it builds their own self-awareness. Equipped with information to be successful, they are more likely to see the big picture and

make smarter decisions, while not sweating the small stuff.

Trust their ability as leaders: From working on school projects to managing a household chore to leading community service events, in youth-led efforts, let young people own the trajectory of the assignment, from planning to execution. Individual can always be a safety net for when they make mistakes or need to be redirected but give them the space to try it their way first. Afterwards, ask for their feedback on what went right and what could be improved.

When youth are empowered, they feel confident and capable. They become active contributors and collaborators, excited to explore their impact on the world around them.

The Field of Positive Youth Development: As an academic field of study, positive youth development has been emerging over the last two decades. Reed Larson, a professor at the University of Illinois, wrote one of the pioneering articles in 2000 where he claimed that "psychology has neglected the positive...Development, after all," Larson said, "is a process of growth and increasing competence."

As a developmental psychologist, my work and research recognizes the natural and manifest potential of youth. While parents and schools are often quick to blame each other when children fail to thrive, it is time for a change in perspective. Why? Because the decisions about parenting, educating, and mentoring children depends a great deal on how we think about positive youth development, how we define success, and what questions individual ask of self.

Research Method

It focused on age group of 11 to 24 years. The main focus of the study was to study on "Positive youth development: Study on personality of adolescents"

Research Findings and Discussion

Big Five inventory tool includes areas: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness

Table 1: Big Five inventory tool includes areas

| S. No | Item | Category | Males (n=50) | | Females (n=50) | | Total (n=100) | |
|-------|-------------------|----------|--------------|----|----------------|----|---------------|----|
| | | | F | % | F | % | F | % |
| 1. | Extraversion | High | 48 | 96 | 38 | 76 | 86 | 86 |
| | | Average | 1 | 2 | 7 | 14 | 8 | 8 |
| | | Low | 1 | 2 | 5 | 10 | 6 | 6 |
| 2. | Agreeableness | High | 42 | 84 | 47 | 94 | 89 | 89 |
| | | Average | 5 | 10 | 2 | 4 | 7 | 7 |
| | | Low | 3 | 6 | 1 | 2 | 4 | 4 |
| 3. | Conscientiousness | High | 47 | 94 | 43 | 86 | 90 | 90 |
| | | Average | 1 | 2 | 5 | 10 | 6 | 6 |
| | | Low | 2 | 4 | 2 | 4 | 4 | 4 |
| 4. | Neuroticism | High | 35 | 70 | 48 | 96 | 83 | 83 |
| | | Average | 10 | 20 | 1 | 2 | 11 | 11 |
| | | Low | 5 | 10 | 1 | 2 | 6 | 6 |
| 5. | Openness | High | 46 | 92 | 34 | 68 | 80 | 80 |
| | | Average | 3 | 6 | 9 | 18 | 12 | 12 |
| | | Low | 1 | 2 | 7 | 14 | 8 | 8 |

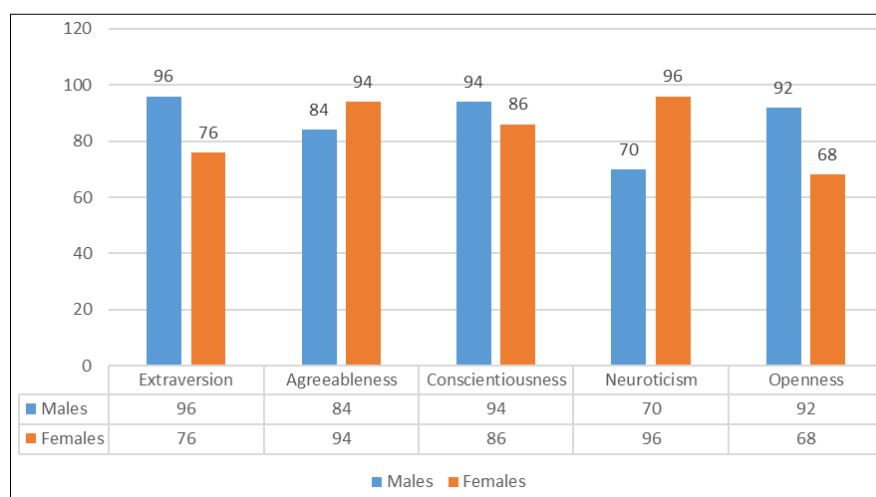


Fig 1: Big Five inventory tool includes areas

Extraversion deals with Gregariousness (sociable), Assertiveness (forceful), Activity (energetic), Excitement-seeking (adventurous), Positive emotions (enthusiastic), Warmth (outgoing). In this area 86% of the youth fallen in high category, 8% of the youth fallen in average and 6 percent were fallen in low category.

Agreeableness deals with Trust (forgiving), Straightforwardness (not demanding), Altruism (warm), Compliance (not stubborn), Modesty (not show-off), and Tender-mindedness (sympathetic). In this area 89% of the youth fallen in high category, 7% of the youth fallen in average and 4 percent were fallen in low category.

Conscientiousness deals with Competence (efficient), Order (organized), Dutifulness (not careless) Achievement striving (thorough), Self-discipline (not lazy), Deliberation (not impulsive). In this area 90% of the youth fallen in high category, 6% of the youth fallen in average and 4 percent were fallen in low category.

Neuroticism deals with Anxiety (tense), Angry hostility (irritable), Depression (not contented), Self-consciousness (shy), Impulsiveness (moody), Vulnerability (not self-confident). In this area 83% of the youth fallen in high category, 11% of the youth fallen in average and 6 percent were fallen in low category.

Openness deals with Ideas (curious), Fantasy (imaginative), Aesthetics (artistic), Actions (wide interests), Feelings (excitable), and Values (unconventional). In this area 80% of the youth fallen in high category, 12% of the youth fallen in average and 8 percent were fallen in low category.

Women reported highest score in agreeableness, neuroticism. Men scored highest in extraversion, conscientiousness, openness.

Conclusion

The data collected with respect to understand the study on "Positive youth development: study on personality of adolescents". Positive youth development motivates youth to achieve their full capacity and energies themselves for active engagement in meta-development. The establishment of a sound positive environment around youths is a key to their effective functioning and survival. Positive environment is dependent on positive relationships and strengths established at school, family or social environment through interactions with parents, teachers, peers and society. The development of a positive ethos within youths is the foundation for better opportunities to understand themselves as youths and engage in activities that would lead physical, psychological and social

empowerment of the youth.

Positive youth development is the practice of nurturing core internal strengths and abilities in children and teens. It is about providing opportunities for youth to believe in themselves and their abilities to influence their lives and the world around them.

As families, schools, and communities, it share one goal. Individual want children to thrive. It wish for happy, healthy, and successful children who flourish as adults. A straightforward goal; yet every parent and teacher understands its challenges.

Young people are often the most creative and innovative actors in society – think designers, artists, engineers, and entrepreneurs. They take risks and try out new ideas, often having no prior experience to fall back on if something goes wrong. They are also very optimistic about their ability to make a difference in the world.

Many people think that youth are powerless and that their voices cannot make a difference in the world.

First and foremost, young people want to make the world a better place for themselves and for those around them. They may not have a lot of money or power, but they have the energy and the will to learn. Young people have great potential because they have never been in power before. They are not too bound by the expectations of their families, so they have the freedom to dream big and try new things. They do not yet know what is possible, but they are not afraid to try.

References

1. Catalano R, Berglund M, Ryan J, Lonczak H, Hawkins D. Positive youth development in the United States: Research findings on evaluations of positive youth development programs; c2004.
2. Flay BR. Positive youth development requires comprehensive health promotion programs. *American Journal of Health Behavior*. 2002;26(6):407-424.
3. Roth JL, Brooks-Gunn J. What exactly is a youth development program? Answers from research and practice. *Applied Developmental Science*. 2003;7(2):94-111.
4. Lerner RM, Lerner JV, Lewin-Bizan S, Bowers EP, Boyd MJ, Mueller MK, *et al*. Positive youth development: Processes, programs, and problematics. *Journal of Youth Development*. 2011 Sep 1;6(3):38-62.
5. Cameron KS, Quinn RE. Diagnosing and changing organizational culture: Based on the competing values

- framework. John Wiley & Sons; c2011, Feb 10.
6. Padoan A, Cosma C, Sciacovelli L, Faggian D, Plebani M. Analytical performances of a chemiluminescence immunoassay for SARS-CoV-2 IgM/IgG and antibody kinetics. *Clinical Chemistry and Laboratory Medicine (CCLM)*. 2020 Jul 1;58(7):1081-1088.
 7. Acharya VV, Pedersen LH, Philippon T, Richardson M. Measuring systemic risk. *The review of financial studies*. 2017 Jan 1;30(1):2-47.
 8. Arnett JJ, Žukauskienė R, Sugimura K. The new life stage of emerging adulthood at ages 18–29 years: Implications for mental health. *The Lancet Psychiatry*. 2014 Dec 1;1(7):569-76.
 9. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *The Lancet Child & Adolescent Health*. 2018 Mar 1;2(3):223-8.
 10. Monticelli L, Kandasamy SK, Periole X, Larson RG, Tieleman DP, Marrink SJ. The MARTINI coarse-grained force field: extension to proteins. *Journal of chemical theory and computation*. 2008 May 13;4(5):819-34.
 11. Geldhof GJ, Preacher KJ, Zyphur MJ. Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological methods*. 2014 Mar;19(1):72.
 12. Kia-Keating M, Sorsoli L, Grossman FK. Relational challenges and recovery processes in male survivors of childhood sexual abuse. *Journal of Interpersonal Violence*. 2010 Apr;25(4):666-83.
 13. McDonald CC, Deatrick JA, Kassam-Adams N, Richmond TS. Community violence exposure and positive youth development in urban youth. *Journal of community health*. 2011 Dec;36(6):925-32.
 14. Khan S, Taverna F, Rohlenova K, Treps L, Geldhof V, de Rooij L, *et al*: A database of endothelial cell transcriptomics data. *Nucleic acids research*. 2019 Jan 8;47(D1):D736-44.
 15. Stratton GR, Dai F, Bellona CL, Holsen TM, Dickenson ER, Mededovic Thagard S. Plasma-based water treatment: efficient transformation of perfluoroalkyl substances in prepared solutions and contaminated groundwater. *Environmental science & technology*. 2017 Feb 7;51(3):1643-8.
 16. Årdal E, Holsen I, Diseth Å, Larsen T. The Five Cs of Positive Youth Development in a school context; gender and mediator effects. *School Psychology International*. 2018 Feb;39(1):3-21.
 17. Matos AC, Marques CF, Pinto RV, Ribeiro IA, Gonçalves LM, Vaz MA, Ferreira JM, Almeida AJ, Bettencourt AF. Novel doped calcium phosphate-PMMA bone cement composites as levofloxacin delivery systems. *International journal of pharmaceutics*. 2015 Jul 25;490(1-2):200-8.
 18. Hua S, De Matos MB, Metselaar JM, Storm G. Current trends and challenges in the clinical translation of nanoparticulate nanomedicines: Pathways for translational development and commercialization. *Frontiers in pharmacology*. 2018 Jul 17;9:790.
 19. Brown PD, Gondi V, Pugh S, Tome WA, Wefel JS, Armstrong TS, Bovi JA, Robinson C, Konski A, Khuntia D, Grosshans D. Hippocampal avoidance during whole-brain radiotherapy plus memantine for patients with brain metastases: phase III trial NRG oncology CC001. *Journal of Clinical Oncology*. 2020 Apr 4;38(10):1019.