Strategies to implement physical health monitoring in people affected by severe mental illness: a literature review and introduction to the Italian adaptation of the Positive Cardiometabolic Health Algorithm

Strategie per implementare il monitoraggio della salute fisica in soggetti affetti da disturbi psichiatrici gravi: revisione della letteratura e presentazione dell'adattamento italiano del Positive Cardiometabolic Health Algorithm

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Summary

Objectives
To review the strategies implemented in clinical practice to increase monitoring and active interventions to reduce cardiovascular risk in individuals with severe mental illness and their possible implementation in first episode psychosis (FEP) care.

Methods
A PubMed literature search was performed using the following key words: "metabolic syndrome", "antipsychotic", "schizophrenia", "psychosis", "severe mental illness", "intervention", "obesity", "weight", "physical health" and a combination of all above. Additional papers were identified through references and based on expert consultation as necessary.

Results
The review identified 14 studies in which a variety of different monitoring instruments were adopted in a range of clinical settings. Only three studies were carried out in subjects affected by FEP. The degree to which systematic monitoring was successfully utilised varied across studies and was mediated by a broad range of barriers. Nevertheless, some studies showed that the introduction of a systematic approach can improve the monitoring by up to 100%.

Conclusions
Despite heightened risk of developing cardiovascular and metabolic disorders, systematic monitoring of physical health is often suboptimal and haphazard. There is a paucity of specific protocols for people with FEP. Results seem more promising when the approach to physical health is multidisciplinary and integrated with primary care. In this regard, a computerized version of the Australian Positive Cardiometabolic Health Algorithm, along with a health check list completed by psychiatric nurses, seems to be the basis to improve monitoring and effective interventions aimed at preventing cardiovascular events in individuals suffering from FEP.

Key words
Cardiovascular disease • Early intervention • Metabolic syndrome • Obesity • Psychotic disorders

Introduction

Compared to the general population, people affected by schizophrenia have up to 20% shorter life expectancy, with cardiovascular disease representing the leading cause of death, occurring at a rate that is 10-fold higher than suicide [1-6]. Factors contributing to the overall poorer health are those associated with lifestyle, such as an unhealthy diet, lack of exercise and high rates of smoking [7 8]. While the distinction between first and second generation antipsychotics is becoming more controversial [9 10], some drugs described as belonging to the second generation antipsychotic (SGA) class appear more likely to affect the metabolic profile (e.g. clozapine and olanzapine) [11]. A matter of concern is represented by the fact that SGAs are usually preferred over typical antipsychotics in individuals affected by first episode psychosis (FEP) [12 13], despite a higher incidence of weight gain and metabolic side effects compared to the majority of first generation antipsychotics [9]. A large number of studies have reported high rates of metabolic syndrome among patients treated with SGAs; prevalence rates are over 50% for pre-diabetes or type II diabetes in adult psychiatric inpatient populations [14]. Moreover, younger

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individuals appear to be at higher risk than adults for developing weight gain and metabolic abnormalities related to antipsychotic treatment [14-17]. An average weight gain of 12 kg has been reported in patients with severe mental illness (SMI) within 24 months of their first psychotic episode and subsequent treatment [18]. In addition, as many as 9% of SMI patients are at high risk of cardiovascular disease (CVD) within 12 months of their FEP, due to their vulnerability to weight gain and metabolic dysfunction [18-20]. These alarming data clearly emphasise the importance of close monitoring of physical health in patients enrolled in FEP programs undergoing antipsychotic treatment. In response to these concerns, several management guidelines and quality standards have been published in recent years [21-40]. However, the evidence suggests that the availability of guidelines and standards does not always translate into their implementation in routine clinical practice [41].

The aim of this paper is to provide an overview of the most recent literature on strategies implemented in clinical practice to increase monitoring and active interventions to reduce cardiovascular risk in individuals suffering from severe mental illness and their possible implementation in care of first episode psychosis (FEP). The Italian adaptation of the Positive Cardiometabolic Health Algorithm.

Methods

A thorough literature search was performed on PubMed and Internet databases to identify articles dealing with strategies, adopted by different mental health providers worldwide, to implement monitoring and intervention for physical health in SMI. Words used, in varying combinations, were "metabolic syndrome", "antipsychotic", "schizophrenia", "psychosis", "severe mental illness", "intervention", "obesity", "weight", "physical health", "cardiovascular". Further references were extracted from selected articles based on authors' choices. Articles were excluded when full text was not available.

Results

A total number of 128 articles were identified; of 114 papers excluded, 47 reported efficacy of specific interventions, both pharmacological as non-pharmacological, rather than strategies to implement such intervention in routine care and therefore were not included in the current review, as shown in Figure 1. A total of 14 articles were finally selected, as reported in Table I.

Among the 14 articles identified, only three focused on people at first episode of psychosis (FEP), while 11 addressed the problem in people affected by a severe mental illness (SMI).

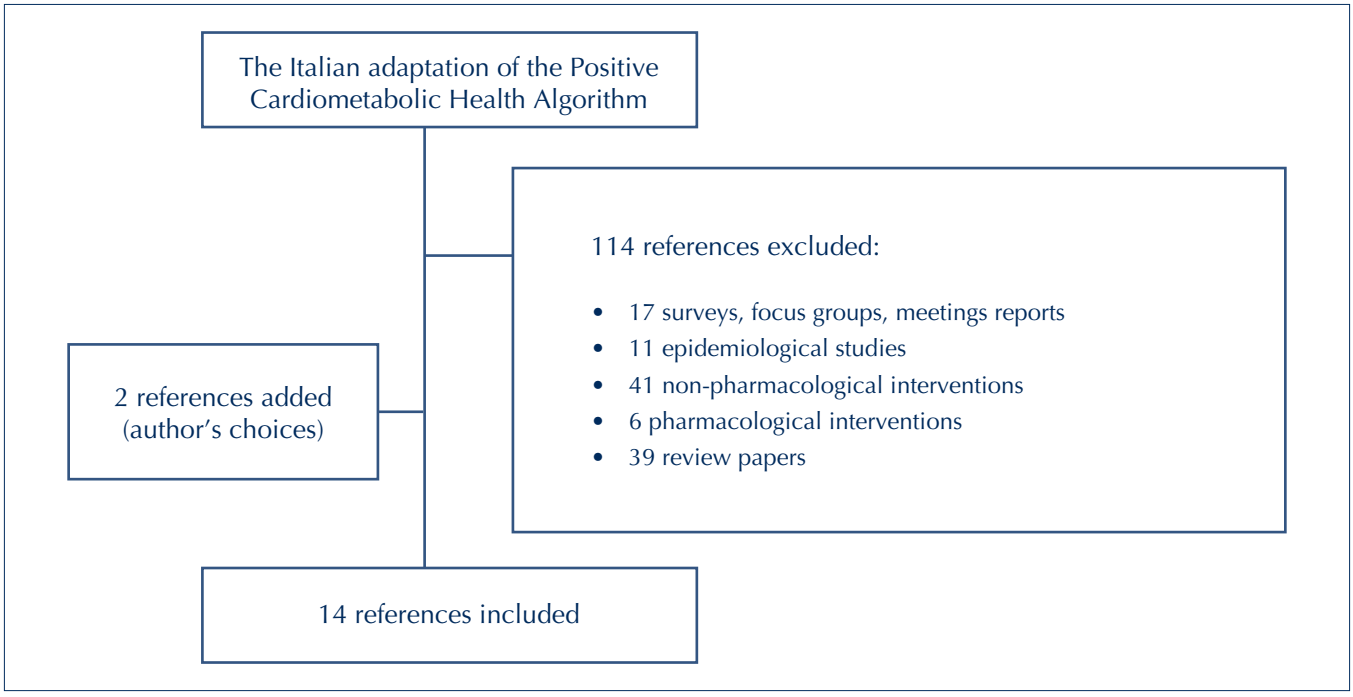

FIGURE 1.
Results. *Risultati.*

TABLE I.
Studies included in current review. *Studi selezionati ai fini della revisione della letteratura.*

First Author	Year	Country	Population studied	Method/methods applied	Results
Bressington	2014	Hong Kong	148 community-based patients with severe mental illness, Hong Kong population.	A consecutive prospective case series design. HIP** was used as a screening tool at baseline and repeated at 12 months follow-up	HIP** was feasible and useful, 93% applied at baseline. No statistical improvement in relation to health behaviours adopted by patients and indicators of vascular disease.
Curtis	2012	Australia	FEP† patients attending Bondi Service	Multidisciplinary approach using the paper sheet Positive Cardiometabolic Algorithm as framework.	NA‡
DelMonte	2012	USA	Psychiatric inpatient unit. 171 and 157 patients taking SGAs §, respectively in the pre-alert group, and post alert group.	Pop-up alert for ordering lipid and glucose checking.	Significantly improved rates of ordering fasting blood glucose and lipid levels. Significantly more post-alert laboratory orders were submitted at the same time as the SGA§, drug order. Overall rates remained suboptimal
Gonzalez	2010	UK	Community mental health Center. 126 patients pre-audit, 106 post-audit, all treated with antipsychotics.	Audit, 3 meetings with local consultants, 2 brief educational talks to junior doctors, single page monitoring tool sheet implemented.	Significant improvement in the performance of each test, except for glycated haemoglobin and prolactin.
Hardy	2012	UK	29 patients with SMI*.	To examine patients' views about the physical health check delivered by a nurse trained in the Northampton Physical Health and Wellbeing project	All of the patients reported that they had started to make changes to their lifestyle since the health check.
Hardy	2012	UK	92 Psychiatric patients and 416 diabetic patients	Invitation appointment letter to attend a physical health check in primary care. Comparison with patients affected by diabetes.	66% of SMI* vs. 81% diabetic patients attended the practice on the date stipulated in the letter.
Rosenbaum	2014	Australia	60 users, inpatient psychiatric unit.	Audit, educational training, including waist circumference measurement in the paper-sheet monitoring form.	Improved monitoring of waist circumference from 0 to 58%
Shuel	2010	UK	31 community patients with SMI*	Qualitative evaluation of a paper-sheet screening instrument implemented: the serious mental illness health improvement profile.	Qualitative feedback on the instrument was positive. 28 discreet interventions were used.
Thompson	2011	Australia	Patients with FEP† taking antipsychotics: 119 in the pre-intervention audit, 86 in the post-intervention audit.	Audit, analysis of barriers, provision of monitoring equipment, interactive educational events, reminders and prompts.	Significant improvements in both the screening and the monitoring of metabolic indices following initiation of antipsychotic medications. Improvements in the number of active interventions offered. Level of guideline concordant monitoring remained low.

(continues)

Table I - Follows

First author	Year	Country	Population studied	Method/methods applied	Results
Vasudev	2010	UK	15-bed male medium secure forensic psychiatric rehabilitation unit.	Audit cycle completed in 1 year. Physical health monitoring sheet introduced in the patients record.	Monitoring sheet adopted in 100% charts. Serum lipid and cardiovascular risk reduced.
Vasudev	2010	UK	Patients with SMI* under the care of early intervention psychosis service: 66 FEP† at baseline, 76 at re-audit.	Audit: evaluate physical health monitoring practices and Re-Audit. Letter to the general pratictioner for inviting patients taking a physical exam and lab tests.	The number of patients undergoing at least one annual physical health check increased from 20% to 58%.
White	2011	UK	Adult patients with a SMI*diagnosis.	Protocol: single blind parallel group randomised controlled trial with secondary economic analysis and process observation. To determine the effects of the HIP** programme on patient's wellbeing.	NA ‡
Wiechers	2012	USA	206 adult patients of a psychiatric resident outpatient clinic	Quality improvement intervention: focus group, resident education, and metabolic screening bundle for electronic devices.	Rates of screening single metabolic item increased between 3.5 to 10 fold. Screening for the full metabolic bundle increased 30 fold.
Wilson	2014	Australia	Physical health month (PHM)1: 224 users taking clozapine. PHM2: 232 users taking clozapine.	Audit, scheduled monitoring 6 months apart, lessons by physicians, overseen weekly.	Monitoring of physical health improved from 0 to 68%. Interventions did not increase.

Abbreviations:
*SMI: Severe Mental Illness; † FEP: First Episode Psychosis; ‡ NA: Not available; § SGAs: Second Generation Antipsychotics; **HIP: Health Improvement Profile

Strategies to improve physical health monitoring in FEP

Among the three papers dealing with strategies to improve physical health monitoring in FEP, two reported on studies performed in Australia [42 43] and one in the UK [44]; the aim was to adapt current guidelines to the stricter population of people affected by FEP. In order to overcome barriers to implementation of the UK NICE guidelines [45] on monitoring physical health in FEP, Vasudev et al, [46] carried out an audit. Actions implemented were: a) mandatory letters to general practitioners (GPs) emphasising the importance of physical tests, and b) a nurse-led support for patients to book two appointments with their GP (one for prescription of laboratory tests and physical examination, one for discussing results). A significant increase (from 20% to 58% screened) in the rates of physical health check performed in FEP patients was documented. Authors underlined that within the same period of time a Quality Outcome Framework (QOF) of the general medical services agreed to financially reward GPs who maintained a registry of people with SMI and checked their physical health annually [46]; this reward measure might have significantly contributed to the positive result of the audit. A year later Thompson et al. [42] carried out a study on measures to improve levels of screening and management of physical health within a FEP service in Australia. An analysis of possible barriers and enablers, availability of local guidelines, educational interventions, service changes, and provision of monitoring equipment preceded the study. Despite a significant improvement in both overall screening and initial monitoring of metabolic indicators in people enrolled in FEP services, rates of clinical management of physical health was still far from guidelines standards, underlying again the demand for more 'creative' strategies addressing specific needs of young people affected by FEP, such as, 'headspace' initiatives. In the field of FEP, 'The Bondi Early Psychosis Programme' targets young people (aged 15–25 years) experiencing their first episode of psychosis with the 'Keeping the Body in Mind Programme' lifestyle intervention as part of standard care [43]. The Bondi Service has developed a model of metabolic screening and a treat-

ment algorithm called "Positive Cardiometabolic Health" to provide clinicians with recommendations for early detection, prevention and intervention strategies targeting antipsychotic-induced metabolic abnormalities and cardiovascular risk factors [43].

Strategies to improve physical health monitoring in subjects with SMI

In the context of community mental health services, the strategies adopted to assess the level of awareness towards cardiometabolic risk in subjects with SMI have been mostly audits.

In 2010, Gonzalez et al. [47] performed an audit to improve physical health assessment in outpatient clinics: it included a review of medication charts and patient notes, 3 meeting with the local consultants and two brief educational talks, plus the introduction of a paper monitoring sheet. A significant improvement was reported in the overall performance of many laboratory tests, for example, glucose test prescription increased from 24.6% to 72.6%; however, the screening was still suboptimal and did not include anthropometric measures (waist circumference-WC, body mass index-BMI, blood pressure-BP, ECG monitoring).

Hardy et al. [48] performed an audit to promote attendance of patients suffering from SMI to GPs for an annual physical health check; a letter offering an appointment with a predetermined date and time at the GP office was sent to patients. Up to 70% patients with SMI attended their GP surgeries for a health check.

Wiechers [49] created a quality improvement intervention in an academic hospital psychiatric outpatient clinic to improve rates of metabolic screening in patients receiving antipsychotics. The core components of the intervention were focus groups, resident education and creation of a metabolic screening bundle template in electronic medical records, in addition to a focus group mid-way along the intervention to identify ongoing barriers to the intervention itself. The documentation increased from 1% to 31% of the full metabolic screening bundle, with blood pressure measure resulting the least documented index in charts. More recently, Wilson [50] carried out an audit focused on patients taking clozapine. He reported a suboptimal rate of health check monitoring; thus, he scheduled two monitoring visits 6 months apart for patients on clozapine during two "physical health months". Unfortunately, the increased level of physical health monitoring did not automatically translate into an appropriate documented intervention: in fact, only 30% of patients with metabolic syndrome were followed.

Accordingly to Hardy et al. [41] educational intervention itself could be the object of investigation, as the lack of evidence based education could strengthen the idea that monitoring physical health is not a necessary task and is not responsibility of psychiatric nurses. Offering education in this area will improve patient outcomes through a direct and/or indirect change in nurse attitude, knowledge and behaviours [41 51]. The same group subsequently developed a training package for practice nurses (PhyHWell) that was shown to be effective in modifying misconceptions regarding physical health in people with SMI [51].

A screening instrument, called Heath Improvement Profile (HIP), first developed and implemented by Shuel in 2010 [52] was adopted by Bressington et al. [53] in a community outpatient sample in Hong Kong. HIP is a 27-item screening and change tool that directs nurses and patients to select interventions to improve physical health. The implementation was found to be feasible and useful to identify areas where physical health requires intervention. To test which instruments were more effective in improving physical wellbeing in patients with SMI than those in current practice, White et al. designed a single blind parallel group cluster RCT; however, the results have not yet been published [54]. Vasudev et al. [55] introduced a single A4 physical health monitoring sheet in the chart of patients of a 15 bed male medium secure forensic psychiatric rehabilitation unit. Nurses and junior doctors completed this chart every 6 months. After one year, re-audit showed that 100% of the patient records reported up-to-date information on monitoring sheets. Moreover, it was observed that the introduction of the monitoring sheet prompted the prescription of hypolipidaemic drugs. Rosenbaum [56] included waist circumference as a routine measure to assess during admission to a psychiatric inpatient unit. An audit based on psychiatric nurses practice was performed thereafter. The authors provided 20 min of educational training and created a blank space slot for the registration of waist circumference (WC) measurement in the patient file completed by nurses at admission. This economic and relatively simple intervention led to an increase of WC measurement and recording from 0% to 58% within 12 weeks, with a 'persisting' effect on clinical practice even after 9 months from the time of the educational intervention.

Finally, work on the implementation of metabolic screening pop-up alert in the computerised physician order entry system was carried out by DelMonte et al. for people taking SGAs after the admission to a 22 bed general psychiatric unit [57]. Despite this, implementation was quite successful (for instance the availability of data regarding fasting glucose and lipid levels increased from 12.9% to 47.8%), but overall physical health monitoring remained suboptimal and incomplete: in fact, the pop-up alert takes into account only two of the six monitoring parameters recommended by the 2004 ADA consensus guideline recommendations for people taking SGAs.

Discussion

Among many studies on the increased cardiovascular risk associated with poor physical health in people affected by SMI, only a few focus on the assessment and intervention programs. Despite the great concern expressed by the scientific community regarding the need to monitor physical health in young people affected by a severe mental illness at the earliest, only 3 studies have been published to date on this issue i; however, strategies adopted in Mental Health Services for people affected by SMI can be adapted to FEP users.

There are few studies on the increased cardiovascular risk associated with poor physical health in people affected by SMI, and research to evaluate assessment and intervention programs is needed. Despite the great concern expressed by the scientific community regarding the need to monitor early physical health in young people affected by a severe mental illness, only 3 studies have been published to date on this issue in FEP; however, strategies adopted in Mental Health Services for people affected by SMI can be adapted to FEP users.

The majority of the studies reviewed focused on outpatient community services, while only 3 addressed the problem of physical health in the context of psychiatric inpatient units [55-57]. Inpatient admission represents a valuable opportunity to register baseline anthropometric and metabolic data since patients experiencing FEP are still drug naïve. In fact, despite the wider availability of specialised community mental health services, patients through FEP tend to have their first contact with psychiatric service thorough emergences services (emergency room in the general hospital, inpatient unit, crisis team) [58 59], and 63% to 81% of patients with FEP require hospitalisation for treatment [59-63]. While some studies have shown that obesity and insulin resistance might already be present in people at FEP [34 64-68], it is also evident that these problems can accelerate rapidly after starting antipsychotic treatment [20 68]: laboratory tests performed during the initial hospital admission could be subsequently shared with community mental health professionals and GPs in order to monitor and track changes and to make ad hoc, individualised interventions when necessary, e.g. start hypoglycaemic medications, switch antipsychotics etc.

The diffusion of smartphone usage offers new potentials for medical applications that could help clinical decisions, reduce errors and increase overall quality of care [69]. However, only two studies implemented either a metabolic screening bundle template in the electronic medical records [49] or a metabolic screening pop-up alert in the computerised physician order entry system [57]. Both strategies appeared feasible and effective in increasing the screening for physical health in people affected by SMI. This approach is potentially user friendly both for patients, especially younger patients who are more familiar with mobile apps, and for clinicians using apps or alarm as a mandatory reminder for scheduling lab tests or physical check. On the other hand, the traditional invitation letter adopted by two studies [44 48] highlighted potential barriers: it was observed that the letter addressed to the GP was more effective when it was mandatory for the nurses to send it out, coinciding with GPs being rewarded for maintaining a registry of people with SMI, a factor likely to have increased adherence to the physical health check by GPs. A barrier to the effectiveness of the letter addressed to the patient could be related to illness factors, such as the letter provoking undue suspicion or anxiety in the patient in response to an invitation to undergo physical examination or laboratory tests, particularly in the acute phase of the illness [70]. Other barriers might include ease of making appointments, lack of familiarity with the health practitioner and delayed appointments in noisy waiting areas [71 72]. Moreover, younger patients may already be ambivalent to health checks [73]; this observation is particularly relevant to people experiencing FEP, mostly adolescents and young adults between 15 and 25 years old, and is worthy of careful consideration by clinicians and service planners. In this regard, a SMS and email reminder was found to be effective in improving adherence to treatment in young people affected by type 1 Diabetes [74 75].

In five studies, a paper chart was attached to patient medical records [43 55 53 56], improving screening for metabolic disturbances in all cases. However, data on cardiovascular risk factor vary substantially, remaining suboptimal in few cases [47 56] as shown in Table II. Electronic pop-ups could potentially be more effective in reminding clinicians and nurses to perform a physical check. However, they usually require time and additional funds for community mental health services. Meanwhile, a paper sheet algorithm could be a user-friendly instrument to share with GPs, facilitating communication between clinicians and enabling them to improve their holistic approach. Prompts to patients and their families to request the application of the algorithm is another way to reinforce adherence and is currently being utilised in the implementation of the Lester UK version of the Australian Positive Cardiometabolic Health Algorithm [43 76].

An audit approach was adopted in 6 of 14 studies, with the specific intention to improve the quality of care in the outpatient services. The majority of the audits were supported by educational intervention targeted at mental health professionals nurses [42 50], psychiatrist residents [47 49], general practitioners [44 48], service changes and provision of monitoring equipment [42 56], but rarely scheduled supervisions [50]. Despite the general opinion that educational intervention directed to specialised nurses is crucial to

get positive results, no evidence has been reported [77] supporting a correlation between that intervention and clinical outcome; thus, evidence based educational interventions are needed to change misconceptions and attitudes of mental health professionals and providers to improve the overall service.

The majority of the studies reviewed reported strategies to improve metabolic screening and intervention to be performed exclusively by mental health professionals, with only a few exceptions [41 42 44 52]. This could explain, at least in part, why screening was suboptimal in the majority of cases and why it was rarely followed by adequate interventions, as already reported by Cahn et al. [30] and De Hert et al. [7]. Clinicians often complain of obstacles preventing adequate implementation of physical health checks in routine practice. These include lack of basic equipment to perform physical assessments [78], poor information technology support for recording and sharing laboratory investigations, being overwhelmed with emergencies in a time-limited consultation setting and lack of sufficient training or skills to provide a holistic intervention [79]. An integrated approach with general practitioners, as reported by Curtis [43], Vasudev [44] and Hardy [48], could be an effective strategy to overcome the above barriers and improve routine care. However, in any integrated approach clinical accountability should be clear. NICE [80] recommends that mental health services take lead responsibility for physical health monitoring in the first 12 months following initiation of antipsychotic medication, and that lead responsibility may shift to primary care thereafter. The algorithm developed by Curtis et al. [43] may be a useful instrument in clinical practice, evidence-based and offer a simple framework of what should be measured and actions to consider if problems are detected. Scaled up to national level, the Lester UK Adaptation provides the core monitoring instrument of a National Commissioning for Quality and Innovation initiative to financially incentivise mental health services to improve physical health monitoring (NHSE CQUIN 2014/15 guidance). Moreover, after reviewing all the instruments adopted in various clinical settings, the Algorithm first published by Curtis in Australia seemed the most complete regarding physical health data collected, as shown in Table II; it is easy to apply in real world settings, as shown by its implementation in Australia, UK, Canada and Japan (www.iphys.org.au), and designed to be shared with GPs. In consideration of the above data, an Italian adaptation of the Curtis et al. Positive Cardiometabolic Health Algorithm [43] has been produced (Appendix). Further improvements could potentially be gained if the clinical algorithm is implemented in an electronic format and with pop-up alerts for timely administration.

TABLE II.
Data collected in studies reviewed regarding cardiovascular risk factors. *Dati clinici riguardanti fattori di rischio cardiovascolare inclusi negli studi identificati.*

First author, Year	Metabolic syndrome					SMOKING STATUS	EXERCISE	OTHER
	GLU	LIP	WC	BMI	BP			
Curtis, 2012	✓	✓	✓	✓	✓	✓	✓	Polycystic ovary syndrome, lifestyle
Delmonte, 2012	✓	✓	NA	NA	✓	NA	NA	Weight
Gonzales, 2010	✓	NA	NA	NA	✓	NA	NA	FBC, urea, electrolytes, liver and thyroid function, prolactin, Hb_2Ac, weight
Rosenbaum, 2014	NA	NA	✓	✓	✓	✓	NA	NA
Shuel, 2010	✓	✓	NA	✓	NA	✓	✓	Pulse, temperature, liver function, cervical smear, diet, safe sex, sleep, dental health, breast check, testicle and prostate self examination, menstrual cycle, teeth, eyes, feet, bowels, urine, cannabis and caffeine use.
Thompson, 2011	✓	✓	✓	✓	✓	✓	✓	NA
Vasudev, 2010	✓	✓	✓	✓	✓	✓	NA	FBC, CV RISK, ECG, alcohol intake
Wiechers, 2012	✓	✓	NA	✓	✓	NA	NA	NA
Wilson, 2014	✓	✓	✓	✓	✓	✓	✓	Alcohol intake

GLU: blood glucose, LIP: blood lipids (total cholesterol, LDL-cholesterol, HDL-cholesterol), WC: waist circumference, BMI: body mass index, BP: blood pressure, NA: not available, FBC: full blood count, CV: cardiovascular, ECG: electrocardiogram

The current review has some limitations: the first is the paucity of data regarding specific strategies to implement physical health monitoring in people affected by FEP. Despite clear evidence that cardiometabolic risk appears early and that the best predictor for long-term weight gain is an increase of more than 5% after one month of psychopharmacological treatment [81], at least due in part to the direct consequence of prescribed antipsychotic medication [82], monitoring and intervention for physical health in people affected by FEP is still suboptimal and varies significantly across countries. Among the reasons for the lack of systematic approach to physical health monitoring and intervention in FEP, several factors should be considered to play a key role: the diversity of methods adopted, absence of RCTs on this topic and lack of instruments adapted to a population that is often younger than average users with SMI, and sometimes difficult to engage in treatment [83].

Alongside the above-mentioned difficulties to adapt strategies for people affected by SMI to monitor physical health in FEP, several barriers to access healthcare for people with a SMI have also been identified. Many authors reported inequalities for access in care [7 84] in people affected by SMI. Barriers to physical health care are perceived by patients and healthcare staff across all steps of healthcare delivery [71], including: a) identification of health problems [71 72 85 86], b) reaching healthcare services [72 85 87], c) financial problems [88] d) health care professionals work overload [89] and e) follow-up to identified physical health problem [78 85 86 89].

The small number of reported studies underlines the large gap between the spread of guidelines that reflects the need of monitoring physical health in people affected by SMI, and the barriers emerging in mental health services to implement new strategies in clinical practice.

Improving care of physical health is a pressing need for patients affected by FEP [82]. No monitoring is unethical, risky and then unacceptable. Effective intervention is provided by a multidisciplinary team led by psychiatrists but requires a close communication between mental health services and the primary care physician. The combination of creative approaches and already established evidence-based practices borrowed from other medical fields [90 91], with the introduction of innovative technologies suitable to reach younger patients, will contribute to improving the overall quality of mental health services.

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Conflict of interests

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Membership of the current NICE quality standard group for children and adolescents affected by bipolar disorder, psychosis and schizophrenia; Board member of the National Collaborating Centre for Mental Health (NCCMH); Member of the Expert Reference group of NICE Better Access to Early Intervention for Psychosis Services by 2020; Clinical Advisor (paid consultancy basis) to National Audit of Schizophrenia (NAS). These are my personal views and not those of NICE, NCCMH or NAS.
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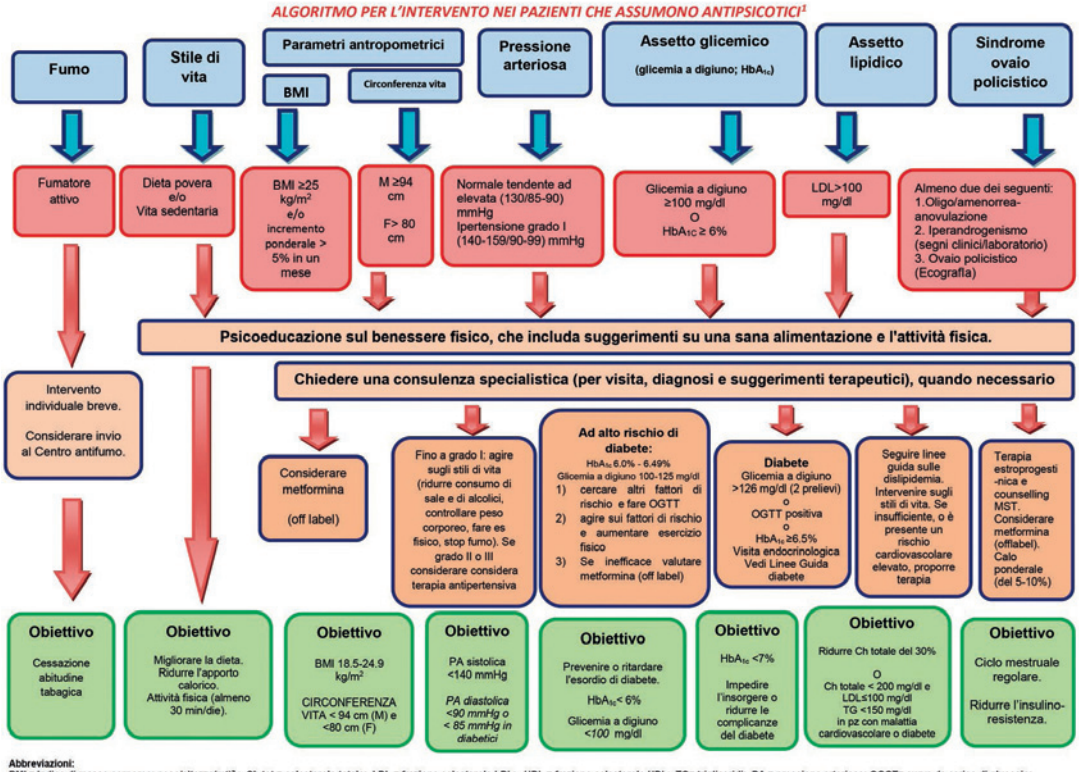
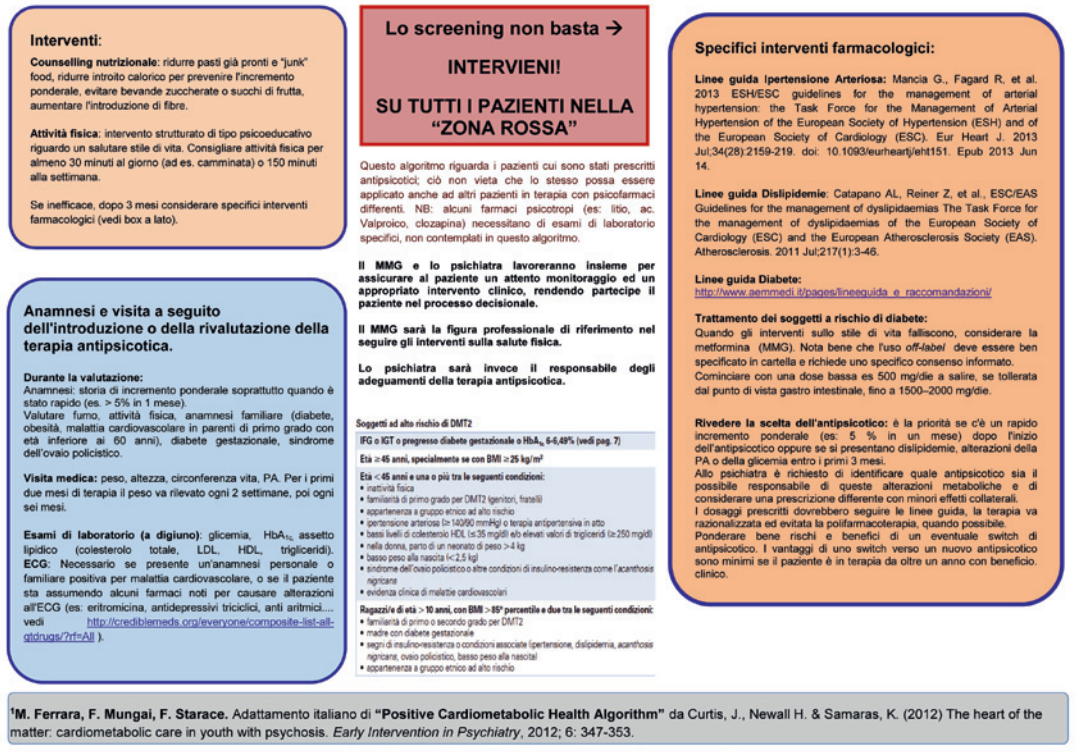
Appendix





[1]**M. Ferrara, F. Mungai, F. Starace.** Adattamento italiano di **"Positive Cardiometabolic Health Algorithm"** da Curtis, J., Newall H. & Samaras, K. (2012) The heart of the matter: cardiometabolic care in youth with psychosis. *Early Intervention in Psychiatry*, 2012; 6: 347-353.