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APPLICATION OF DISCRETE-EVENT SIMULATION FOR PLANNING AND OPERATIONS ISSUES IN MENTAL HEALTHCARE

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ABSTRACT

Mental health disorders are on the rise around the world. Inadequate service provision and lack of access have led to wide gaps between the need for treatment and service delivery. Despite the popularity of Discrete-event Simulation (DES) in healthcare planning and operations, there is evidence of limited application of DES in planning for mental healthcare services. This paper identifies and reviews all the papers that utilize DES modelling to address planning and operations issues in mental healthcare services. The aim is to contribute a roadmap for the future application of DES in mental healthcare services, with an emphasis on planning and operations.

1 INTRODUCTION

Mental disorders are an enormous burden to society. They account for 30% of non-fatal disease burden worldwide and 10% of overall disease burden, including death and disability (Mnookin et al. 2016). In addition to the health impact, mental disorders cause a significant amount of economic burden through health spending, social spending, and through the loss of labor (World Health Organization and Calouste Gulbenkian Foundation 2017). From a service planning and delivery point of view, the era of advanced deinstitutionalization brings with it significant challenges to provide high-quality coordinate care (OECD/EU 2016). Individuals who have a varying range of health and social needs must be organized by providers of care across three settings: care provided in the community, inpatient care and secure care, in a locked setting. For healthcare professionals in mental healthcare, improving efficiency of operations by optimally allocating scarce resources and improving access to treatment while minimizing delivery costs becomes imperative to delivering high quality care.

Discrete-event simulation has long been a popular and widely accepted tool of decision support for decision-makers in healthcare operations planning, even before the widespread availability of computers and development of advanced simulation software (Papageorgiou 1978; Tunnicliffe 1980; Günal and Pidd 2010). Despite its popularity, there is evidence of limited application of DES (six papers have been found) in operations planning for Mental Healthcare Services (MHSs) (Long and Meadows 2018). This knowledge gap warrants attention as DES has the potential to analyze and improve health services (Jacobson et al. 2013). We conducted a systematic review to determine the extent to which studies have used DES within MHSs. This paper builds on the review by Long and Meadows (2018) by contributing additional insights and a tailored roadmap for the future application of DES for planning and operations issues in Mental Healthcare (MH).

This paper is organized into a further five sections. Section 2 provides an overview of background literature on MH and simulation modelling in MHSs. Section 3 describes the search methodology employed for the literature review. Section 4 offers an analysis and description of findings from the articles chosen to be reviewed. Section 5 discusses the future research directions for the application of DES in MH. Section 6 concludes this paper.

2 BACKGROUND LITERATURE

2.1 Mental Healthcare Services

Mental disorders often follow a chronic course, albeit with periods of relapse and remission which can mimic acute disorders. Management of mental disorders- more particularly than other medical conditions- is said to require a balanced combination of three fundamental ingredients of care: pharmacological; psychological; and psychosocial interventions (World Health Organization 2001). Therefore, the needs of people with mental illness are multiple and varied and differ at different stages of the illness. These needs are met mainly through community-based services within a local setting. Community mental health can comprise of a variety of services such as outpatient services, acute inpatient services, long-term care, nursing services, mental health teams, therapy services, and community hospitals in co-ordination with a number of external partners including primary care, specialist care, social care, voluntary services, emergency services, education, housing, and the justice system (Thornicroft et al. 2016; Carter 2018).

From an operational aspect, there is little uniformity in the delivery of services (Carter 2018). It has been reported that in a single geographical location no two mental health service providers deliver the same set of services (Carter 2018). This discord between how services are structured is both a global and national phenomenon. Patterns of services and provision of treatment for mental health not only differ between high- vs. low- and middle income countries, but also high- vs. low-resource areas within countries (Patel et al. 2018). A single global model of mental health care provision simply does not exist (Thornicroft et al. 2016).

Additionally, a range of barriers limit the provision of care specifically for the MH sector, which include inadequate funding, high workload pressure on mental health workers, and understaffing among others (BMA 2017). For patients with mental health conditions, there remain a number of system-wide challenges. These include, long waiting times, poor integration across services, bed shortages and inadequate service provision, to name a few (BMA 2017). With rising healthcare costs and continued prevalence of mental health disorders worldwide, the need to make comprehensive decisions in service delivery and for robust resource allocation add to the ever-increasing pressure to deliver quality care. The mental healthcare system consists of multiple stakeholders, inter-related and interconnected components, with complex interactions. Hence, OR techniques such as DES, can and should play a significant role in helping MH service managers to evaluate efficiency of existing systems, examine staffing levels, and investigate complex relationships in the system.

2.2 Simulation in Mental Healthcare

A number of reviews published in the timeframe 2009-2019, have explored the application of DES in a wide array of healthcare settings (Brailsford et al. 2009; Cardoen et al. 2010; Günal and Pidd. 2010; Mustafee et al. 2010; Katsaliaki and Mustafee 2011; Fakhimi and Mustafee 2012; Mielczarek and Uziałko-Mydlikowska 2012; Mielczarek 2016; Long and Meadows 2018). In striking contrast, analysis of these reviews reveals that prior to the review authored by Long and Meadows (2018), the paper by authors Mielczarek and Uziałko-Mydlikowska (2012) was the only one that cited a study related to mental health.

MHS planning has been largely neglected by the discipline of Operations Research (OR), which by extension also holds true for DES (Bradley et al. 2017). A similar conclusion was arrived at by authors Long and Meadows (2018), having reviewed 160 papers that employed simulation modeling methods such as Markov modelling; Monte Carlo Simulation; Microsimulation; DES; Agent Based Modelling (ABM); and System Dynamics (SD) in mental healthcare. The authors found widespread applications in areas of medical decision making and epidemiology. However, application of simulation in healthcare system design, planning and operations were found to be relatively underrepresented (Long and Meadows 2018). Furthermore, the authors identified 19 articles that applied DES, of which four journal articles, one conference proceedings paper and one PhD thesis applied DES to address planning and operations issues in MHSs. The application of ABM and SD to inform mental health policy has also been reviewed by authors Langellier et al. (2019). They provide a narrative synthesis of eight articles included in their review and highlight opportunities for expanded use of complex systems approaches in mental healthcare (Langellier et al. 2019). Along similar lines, this paper aims to further contribute to the budding literature in MHS planning by reviewing and analyzing literature specific to the application of discrete-event simulation.

3 SEARCH STRATEGY AND METHODOLOGY

We conducted a systematic review of literature to identify studies that utilized DES within MHSs. We retrieved relevant studies from a number of databases. The search strategy was designed to capture publications not only from OR journals but also to include articles from medical journals. The search term utilized was "discrete-event simulation" AND "mental health*". Articles published between 2000 and 2018 were included. Figure 1 summarizes the search strategy employed for selecting articles (Liberati et al. 2009). The selection procedure included two screenings to determine the eligibility of the articles. In the first screening, articles were included if the answer to the questions: (i) has DES been applied; and (ii) has DES been applied to MHS was affirmative. Those excluded from the analysis were articles that were reviews, opinion pieces, debates and methodology focused papers. Furthermore, articles' whose primary focus was to model epidemiology, disease progressing, screening, health promotions and hospital overcrowding where mental health clinics were not a key focus were also excluded. In the second round of screening, articles were excluded if they primarily dealt with health economics. Following screening, ten papers were selected for review. Data extracted for each paper is presented in Table 1.

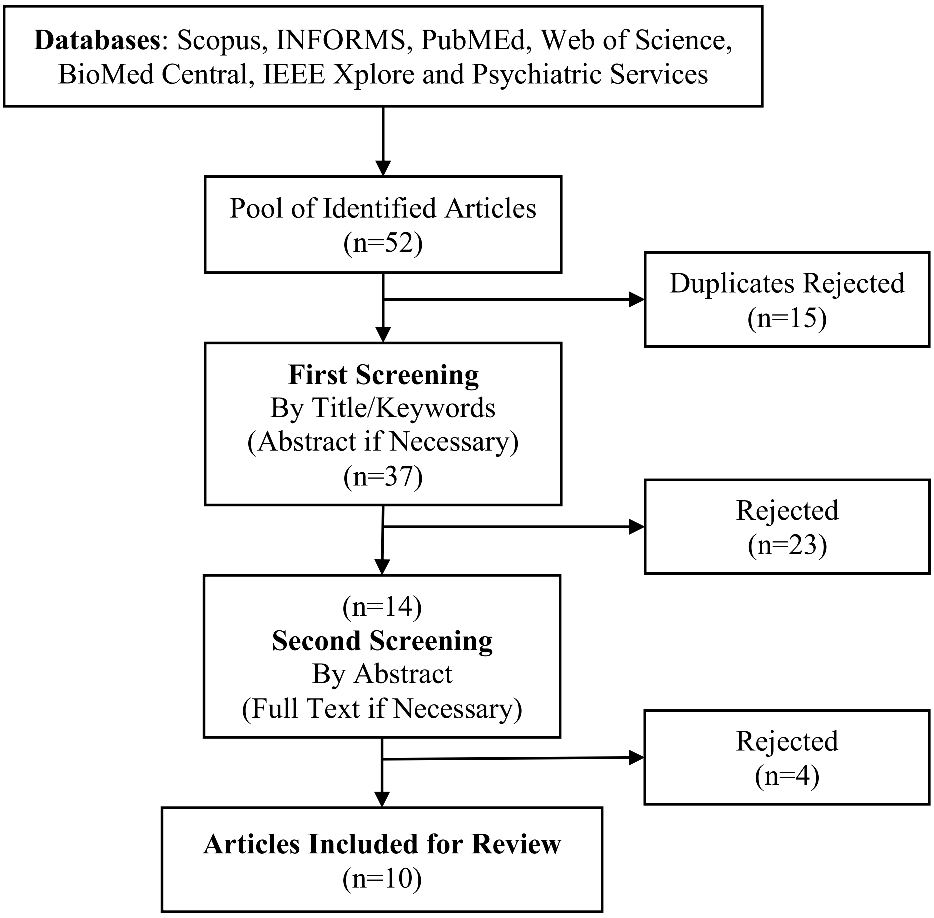

Figure 1: Flow diagram of review paper selection.

Table 1: Summary of classification of review articles.

Title and Authors	Purpose	Modelling Scope	Stakeholder Engagement	Implementation	Model's Input Parameters	Study Findings
Kuno et al. (2005)	Capacity Planning	Multi-Unit (Hospital and Residential Units)	✘	Suggested	▪ Length of Stay (LoS). ▪ Bed capacity ▪ Transition rate (between facilities).	▪ Comparison of various bed capacity options. ▪ Increased bed capacity improved system performance.
Patten and Meadows (2009)	Capacity Planning and Patient Demand	Service Network	✘	Suggested	▪ Population size. ▪ Treatment acceptability rate. ▪ Recurrence rate.	▪ Linked epidemiology data to service planning. ▪ Estimated number of therapists required.
Dursun et al. (2013)	Capacity Planning	Single Unit (Clinic)	✓	Conceptualized	▪ Panel size ▪ Treatment engagement (%)	▪ The number of patients a psychiatrist should provide care to was identified.
Kim et al. (2013)	Service Redesign and Resource Allocation	Single Unit (Clinic)	✓	Conceptualized	▪ Clinical hours. ▪ Staff composition.	▪ Analysis of trade-offs between long service time and increasing staffing costs. ▪ Extending clinic hours by two and an additional psychiatrist were recommended.
La et al. (2016)	Capacity Planning	Single Unit (Hospital)	✓	Conceptualized	▪ Bed capacity.	▪ A 165% increase in bed capacity required to reduce patient wait time. ▪ Emphasized DES's potential to solve complex operational problems in MH.
Troy et al. (2017)	Resource Allocation and Budgetary Evaluation	Service Network	✓	Conceptualized	▪ Staff composition ▪ Clinic location	▪ Experimentation revealed underutilized staff that were reallocated. ▪ Rationalized staffing levels and improved service levels.
Konrad et al. (2017)	Resource Allocation	Multi-Unit (Integrated Clinic)	✓	Conceptualized	▪ Patient volumes	▪ Expanding patient coverage required four additional providers. ▪ Inform the MH community to the benefits of DES.

Title and Authors	Purpose	Modelling Scope	Stakeholder Engagement	Implementation	Model's Input Parameters	Study Findings
Chepenik and Pinker (2017)	Resource Allocation	Single Unit (Psychiatric Emergency Service)	✗	Conceptualized	▪ Number of practitioners	▪ Modest addition of one half-time clinician produced biggest increase in patient flow metrics. ▪ Explained service bottlenecks
Paton and Tiffin (2018)	Capacity Planning	Single Unit (Clinic)	✗	Suggested	▪ Referral rate. ▪ LoS.	▪ Substantial increase in in-patient capacity needed to reduce wait times. ▪ Call for a more complex approach within DES framework.
Roh et al. (2018)	Capacity Planning	Multi-Unit (Hospital ED and Inpatient Wards)	✓	Conceptualized	▪ Patient arrival rate ▪ ED inpatient admissions (%) ▪ Inpatient LoS (%)	▪ Boarding time increase with high arrival rates and LoS. ▪ Over-utilized inpatient units push urgent care for MH into the emergency department.

4 RESULTS

4.1 Publication Characteristics

A total of ten publications were retrieved dating from 2000 to 2018 of which seven were published in journals and three were conference publications. Interestingly, of the seven journal publications, only one was from an Operations Research journal and six were from non-OR journals. Additionally, majority of publications were from the USA (seven papers), with Australia, Canada and UK constituting for one paper each.

4.2 Study Objectives

We categorized six papers as being predominantly concerned with capacity planning whilst four papers featured resource allocation issues. Studies focused on capacity planning largely involved increasing bed capacity to understand potential impacts on patient flow through the system (Kuno et al. 2005; La et al. 2016; Paton and Tiffin 2018; Roh et al. 2018). Furthermore, two studies examined capacity in terms of prospective requirement of practitioners to satisfy patient demand for a service (Patten and Meadows 2009) and investigated the optimum panel size (list of assigned patients) for a psychiatrist providing treatment to Post Traumatic Stress Disorder (PTSD) patients (Dursun et al. 2013). The lack of beds in mental healthcare services is a contentious issue where service providers have to find tradeoffs between increasing health outcomes for patients by decreasing waiting times and costs associated with increasing bed capacity. Especially when delay in treatment poses considerable health risks (e.g. suicidal ideation and violent behavior) to patients with mental health conditions.

Resource allocation is the second most investigated issue in MHS planning, wherein authors Konrad et al. (2017) have explored the impact of projected increase in patient volumes on resources, whilst authors Chepenik and Pinker (2017) developed a model to predict potential benefits of additional clinical staff to patient flow. Resource allocation has also been conducted along with rationalizing budgets for MHSs (Troy et al. 2017) and to improve service (Kim et al. 2013).

Most studies reviewed in this paper have marked the beginning of DES in various aspects of MHSs, for instance: authors Konrad et al. (2017) have modelled an integrated clinic, thereby addressing a gap in simulation as well as in mental health; Troy et al. (2017) have applied simulation on a granular level for a large mental healthcare network for resource allocation; Dursun et al. (2013) used DES to design a panel (list of assigned patients) for a psychiatrist, a phenomenon commonly only associated with physicians in primary care; Roh et al. (2018) have addressed a gap in literature by considering the transition process for patients from an emergency department into external community and inpatient settings; and Patten and Meadows (2009) have demonstrated how service planning can be conducted by utilizing epidemiologic data.

Clearly, all of the papers are primarily motivated by improving the quality of services being studied and demonstrating the utility of DES in mental health as opposed to enhancing the DES method and models.

4.3 Modelling Scope and Model Type

Scope represents the extent to which the MH system has been captured in models. Five articles under review were modelled on a single unit (such as MH clinics, Hospitals, Psychiatric Emergency Services) and four articles modelled multiple units in the MHS network (e.g. hospitals, residential units and inpatient wards).

Additionally, DES models have broadly been classified into four types based on the purpose they serve. Based on this classification, models developed in eight of the ten articles were grouped as ‘Throwaway Models’, that is, models that are developed for the duration of a study to investigate one or more issues that are being address (Robinson 2014). In contrast, models from the two remaining studies were classified as “Generic Models”, that is models developed in a particular context that can be used across a number of organizations (Robinson 2014). Thus, the service planning model linking epidemiology data to service planning developed by authors Patten and Meadows (2009) and the model built by Troy et al. (2017), to rationalize staffing levels were generic models that could potentially be applied across organization in the context of MH.

4.4 Stakeholder Engagement and Implementation

Stakeholder engagement is said to play a key role in the success of a simulation project (Robinson and Pidd 1998). Six out of ten papers from this review describe varying degrees of stakeholder engagement. The paper that described a relatively high stakeholder engagement was authored by La et al. (2016). They describe the number of stakeholders that participated and enumerate on who the stakeholders were while stating reasons for their involvement. A total of nine meetings were held at various points in the study. These allowed for goal communication and data collection as well as conceptualizing scenarios for analysis. Likewise, authors Konrad et al. (2017) have described adequate levels of stakeholder engagement with staff for a number of purposes including, data collection, conceptual model validation, base scenario modelling and incorporating feedback via a number of model iterations. On the other hand modest levels of engagement have been described by authors Dursun et al. (2013), Kim et al. (2013), Troy et al. (2017) and Roh et al. (2018), typically through model validation, reviewing model’s results, and interviews to quantify service parameters, validation of model’s assumptions and for conceptualizing service changes.

Moreover, the nature of stakeholder engagement varies across studies. That is, we deduced from the description of the engagement that La et al. (2016) engaged with stakeholders in a group, while other authors engaged on a one-on-one basis (Dursun et al. 2013; Konrad et al. 2017; Roh et al. 2018). However, for authors Kim et al. (2013) and Troy et al. (2017), we were unable to deduce the nature of stakeholder engagement owing to the lack of a detailed description.

None of the papers being reviewed reported the use of their models in practice. This is in line with previous findings (Wilson 1981; Taylor et al. 2009). The papers were classified based on the three-level scale of implementation described by Brailsford et al. (2009). Accordingly, seven studies have ‘conceptualized’ (discussed with a client organization) their model’s results by describing the likelihood for improvement in services, if utilized. On the other hand, three studies have ‘suggested’ (theoretically proposed by authors) their model’s usefulness, specifically in the context of MHS.

4.4.1 Sponsor and Funding

The primary initiator (sponsor) of seven of these studies was the health services, although sources of funding for these studies were not reported. Furthermore, one study was judged to be solely of academic origin, although the authors utilize data that was consolidated by the government, the study itself was an academic venture (Patten and Meadows 2009).

Moreover, we found evidence of two studies that were sponsored and funded by government initiation/support via grants and/or by health services. Specifically, the study conducted by Kuno et al. (2005) was government funded and the study conducted by La et al. (2016) had elements of funding and support from government as well as health services. While the number of articles being analyzed here is modest to come to a conclusion, it is however, indicative of a possible recognition from the mental health community and to some extent, the government of DES modelling's offerings. In support of this argument, Konrad et al. (2019) have highlighted the coming together of academics and clinicians in their study as having been successful in applying DES, which is not typically used in mental health workforce planning and have advocated for more such partnerships across mental health settings. Perhaps, future research can look to this study for academic-clinical partnerships in the context of mental health.

5 DISCUSSION

The previous section illustrates the underrepresentation of DES in operations and planning of MHSs. The papers reviewed so far have made a case for robust application of DES to the mental health community as well as to researchers and practitioners alike. Having said that, the application of simulation modelling to MHSs is anything but straightforward. The structural ambiguity of mental health service provision highlighted in section 1.1 poses significant challenges to model transferability and adaptability. However, certain contextual and structural similarities can be drawn from application of simulation to social care (Onggo 2012); stroke care systems (Churilov and Donnan 2012); and long-term care (Patrick et al. 2015). Each of these care systems consists of a diverse range of disparate services, which constitute interrelated parts of a whole system. Notwithstanding these similarities, it is important to recognize that mental healthcare services encompass elements of acute care, chronic care, social care and long-term care, which makes direct reapplication of previous research a matter of further inquiry.

This section will draw on existing literature of DES and its application in healthcare, while examining the potential for reapplication or adaptation to aspects of MHSs. The subsequent roadmap has been conceived by carefully considering the complex dynamics within the system, while also acknowledging the characteristics of the MHSs discussed in the review. Besides, the roadmap is also consistent with emerging trends in modelling healthcare systems (Arisha and Rashwan 2016).

5.1 Operational Efficiency

Variations across mental health services have had a negative impact on workforce productivity, operational efficiency while adding to the escalating mental health related costs (Lagomasino 2010). According to the analysis presented in section 4, most studies have primarily focused on capacity planning and resource allocation. In contrast, only one study focused on service design. Whereas, DES has been utilized for these purposes in other areas of healthcare (Mustafee et al. 2010), such applications in mental health are negligible. For instance, DES has been used to evaluate service design options for stroke care pathways to determine the most effective alternative that reduces in-hospital delays (Monks et al. 2012); and DES was used to design a more efficient hospital pharmacy by comparing changes in staffing levels and skill-mix depending on workload (Reynolds 2011). Such evidence-informed analysis of service design and delivery alternatives, have the potential to improve outcomes and cut costs (Pitt 2016). Future research could focus on this aspect of MHSs as care pathways of mental health patients are highly variable. This is especially important as patients with mental health disorders present with considerable risks and poor quality of treatment can lead to poor outcomes (Gilburt 2015).

Length of Stay (LoS) has been a key performance indicator that most studies have tried to reduce owing to the financial constraints of increasing bed capacities. Lack of care in the community and decreasing provision of social care are said to prolong LoS (Paton and Tiffin 2018). However, such influences have not been modelled or studied and can be a promising area of future research.

5.1.1 Quality Improvement

In response to huge pressures due to severe financial constraint and workforce shortage facing MHSs, a growing number are turning to 'quality improvement' (QI) approaches to achieve service improvements (Green et al. 2012; Ross and Naylor 2017). QI tools include, 'Plan-Do-Study-Act Cycle'; Six-Sigma; Lean methodology etc. (Varkey et al. 2007). In essence, these efforts proceed on the basis of anecdotal accounts of successful strategies and require multiple iterations to attain reliable improvements, which are likely to incur additional costs. Although such efforts in mental healthcare services are in their early days, there is limited evidence of impact (Ross and Naylor 2017).

Alternatively, evidence in simulation literature demonstrates the potential for DES and QI as complementary methodologies that can be used together as they have similar motivations: to improve process and service delivery (Robinson et al. 2012). Indeed, the integration of DES and QI has also been advocated for by the medical community as well (Rutberg et al. 2015) and there exist a number of instances in literature where such efforts have been successfully employed in healthcare (Robinson et al. 2012; Baril et al. 2016). This integration can help an already financially constrained mental health service in selecting the best option of service improvement by using DES, without having to dissipate precious resources.

5.2 Stakeholder Engagement

In MH, delays in decision making on improvements to patient pathways owing to stakeholder concerns and feedback, have been known to have substantial impacts on costs and patients' health (Carter 2018). From the analysis in section 4.4, it appears that most papers have given limited attention to stakeholder engagement in terms of identifying relevant stakeholders, describing their level of decision-making or involving them explicitly from the outset of the study. The fragmented nature of MHSs across different local areas and the presence of a range of partners and stakeholders warrants cooperation and integration, to achieve long-term efficiency and greater operational productivity (Carter 2018). Therefore, future research offers ample opportunities to improve limitations of stakeholder engagement so far and enhance stakeholder engagement in the application of DES to MHSs. This could not only be beneficial to improving a DES models' quality and with it, the chance of a successful outcome, it could also help MHS providers and decision makers tackle some of their productivity issues.

Stakeholder engagement is considered a key factor in simulation studies, and is critical to successful model implementation (Young et al. 2009). There is evidence of a direct causal link between weak or low stakeholder engagement and lack of implementation. Early involvement of stakeholders is often recommended for a simulation study. This is truer so in health care than in other areas of application as it increases the risk of loss of interest in the final results and recommendations (Roberts 2011). Furthermore, it is also suggested to involve a diverse group of stakeholders whose interests add an additional dimension to a simulation study (Roberts 2011).

In literature, there are instances of simulation studies that utilize Problem Structuring Methods (PSMs) for stakeholder engagement through facilitated modelling (Kotiadis et al. 2014; Robinson et al. 2014; Tako and Kotiadis 2015). Interestingly, PSMs are already being applied within mental health for systems improvement and policy (Powell and Mustafee, 2017). Future research could use PSMs in combination with DES through facilitated modelling in MH.

5.3 Methodological Pluralism

Several aspects of mental health services that need further investigation have been identified by the studies that have been reviewed here. Most authors recognize the preliminary nature of their application and call for a more comprehensive approach.

The dynamic structure of MHSs, often generates a number of inefficiencies at boundaries between different services and service providers in the system (Carter 2018). Therefore focusing on the wider mental healthcare continuum by modelling service integration and examining the interdependencies in the system could be a promising future research direction. For instance, service use by patients with mental illness is associated with habitual no-shows, which has a negative effects on both the patient and the service (Gondolf 2009). Such analyses have not been incorporated into simulation models of MHSs so far. Although, statistical analysis of such factors is usually conducted on a standalone basis (Crabb and Hunsley 2006). Coupling statistical analysis of demand factors such as age, gender, ethnicity with DES modelling could provide invaluable insight into the operational dynamics associated with them.

Additionally, service improvements in MHSs are currently being carried out without thoroughly analyzing the impacts of implemented changes (Ross and Naylor 2017). It is also reported that these improvements are being carried out in isolation or in single units (Gilburt 2015). The combination of such practices can be detrimental to MHSs that are under immense pressure. Increasingly in healthcare, similar issues are being tackled by acknowledging that it is rarely possible to capture multiple aspects of a problem, and by employing hybrid simulation by combining two or more simulation methods such as DES, system dynamics (SD) and agent-based modelling (ABM) for one intervention (Brailsford et al. 2018). Indeed such advantages of hybrid simulation are progressively being discussed in literature while also being used to explore links between health and social care systems (Brailsford et al. 2013). Moreover, similar inquiries can also be found in mental healthcare, wherein hybrid simulation has been used for cost-effectiveness analysis of integrating mental health into primary care (Aringhieri et al. 2018). By further adapting approaches that address multiple aspects of service delivery in MH, current limitation could be overcome.

Furthermore, under the current system wide financial constraints facing MHSs, resource planning is essential to deliver quality care (Dunn et al. 2016). Increasingly, simulation-optimization approaches are being used for identifying effective improvement factors in planning healthcare service resources (Fu et al. 2015). Simulation methods such as DES can be employed to model critical activities and scarce resources and optimization methods such as linear programming can be used to provide optimal resource configurations that best improve performance. For instance, authors Ozcan et al. (2016) have used the simulation-optimization approach to evaluate and improve the performance of a surgery-based pathway. Simulation allowed for system variability to be tracked and for the evaluation of resource utilization. Whereas, optimization allowed for the identification of optimal capacity decisions in delivering performance. This integration of simulation and optimization could be another interesting area of future research.

6 CONCLUSION

Mental illness is the next major global health challenge. Worldwide, there is widespread commitment to fill the gaps between the need for treatment and service delivery. Operations and service planning issues in mental healthcare present plenty of opportunities for researchers as well as practitioners, not only for the application of DES, but also for combining DES with other suitable methods that capture multiple aspects of the service delivery system. Our review analyzes the application of DES modelling for planning and operations issues in mental healthcare services so far. The analysis highlights several limitations and contributes a roadmap for the application of DES to tackle issues of operational efficiency and productivity in MHSs. We encourage simulation researchers to direct their efforts towards tackling operations and planning of MHSs. This could be a step in the right direction towards addressing important problems faced by mental healthcare.

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