Literature Review: Latest Evidence on Community Gardens and the Impact They Have on Health and Social Outcomes.

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What is Flourish PYO?

Flourish PYO is a Toowoomba-based Health Promotion Charity established in 2018.

Flourish PYO has several objects, including:

1. *To improve food security for the entire Toowoomba community, particularly for families and individuals from low income backgrounds, by growing produce for picking, sale and distribution.*
2. *To provide mentoring and education to the community to increase consumption of fresh healthy produce in their daily lives, consequently improving nutrition, to reduce the risk of developing chronic lifestyle-related health problems and conditions.*

The following literature review examines the latest evidence in relation to community gardens and the impact they have on health and social outcomes. This document also details how Flourish PYO aims to use community gardens in order to benefit the Toowoomba community. This document is designed to be read in conjunction with, "Literature Review: Latest Evidence on Food Security and Lifestyle Related Chronic Disease and How Flourish Aims to Address These Issues in the Toowoomba Region", written by Anna Morgan (Accredited Practicing Dietitian), 2018.

Flourish will be partnering with local organisations to develop and maintain community gardens for use by the general public free of charge. We do this in order to meet our above aims, that is to improve food security and to promote the consumption of fruit and vegetables, therefore reducing the risk of lifestyle related chronic diseases.

Community gardens have enjoyed a resurgence of popularity in Australia during recent times. In the past 20 years, there has been an increasing amount of Australian and international research done on the impact Community Gardens have on participants and communities. The following literature review details the findings of recent research, and how Flourish PYO aims to use Community Gardens as a tool to improve health and social outcomes in the Toowoomba region.

What is a Community Garden?

A community garden is defined as:

> …sections of land collectively gardened for the specific purpose of growing fruits, vegetables and/or herbs for self-consumption; and include allotments, school gardens as well as teaching/demonstration gardens. (7, p.348).

Other sources (3) expand the purpose of these gardens to include provision of food for the wider community as well as participants.

How Do Community Gardens Impact on Food Security?

What is food security?

According to the World Health Organisation, "there are three key components of food security:

1. Food access: the capacity to acquire and consume a nutritious diet, including:
- The ability to buy and transport food
- Home storage, preparation and cooking facilities
- Knowledge and skills to make appropriate choices
- And time and mobility to shop for and prepare food

2. Food availability:
- Location of food outlets
- Availability of food within stores and
- Price, quality and variety of available foods

3. Food use: the appropriate use of food based on knowledge of basic nutrition and care." (211).

Flourish will use community gardens to address both food access and availability. Other Flourish projects such as cooking groups and education sessions will address food use. Please refer to "Literature Review: Latest Evidence on Food Security and Lifestyle Related Chronic Disease and How Flourish Aims to Address These Issues in the Toowoomba Region"(written by Anna Morgan APD, 2018) for further details on statistics of how many people experience food insecurity, effects of food insecurity and population groups who are most at risk of food insecurity.

Evidence that Community Gardens Impact on Food Security

There is ample evidence in the literature which demonstrates that community gardens have a positive impact on food security. Specific effects include:

- Increased access to high quality fresh fruit and vegetables (3, 1, 18, 9, 4) all year round.
- Reduced money spent on food (3, 1, 18). Carney et al. (2012) ran a community-based participatory research project with a total sample size of 42 families. 31.2% of participants had previously worried that 'food would run out before money was available to buy more', in comparison to 3.1% while they were participating in the community garden project. (4, p.874).
- Reduced consumption of fast food (3) since there was improved access to alternative fresh produce.
- Reduction in transportation barriers (1).
- Improved selection of produce available (1).
- Barnidge et al. (2013) described a 'ripple effect' where the fresh produce grown benefited not only the community garden participants, but the food was also distributed to the wider community.
- Harris, Minniss & Somerset (2014) examined a large community garden in Logan, Queensland which targeted African refugees. The study concluded that the garden made a "contribution to food security through enhanced access to culturally appropriate foods…" (9, p9210)

How do Community Gardens Impact on the Physical Health of Participants?

Increased fruit and vegetable consumption

There is a strong link between participation in community gardens and increased intake of fruit and vegetables (3, 1, 18, 16).

- Barnidge et al. (2013) found that "…community garden participation was significantly and positively associated with meeting daily fruit and vegetable recommendations…with a more than two-fold increase in likelihood for meeting daily fruit and vegetable recommendation." (3, p.135).
- Alaimo, Packnett, Miles & Kruger (2008) stated that, "adults with a household member who participated in a community garden consumed fruits and vegetables 1.4 more times per day than those who did not participate, and they were 3.5times more likely to consume fruits and vegetables at least 5 times daily." (1, p.95)
- McCormack, Laska, Larson & Story (2010) examined 4 cross-sectional studies and found positive relationship between community garden participation and consumption of fruit and vegetables. In a study by Alaimo and colleagues, "…adults living in households with community garden participant(s) reported consuming fruits

and vegetables 4.4 times/day compared with 3.3 times/day among people in non-gardening households" (18, p.402). In another study examined, Blaire found a "significantly greater consumption of a variety of healthy produce" consumed (18, 403).

- Loso et al. (2018) found that "gardening interventions have been shown to increase fruit and vegetable intake among school-aged children" (16, p.1). Christian, Evans, Conner, Ransley & Cade (2012) found that, "…children who were introduced to new foods using 'hands-on' activities…were 3-20 times more likely to subsequently choose and eat these foods…" (5, p.305) in an alternative environment.

Reduced Body Mass Index

Two studies found a link between participation in community gardening and a reduced BMI (14, 13).

Increased Physical Activity

Four articles examined the relationship between participation in community gardening and physical activity levels. All four found community gardeners to be more physically active than non-gardeners (23, 14, 4, 19).

Reduced Chronic Disease Risk

As previously detailed, there is clear evidence that participation in community gardening results in an increased intake of fruit and vegetables. There is also convincing evidence that eating sufficient fruit and vegetables (as per the Australian Dietary Guidelines) can reduce the risk of developing the following chronic diseases:

- Some cancers
- Cardiovascular disease risk factors and heart failure
- COPD risk and respiratory symptoms
- Adult asthma
- Type 2 diabetes
- Hypertension
- Weight management

For a full report on the evidence on how consumption of fruit and vegetables impacts on chronic disease risk factors, please refer to "Literature Review: Latest Evidence on Food Security and Lifestyle Related Chronic Disease and How Flourish Aims to Address These Issues in the Toowoomba Region" (written by Anna Morgan APD, 2018).

How do Community Gardens Impact on the Mental Health of Participants?

It is well documented that gardening has a positive impact on mental health (23, 13, 6, 17). Reasons for this link were discussed in the literature:

- "…natural and green environments tend to have a positive effect on mental health and psychological wellbeing" (11, p.32). Green spaces have a "restorative function which alleviates and reduces stress" (13, p.1751).
- Participants had social supports where they gained a "sense of worth and involvement", while the environment provided a "sanctuary where people could come together and escape daily pressures" (12, p.207).
- Fostering feelings of "wellbeing and self-reliance"…"achievement and feelings of happiness and success" (11, p.9207).
- Mediative aspect of gardening where participants can "experience the beauty of the environment…solace, peace and harmony" (17, p.338).
- "…active involvement in a structured environment, which is built upon socialization, teamwork, and completing goals as a collective" (6)

How Do Community Gardens Impact on Social and Community Wellbeing?

Many research articles have focused on the positive impact community gardening has on the participant's social wellbeing (13, 24, 17, 11, 4, 9) and community wellbeing (13, 8, 22, 11, 7, 9). Reasons discussed in the literature included:

- Formation of new relationships (18) based on common interests.
- Participants feel "….safe, accepted, valued and sense of belonging and contribution to a broader purpose" (13, p.1752).
- "Intercultural socialisation and knowledge sharing" (17 p.340). Harris et al. (2014) examined a Logan-based community garden for refugees. They stated that community gardens help participants to integrate into a new society through giving "…marginalised populations an opportunity for intercultural activity" (9, p.9207).
- "Intergenerational socialisation and knowledge sharing" (17, p.340)
- Strengthening of family ties as community gardens facilitate quality family time (4)
- Community gardens "build cohesion and vitality in a community, construing to the generation of bonding, bridging and linking social capital" (8, p.555)
- "Increased social cohesion (the sharing of values enabling identification of common aims and the sharing of codes of behaviour governing relationships), social support (having people to turn to in times of crisis) and social connections (the development of social bonds and networks)" (11, p. 525).

How Do Community Gardens Impact on the Physical Environment?

Research articles listed the following benefits of community gardens on the physical environment:

- Beautification of the physical environment (15, 10, 17).
- Increasing neighbourhood 'attachment' (15)
- Participants experiencing the "…fundamental processes of food growth…"(15)
- Increased environmental concern (19) and the notion that participants became environmental stewards (19)
- Less chemicals used in food production (4)
- Knowledge about ecology systems (1)
- Connecting people with nature (1)
- Green spaces potentially increase nearby property values (1)

What are the Difficulties Associated with Community Gardens?

There was limited research into the negative effects of community gardens, however the following was listed:

- Reliance on volunteers (17)
- Unstable funding (17)
- Potential exposure to environmental toxins (2)
- Concerns regarding contamination of soil (23)
- Unsecure land tenures (23)
- Bureaucratic resistance (23)
- Limited understanding and awareness of the general community and decision makers (23)

How can Flourish Utilise Community Gardens to Improve the Health and Social Outcomes of the Local Community?

Flourish will be partnering with local organisations and the community to develop and maintain community gardens, for use by the general public free of charge. Low socio-economic areas will be targeted. In this setting, nutritional education will be provided on-site, including the provision of recipe/nutrition cards. Participants will also be invited to attend other Flourish programs, including cooking classes and health promotion sessions.

Short-term, excess produce will be donated to families with food access issues and/or local charities who address food insecurity.

Longer-term, our community gardens may also provide culturally appropriate produce for culturally diverse groups. We may also use a food van to travel to "hot spots" in our region, to sell our excess produce at cheaper/discounted rates to those at risk of food insecurity (ie. for those with a Health Care Card/Pension Concession Card).

Flourish PYO will use community gardens as a tool in order to address the following health and social outcomes:

- Increase accessibility and therefore increase the consumption of fresh fruit and vegetables of participants and the wider community
- Reduce BMI of participants
- Increase the physical activity of participants
- Reduce the chronic disease risk of participants
- Improve the mental health of participants
- Improve the social wellbeing of participants
- Improve the social cohesion, support and connections of the community

As outlined in the above literature review, there is solid evidence that community gardens will have a positive impact on both the physical, mental and social health of participants and the wider Toowoomba community.

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